Exhibit No. 202

OPC – Exhibit 202
SPP Solar and Wind ELCC Accredidation
File No. EA-2022-0328

Solar and Wind ELCC Accreditation

August 2019

Southwest Power Pool

Revision History

Date or Version Number	Author	Change Description	Comments
August 18, 2019	Chris Haley	Wind and Solar Accreditation	Combining wind and solar accreditation policy
September 23rd , 2019	Chris Haley	Added new solar and wind study and allocation methodology	Based on member submitted policy
September 24th, 2019	Chris Haley	Added language in the SAWG meeting for ELCC Allocation Load Hours and ELCC Schedule for Implementation sections	

Table of Contents

1. Introduction

This white paper proposes a methodology for prioritizing and allocating the available effective load carrying capability (ELCC) from wind and solar generating facilities that qualify as capacity in the SPP Balancing Authority (BA). Because of wind and solar generation intermittency, the capacity value or effective load carrying capability (ELCC) of wind and solar powered resources are lower than their nameplate values and will decrease as their penetration increases across the BA. As the penetration of wind and solar generation increases, SPP and its members need to be aware of and understand the changing impact these resources have on the economics of resource adequacy and on the reliability of the system.

2. Background

Since 2004, when SPP originally adopted the criteria for the recommended methodology to evaluate the capability of wind and solar facilities, wind penetration in the SPP region has increased substantially. The current criteria has been updated once during the past 15 years, which based on the methodology shift led to most wind facilities receiving more accreditation . The current criteria accredits wind and solar without any direct consideration of the existing total penetration in the region. As the penetration of wind and solar generation, increases there may be reliability impacts that are not taken into account in the current methodology, which results in over valuing the capacity accreditation of these resources.

The Supply Adequacy Working Group (SAWG) activities within its scope document directs the SAWG to review the processes and requirements needed to maintain reliable supply adequacy in the SPP BA. One of those requirements for review is the accreditation methodology for resources. In late 2018, the SAWG directed SPP staff to review and research industry use of the Effective Load Carrying Capability (ELCC) methodology for intermittent resources. The goal was to determine if there was a reliability concern with the current criteria compared to the calculation of accreditation e based on the ELCC methodology. In 2019, SPP staff completed a system-wide wind[1] and solar[2] ELCC analysis and found that there was measureable difference in the results between the two methodologies as wind and solar penetrations increased. Due to the results of the ELCC Wind Study, the SAWG approved in March 2019, via straw poll, the use ELCC as the guiding principle for the accreditation of solar, wind and storage resources in the SPP Balancing Authority. This move to ELCC would replace the current accreditation methodology found in

[1] 2019 ELCC Wind Study Report
[2] Insert 2019 ELCC Solar Study Report here

section 7.1.6.1 (7) of the SPP Planning Criteria, once new criteria language is approved by the Market and Operations Policy Committee (MOPC).

3. **ELCC Overview**

ELCC is defined as the amount of incremental load a resource, in this case wind and solar, can dependably and reliably serve, while considering the probabilistic nature of generation shortfalls and random forced outages as driving factors to load not being served. ELCC is an industry wide accepted methodology used for determining the capacity value of resources and been in use for nearly half a century.[3]

The measurement of ELCC for both wind and solar resources is consistent as described in the following example using one wind scenario. To measure the ELCC of a particular resource, the reliability effects are isolated from other resources for the resource in question. This is accomplished by calculating the LOLE of two different cases: one with and one without the resource, as shown in Figure 1. Inherently, the case with the resource should be more reliable and consequently have fewer days per year of expected loss of load (smaller LOLE).

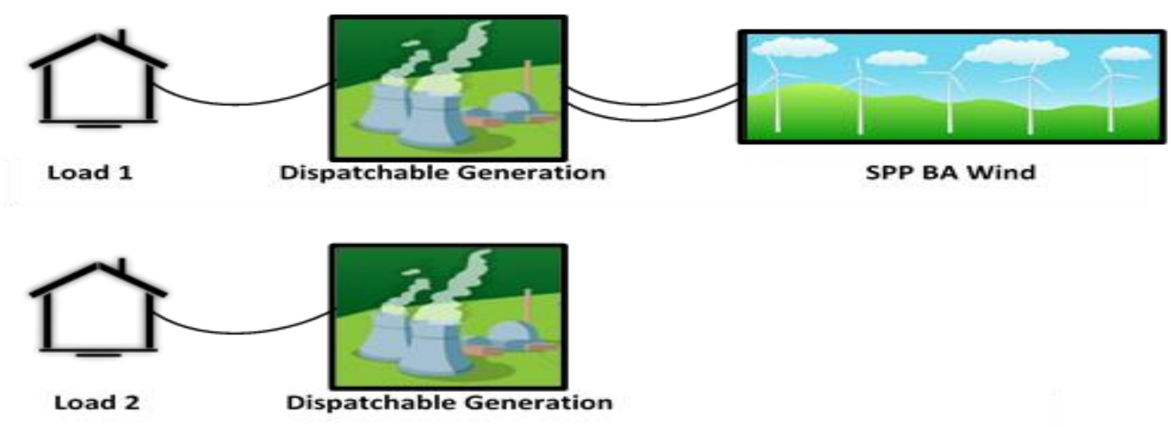

Figure 1: With and without the wind and solarresources

With each base system case being at the same reliability level, as shown in Figure 2, the only difference between the two cases is that the load was adjusted to meet a required LOLE metric of one day in 10 years.

[3] ELCC has been used for determining capacity value of resources since the 1960's when Garver demonstrated the use of Loss of Load Probability (LOLP) in the calculation of ELCC (Section 2 of the 2019 ELCC Wind Study Report)

This difference in adjusted load is the amount of ELCC expressed in load or megawatts, which is done by subtracting Load 2 (58, 757MW) from Load 1(61,874MW), and in this case equals 3,117MW. This number (3,117MW) is divided by SPP wind capacity of 19,339MW and expressed in percentage form. The wind resources in the ELCC example Fig. 2 have an ELCC of 16.1 percent of the resource's nameplate capacity.

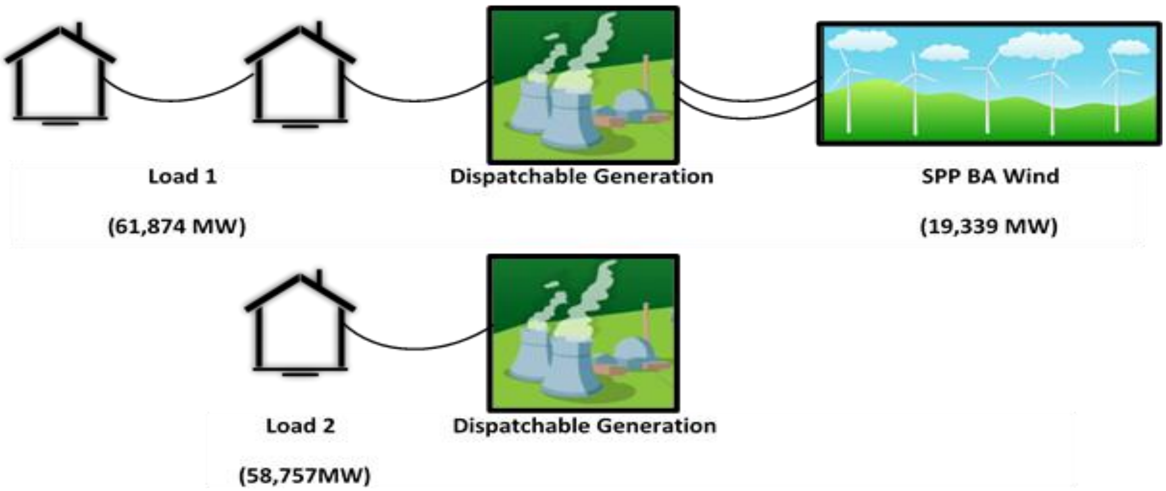

Figure 2: Differnce in load amounts

4. Results from the ELCC Wind Study

SPP Staff completed the ELCC Wind Study in early 2019 using SERVM software. The results of the ELCC Wind Study demonstrated that while the total capacity available from wind resources increases with penetration, the accredited percentage of capacity related to nameplate of each individual resource will decrease. This is illustrated in the Figure 3 below, which is taken from the ELCC Wind Study. The yellow line indicates the total capacity available from wind increases to 5,633 MW for an installed capacity of approximately 38,678 MWs. However, the ELCC of these resources decreases from 19.9% with 19,339 MW of wind to 14.6% with an installed capacity of 38,678 MW[4].For reference, the current SPP accreditation methodology in Planning Criteria 7.1.6.1 is shown on the green line. The capacity value difference between the ELCC methodology and the current Planning Criteria is a potentially over-valuing

[4] Reference Appendix C

approximately 5,000MW of accredited capacity for an installed wind fleet of 38,678 MW nameplate capacity

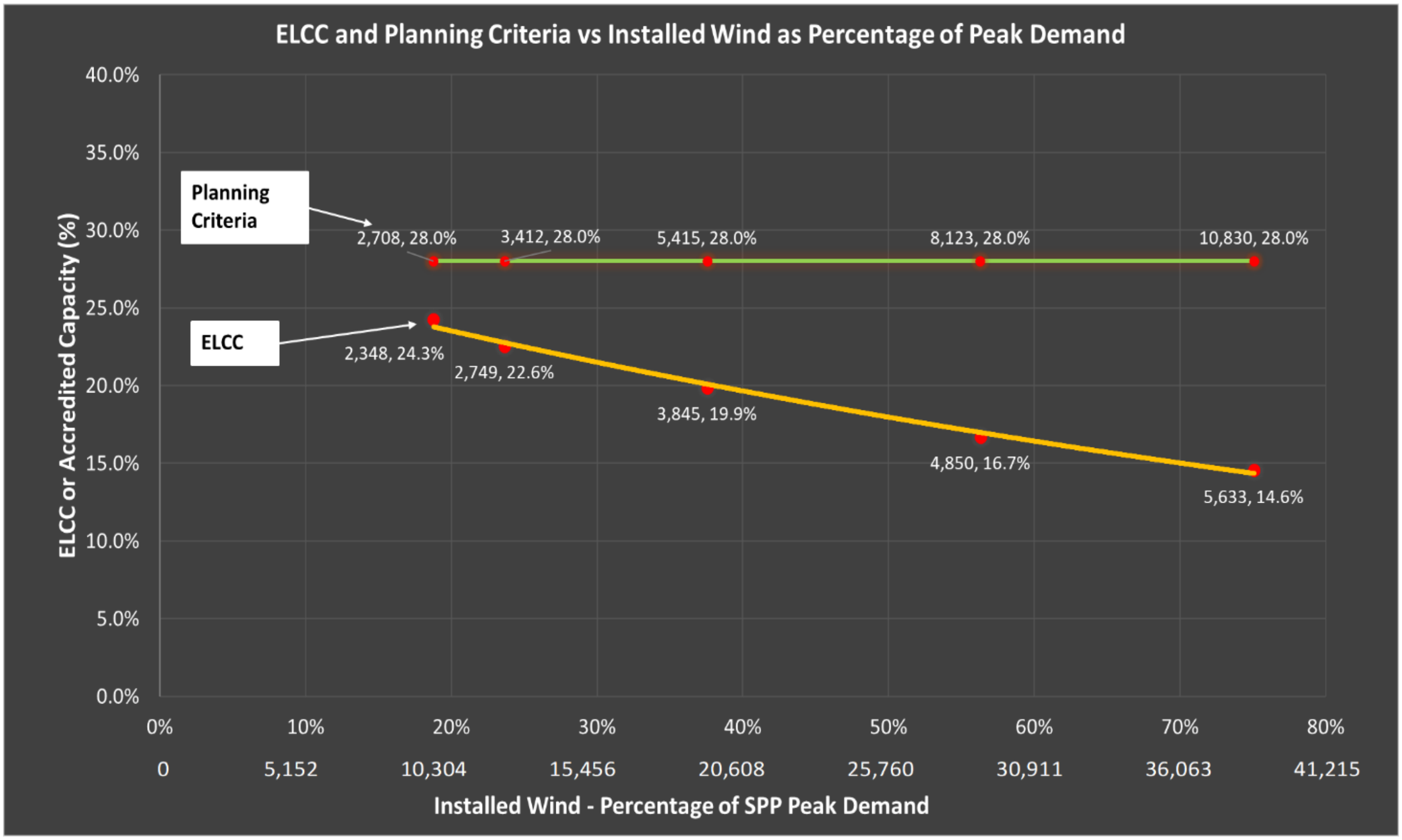

Figure 3: Methodology comparison between SPP Criteria and ELCC

5. Results from the ELCC Solar Study

SPP Staff completed the ELCC Solar Study in 2019 using SERVM software. The results of the ELCC Solar Study demonstrated that while the total capacity available from solar resources increases with penetration, the accredited percentage of capacity related to nameplate of each individual resource will decrease. This is illustrated in the Figure 4 below, which is taken from the ELCC Solar Study.

The yellow line indicates the total capacity available from solar increases to 6,200 MW for installed capacity of 40,000 MW. However, the ELCC accreditation percentage of the resources decreases from 62.4% with 4,282 MW of solar to 15.5% for 40,000 MW. For reference, the current SPP accreditation methodology in Planning Criteria 7.1.6.1 is shown on the green line with an accredited percentage of 60.7% for penetration levels above 1,000 MW, which stays consistent for any future level of penetration. Historical output from the installed existing solar facilities (215 MW) was used to determine the accredited capacity for both methods, ELCC and Planning Criteria. The additional amounts of solar penetration (1,000 MW and greater) utilized solar shapes from existing sites and additional potential sites based on the assumptions in Section **Error! Reference source not found.** of this report. The difference in assumptions (more diversity of solar sites including sites in the northern latitudes of SPP) causes the initial decrease in accredited percentage from 215 MW to 1,000 MW shown in Figure 4.

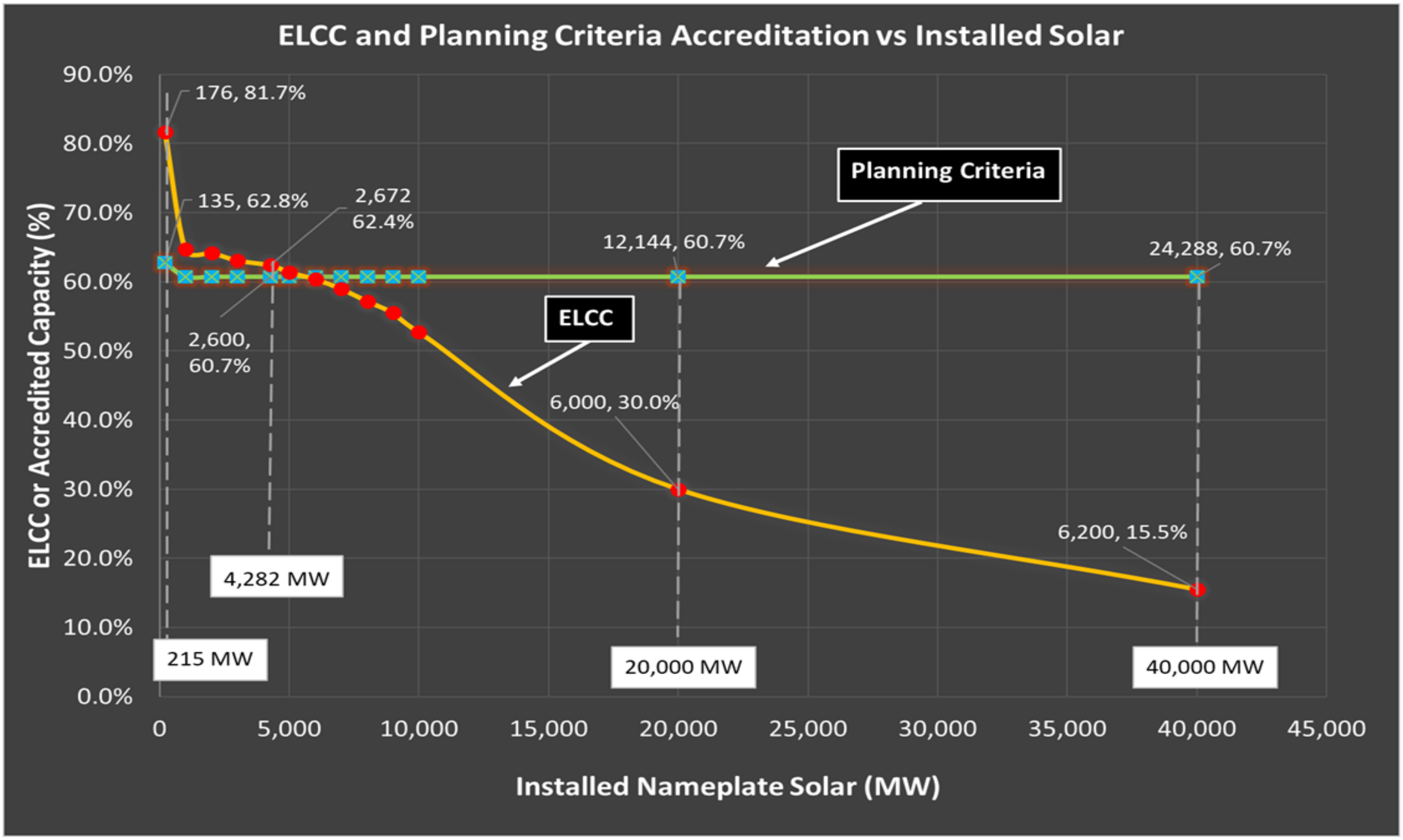

Figure 4: Methodology comparison between SPP Criteria and ELCC

In summary, the SPP ELCC solar analysis:

- Determined the ELCC accredited capacity of installed solar.
- Determined, based on actual and supplemental solar data used in the study that as solar penetration increases there is a reliability concern that the current SPP Planning Criteria will over-value the accredited capacity of solar.

- Concluded that if wind and solar are analyzed together for the calculation and allocation of ELCC, there is a high probability that solar resources could receive a portion of the combined ELCC accreditation that otherwise may have been allocated for wind. This is based on the current methodology allocating ELCC on the top 3% of load hours.

Based on this determination, SPP staff recommends that wind and solar be independently studied for the purposes of ELCC accreditation.

6. ELCC Allocation Guidelines

The main driver for the proposed three-tiered study and allocation process, for both wind and solar, is that it allows SPP members to have more certainty from a resource planning process. The methodology, from a Tier 1 firm perspective, creates a floor on how much capacity value that each LRE can reliably plan on from their variable resources. It bridges the gap between a regional and zonal study and allocation process. If a member goes all in on wind and/or solar it will not have as great an impact on other members that may be implementing variable resources at a slower rate. Since the floor is based on Tier 1 only, it also encourages firm transmission service, which safeguards the delivery of these resources.

Using solar as an example, the proposed 20% threshold was determined based on the latest ELCC solar study results. The results in Figure 4, show solar ELCC accreditation being approximately 50% at a penetration level of 10,000 MW, which currently equates to approximately 20% of SPP peak load. The 20% threshold sets an estimated floor for Tier 1 resources, which would be consistent for all LREs, regardless of how many solar resources come into commercial operation in the SPP footprint.

a. Study Priority for Wind

SPP staff will perform an annual ELCC[5] wind study on both the summer and winter seasons to determine the MW amount of accreditation that wind resources receive. As evidenced in Figure 3, when wind penetration is lower on the system, the ELCC accreditation tends to be of higher value on a percent of nameplate (MW). Because SPP policy currently requires that a generator be designated as a network resource or have point to point transmission attached it is important that the accreditation that is claimed by those LREs with the MWs of wind that meet these criteria not be reduced by resources that do not. It is also

[5] The ELCC study will piggyback off the latest LOLE study that was performed. The 2019 ELCC Wind and Solar Studies were based off the 2017 LOLE study assumptions.

important to protect the long-term investments of LREs by providing an estimated floor to the value of capacity for the resources. For this reason, wind resources will be broken into three tiers based on the resource's ability to serve load.

Tier 1 shall consist of the sum of each LRE's Tier 1 wind capacity. The LRE's Tier 1 wind capacity is determined by the taking the lesser of 1) the sum of the LRE's firm transmission service amount for each of its wind resources used to meet its resource adequacy requirement or 2)35% of the LRE's average seasonal peak load for the previous three years. The 35% of nameplate point equates to an approximate ELCC accreditation of approximately 21%. This sets an estimated floor to the Tier 1 resources regardless of the wind penetration in the SPP footprint. Tier 1 will have priority in the study queue and will have the ELCC capacity value determined first. For example, using wind data from Figure 3 above, Tier 1 consists of 12,185MW of wind resources; the Tier 1 resources will be assigned an ELCC value of 2,749MW. Tier 2 shall consist of the sum of the wind resources with firm transmission service used to meet LREs' resource adequacy requirements that were not utilized in Tier 1. If Tier 1 and 2 resources do not have firm transmission service on the full contract or ownership amount, the remaining nameplate rating capability of the resource will be studied in Tier 3, as shown in Figure 5. Tier 3 will consist of all additional wind and the leftover MWs from Tier 2 and 3. Again, using wind data from Figure 3, if Tier 3 consisted of an additional 3,154 the resulting value to Tier 3 is 400MW as shown in the Equation Example 1 below.

$$Nameplate\ Capacity = 19{,}339\ MW \text{ and } ELCC\ Accreditation\ = 3{,}845\ MW$$

$$Accreditation\ Percentage\ of\ all\ wind\ \frac{3845}{19339} = 19.9\ \%$$

$$Tier\ 1\ Capacity = 12{,}185 MW\ and\ ELCC\ Accreditation = 2{,}749\ MW$$

$$Accreditation\ Percentage\ of\ Tier\ 1\ wind\ \frac{2749}{12185} = 22.6\ \%$$

$$Leftover\ Capacity\ from\ Tier\ 1\ = 7{,}145\ MW$$

$$Tier\ 2\ Capacity = 4000\ MW\ \ Tier\ 2\ ELCC\ Accreditation = 696\ MW$$

$$Accreditation\ Percentage\ of\ Tier\ 2\ wind\ \frac{696}{4000} = 17.4\ \%$$

$$Tier\ 3\ Capacity = 3{,}154\ MW\ \ Tier\ 3\ ELCC\ Accreditation = 400\ MW$$

$$Accreditation\ Percentage\ of\ Tier\ 3\ wind\ \frac{400}{3154} = 12.6\ \%$$

Equation Example 1: Tier 1, Tier 2 and Tier 3 Calculation

b. Study Priority for Solar

SPP staff will perform an annual ELCC[6] solar study on both the summer and winter seasons to determine the MW amount of accreditation that solar resources receive. As evidenced in Figure 4, when solar penetration is lower on the system, the ELCC accreditation tends to be of higher value on a percent of nameplate (MW). Because SPP policy currently requires that a generator be designated as, a network resource or have point to point transmission attached it is important that the accreditation that is claimed by those LREs with the MWs of solar that meet these criteria not be reduced by resources that do not. It is also important to protect the long-term investments of LREs by providing an estimated floor to the value of capacity for the resources. For this reason, solar resources will be broken into three tiers based on the resource's ability to serve load.

Tier 1 shall consist of the sum of each LRE's Tier 1 Solar Capacity. The LRE's Tier 1 Solar Capacity is determined by the taking the lesser of 1) the sum of the LRE's firm transmission service amount for each of its solar resources used to meet its resource adequacy requirement or 2) 20% of the LRE's average seasonal peak load for the previous three years. The point where the solar ELCC was at roughly 50% on Figure 4 determined the 20% threshold. That point is where solar nameplate is at 10,000 MW, which equates to roughly 20% of SPP peak load. This sets an estimated floor to the Tier 1 resources regardless of how many solar resources are online in the SPP footprint. Tier 1 will have priority in the study queue and will have the ELCC capacity value determined first. For example, using solar data from Figure 4 above, if the Tier 1 consists of 5,000MW of solar resources; the Tier 1 resources will be assigned an ELCC value of 3,050MW. Tier 2 shall consist of the sum of the solar resources with firm transmission service used to meet LREs' resource adequacy requirements that were not utilized in Tier 1. If Tier 1 and 2 resources do not have firm transmission service on the full contract or ownership amount, the remaining nameplate rating capability of the resource will be studied in Tier 3, as shown in Figure 5. Tier 3 will consist of all additional solar and the leftover MWs from Tier 1 and 2. Again, using solar data from Figure 4, if Tier 3 consisted of an additional 2,000MW, the ELCC value assigned to Tier 3 would be the difference of the calculated ELCC

[6] The ELCC study will piggyback off the latest LOLE study that was performed. The 2019 ELCC Wind and Solar Studies were based off the 2017 LOLE study assumptions.

value of 4,060MW (value at 7,000MW of nameplate capability) less the value assigned to Tier 1 and 2 (3,600MW). The resulting value to Tier 3 is 460MW as shown in the Equation Example 2 below.

$$Nameplate\ Capacity = 7{,}000\ MW \text{ and } ELCC\ Accreditation\ = 4{,}060\ MW$$

$$Accreditation\ Percentage\ of\ all\ wind\ \frac{4060}{7000} = \ 58\ \%$$

$$Tier\ 1\ Capacity = 5{,}000\ MW\ and\ ELCC\ Accreditation = 3{,}050\ MW$$

$$Accreditation\ Percentage\ of\ Tier\ 1\ wind\ \frac{3050}{5000} = \ 61\ \%$$

$$Tier\ 2\ Capacity = (6{,}000 - 5{,}000) = 1{,}000\ MW$$

$$Tier\ 2\ ELCC\ Accreditation = \ (3{,}600 - 3{,}050) = 550\ MW$$

$$Accreditation\ Percentage\ of\ Tier\ 2\ wind\ \frac{550}{1000} = \ 55.0\ \%$$

$$Tier\ 3\ Capacity = (7{,}000 - 6{,}000) = 1{,}000\ MW$$

$$Tier\ 3\ ELCC\ Accreditation = \ (4{,}060 - 3{,}600) = 460\ MW$$

$$Accreditation\ Percentage\ of\ Tier\ 3\ wind\ \frac{460}{1{,}000} = \ 46.0\ \%$$

Equation Example 2: Tier 1, 2 and 3 Calculation

An example of the tiered allocation by Load Responsible Entity using the information from Equation Example 2 is provided in Tables 1 through 3 below. In this example, LRE3 has enough solar resources with firm transmission service to qualify for Tier 2 capacity allocation.

	Tier 1	Tier 2	Tier 3
Nameplate	5000	6000	7000
ELCC	3050	3600	4060

Table 1. ELCC for Solar Example Allocation

	Load	Solar Installed	Solar Installed w/ Firm Service	Solar Available in Tier 1	Tier 1 Allocation	% Nameplate for Tier 1
LRE 1	5000	1000	1000	1000	610.0	61%
LRE 2	15000	700	500	500	305.0	61%
LRE 3	10000	3200	3000	2000	1220.0	61%
LRE 4	8000	0	0	0	0.0	0%
LRE 5	12000	2100	1500	1500	915.0	61%
Total	50000	7000	6000	5000	3050	

Table 2. Example Tier 1 Solar Allocation

	Tier 2 Pool	Tier 2 Allocation	Tier 2 %	Tier 3 Pool	Tier 3 Allocation	Tier 3 %	Total Accreditation	Total % of Nameplate
LRE 1	0	0.0	0%	0	0.0	0%	610.0	61%
LRE 2	0	0.0	0%	200	92.0	46%	397.0	57%
LRE 3	1000	550.0	55%	200	92.0	46%	1862.0	58%
LRE 4	0	0.0	0%	0	0.0	0%	0.0	0%
LRE 5	0	0.0	0%	600	276.0	46%	1191.0	57%
	1000	550.0		1000.0	460.0		4060.0	

Table 3. Example Tier 2 & 3 Solar Allocation

c. <u>ELCC Allocation Load Shape</u>

Once each tier level has had its total ELCC assigned, the ELCC megawatt value will be allocated to each individual wind or solar resource. The allocation to Tier 1 and 2 wind and solar resources will be based on the LRE load shapes, which will accredit these resources based on historical performance for serving the load for which they are contracted. For accurate allocation of Tier 1 and 2 wind solar resources, LREs will be required to annually submit their previous years hourly load data to SPP. If the LRE does not provide the data by June 1, their resource will be allocated with Tier 3 wind and solar resources.

The assignment to Tier 3 wind and solar resources will be based on the SPP BA load shape, which will give these resources an accreditation percentage based on historical performance at the time of the SPP peak.

d. ELCC Allocation Load Hours

The available accredited capacity from the ELCC study will be allocated by selecting the hourly net power output values occurring during the top 3% of load hours for the LRE (Tier 1 and 2 resources) or SPP BA load (Tier 3 resources) for the peak season that is being analyzed. The yearly values selected will be averaged together to determine the amount of historical production during the top 3% load hours. The data must include the most recent 3 years. For solar and wind, SPP staff will add curtailments back into the hourly historical performance data. The curtailments will be gathered internally from Market data.

- For wind or solar facilities in commercial operation 3 years or less:
    a) A new wind or solar facility that does not have 3 years of operational data may provide on-site weather data (such as wind speed and solar irradiance data), and facility attributes (such as turbine power curves, inverter load ratios, etc.) to create a power production estimate by the facility owner or operator. SPP Staff will use those data if provided.
    b) If a new wind or solar facility does not provide historical estimated output, LREs/GOs will generate output data from the nearest wind and/or solar facility with a comparable capacity factor or technology vintage to complete the appropriate data set. If no nearby facility has a comparable capacity factor, the output data from the existing facility will be scaled up to mimic the power curve for the technology of the facility.
    c) Estimated output values may be calculated from wind or solar data, if measured MW values are not yet available. Wind data correlated with a reference tower beyond fifty miles and solar data correlated with a reference-measuring device beyond two hundred miles, is subject to Supply Adequacy Working Group approval.
    d) If a new wind or solar facility does not provide historical estimated output that facility will be included in the annual ELCC study, but will not receive any accreditation

e) As operational data become available, those data will supplant estimated or modeled output data.

- For wind or solar facilities that have been in commercial operation greater than 3 years:
  a) The data used by SPP staff will include no more than the most recent 10 years of commercial operation.
  b) Only metered hourly net power output (MWH) data at the point of interconnection may be used.
  c) If a wind or solar facility that has been in commercial operation greater than 3 years undergoes a technology change, it will continue to use the previous 10 years MW output, unless the LRE/GO chooses to treat the existing facility as new facility. If treated as a new facility it would be considered as a wind or solar facility that has been in commercial operation 3 years or less.

7. ELCC Schedule for Implementation

In order to allow LREs a level of certainty based on existing wind and solar accreditation expectations in the next 3 year planning horizon, the ELCC methodology schedule for implementation is proposed starting with the 2023 summer season. Until ELCC becomes effective, wind and solar resources will continue to calculate accreditation based on current SPP Planning Criteria in 7.1.6.1 (7). Starting with the 2023 summer season, all wind and solar resources will be accredited using the ELCC methodology.

SPP staff will perform a summer and winter ELCC study in years 2020 and 2021, and allocate the results to each Load Responsible Entity (LRE) as proposed in this white paper for information only. Results for the 2023 Summer Resource Adequacy process will be posted by October 1, 2022. The study will include all resources that have either reached commercial operation by June 1, 2022 or have been submitted in the February 15, 2022 Resource Adequacy Workbook (RAW) as intended to be available for the 2023 summer peak. An LRE always retains the right to determine whether to report accredited capacity for resource adequacy purposes in the annual Resource Adequacy Workbook.

8. New Facilities

It is recognized that wind and solar facilities may come into service after June 1 of any individual calendar year or may not be submitted by the appropriate LRE in time to be included in the annual ELCC study. Such occurrences should be rare given the construction lead times for generating facilities. For new wind or solar facilities that reach commercial operation after June 1 of the applicable study year, the facilities must be submitted in the Workbook by Feb 15 to be studied in the upcoming ELCC study. If not, the facility would receive a 10% accreditation for wind and a 50% accreditation for solar for the upcoming summer peak season[7] or the average of the lowest tier whichever is lower.

If a new facility, has a commercial operation date of November 1, 2022 and is reported in the Workbook submission by May 15, 2022 that facility will be studied in the 2022 ELCC study. The new facility will be allocated accreditation for the 2023 summer season. In this example, the entity must demonstrate the facility is a Designated Resource before June 1, 2022 [8]in order to be considered a Tier 1 resource if a new facility was not analyzed in the 2022 ELCC study then that facility would receive a 10% or 50% accreditation for the 2023 summer season.

9. Annual ELCC Accreditation Review

Leading up to and upon implementation, the SAWG shall continue to monitor the ELCC accreditation for wind and solar. Modifications to the methodology may be deemed appropriate and could include changes to the tier definitions and allocation methodology for each facility.

[7] Once a winter accreditation is determined from ELCC and winter accreditation % will be included in the Criteria language
[8] ELCC study will annually commence on June 1st.

Appendix

Appendix A:

2019 ELCC Wind Study

Appendix B:

2019 ELCC Solar Study

Appendix C:

For the ELCC Wind Study, the scaling approach that SPP staff chose was to scale up or down the current wind installations installed in the SPP footprint. This method was used instead of trying to predict where future wind installations would be located, which could inaccurately bias the results for any future installed capacity. For example, if the selection of future wind was predominantly located in higher wind capacity areas, it could alter the results compared to the wind resource locations actually in commercial operation.

This could appear as a conservative modeling assumption that future wind plants would have output patterns identical to those of existing wind plants. In reality, future wind plants could inherently have output patterns that are different from those of existing wind plants, which may increase or decrease the ELCC of those resources above the level modeled by SPP. This is because new wind plants built even a short distance away from existing wind plants will have somewhat different output patterns due to the inherent geographic diversity of wind resources. In addition, technological advances such as taller turbine towers and longer blades are increasing the output of new and repowered wind plants. Historically, this tends to significantly increase the capacity value of these plants because the increase in output primarily occurs during periods when older wind plants had lower output. These factors could potentially help offset the decline in wind's ELCC percentage at higher wind penetrations. The impacts of new wind farms will be captured in the annual ELCC wind analysis and the results will reflect the impacts of the new technology based on the historical performance, which could increase or decrease ELCC accreditation.

Appendix D:

Solar and Wind Studied Together

The effects of wind and solar studied together versus separately were analyzed as well using the results from the ELCC Wind Study Report[9]. The results in Table 1 represent the ELCC values for 19,339 MW of nameplate wind and 4,282 MW of nameplate solar studied together versus studied separately shows a difference of 130 MW of accreditation between the two averages accounting for less than 0.5% of nameplate capacity. If wind and solar are analyzed separately, the effects of each resource type can be analyzed and an associated ELCC can be established for each fuel type, which does not over-value one resource over the other based on the allocation of capacity.

Table 1: ELCC results of wind and solar studied together vs separately.

4,282 MW Solar and 19,339 MW Wind Studied Together Vs. Separately						
Year	Wind & Solar Studied Together (MW)	Wind & Solar %	Solar Only (MW)	Wind Only (MW)	Wind Only + Solar Only (MW)	Total %
2012	4,464	18.9%	2,313	2,043	4,356	18.4%
2013	4,495	19.0%	2,365	2,022	4,387	18.6%
2014	6,100	25.8%	2,731	3,126	5,857	24.8%
2015	7,099	30.1%	2,937	3,952	6,888	29.2%
2016	9,114	38.6%	2,733	6,198	8,931	37.8%
2017	8,823	37.4%	2,960	5,932	8,892	37.6%
Average	**6,682**	**28.3%**	**2,673**	**3,879**	**6,552**	**27.7%**

[9] 2019 ELCC Wind Study Report: https://www.spp.org/Documents/60434/2019%20ELCC%20Wind%20Study%20Report.pdf