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December 14, 2015

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UM 1719 – In the Matter of PUBLIC UTILITY COMMISSION of OREGON, Investigation to Explore Issues Related to a Renewable Generator's Contribution to Capacity

Attention Filing Center:

Attached for filing in the above-referenced docket is Idaho Power Company's Opening Testimony of Rick Haener.

Please contact this office with any questions.

Very truly yours,

Sharon Cooper

Sharon Cooper
Legal Assistant

Attachment

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

UM 1719

In the Matter of	)
	)
PUBLIC UTILITY COMMISSION OF OREGON,	)
	)
Investigation to Explore Issues Related to a Renewable Generator's Contribution to Capacity.	)

IDAHO POWER COMPANY

OPENING TESTIMONY

OF

RICK HAENER

December 14, 2015

Q. Please state your name and business address.

A. My name is Rick Haener and my business address is 1221 West Idaho Street, Boise, Idaho 83702.

Q. By whom are you employed and in what capacity?

A. I am employed by Idaho Power Company ("Idaho Power" or "Company") as the Power Supply Planning Leader.

Q. Please describe your educational background.

A. I received a Bachelor of Science degree in Accounting from the University of Idaho in Moscow, Idaho.

Q. Please describe your work experience with Idaho Power.

A. In 2004, I accepted a position at Idaho Power as a Business Support Analyst in Delivery Finance. In 2005, I accepted a position as a Senior Planning Analyst in Power Supply. In 2010, I accepted a position as the Fuels Management Coordinator in Power Supply Joint Projects. In 2015, I was promoted to the position of Power Supply Planning Leader. Of particular significance for this docket, as the Power Supply Planning Leader, I am responsible for overseeing the Company's Integrated Resource Plan ("IRP") planning process.

Q. What is the purpose of your testimony?

A. On March 10, 2015, the Public Utility Commission of Oregon ("Commission") issued Order No. 15-077 opening an investigation to explore issues related to a renewable generator's contribution to capacity. On September 9, 2015, Administrative Law Judge Sarah Rowe issued a Prehearing Conference Memorandum setting the procedural schedule for this docket, and reminding the parties that the August 25, 2015, memo in this docket asked all parties address, at a minimum, the following matters:

1. The preferred methodology to calculate a renewable generator's contribution to capacity; and
2. The pros and cons of:
   a. Using an Effective Load Carrying Capability ("ELCC") calculation;
   b. Requiring an alternative or approximation method to be benchmarked against an ELCC calculation; and
   c. Requiring the utilities to use the same calculation method.

The purpose of my testimony is to address these issues.

Q. Does Idaho Power have any experience calculating a renewable generator's contribution to capacity?

A. Yes. Idaho Power calculates renewable generator's contribution to capacity as part of its IRP process and as required for the avoided cost pricing of projects developed under the Public Utility Regulatory Policies Act of 1978 ("PURPA"). Idaho Power currently has more than 780 megawatts ("MW") of PURPA Qualifying Facilities ("QF") operating on its system, of which more than 570 MW is wind generation. The Company also has more than 380 MW of QF solar generation and an additional 50 MW of QF wind generation under contract to be on-line by the end of 2016.

Q. Is Idaho Power familiar with what is referred to as the ELCC methodology/calculation?

A. Yes. The basics of the ELCC calculation are described in numerous papers, including a 2012 report produced by the National Renewable Energy Laboratory entitled "Comparison of Capacity Value Methods for Photovoltaics in the Western United States."[1]

[1] Madaeni, S. H.; Sioshansi, R.; and Denholm, P. "Comparison of Capacity Value Methods for Photovoltaics in the Western United States." NREL/TP-6A20-54704, Denver, CO: National Renewable Energy Laboratory, July 2012 (NREL Report), http://www.nrel.gov/docs/fy12osti/54704.pdf.

Q. Please describe the basics of the ELCC methodology.

A. Yes. The ELCC is an iterative method where the utility likelihood of failing to meet load is defined for each hour or period, then a new generator is added to the utility system and the utility load is increased through sequential iterations until the utility likelihood of failing to meet load is equivalent to the starting condition. The ELCC value of the new generation is the difference in utility load served as measured by the difference between the utility load at starting condition and the utility load at ending condition where the likelihood of failing to meet load is equivalent.

Q. Has Idaho Power developed a preferred methodology to calculate a renewable generator's contribution to capacity?

A. Yes. Idaho Power approximates the ELCC when calculating a renewable generator's contribution to capacity. Idaho Power uses slightly different ELCC approximation methods to estimate the contribution to peak capacity when planning for new renewable generation and when calculating avoided cost pricing for proposed PURPA projects. For both the IRP process and for avoided cost pricing, Idaho Power has been required to estimate the contribution to peak capacity long before significant quantities of wind or solar generation were added to the Idaho Power system. Using actual wind data provided by the developers of several wind projects developed under the provisions of PURPA and, more recently, using forecasted solar generation output provided by PURPA solar developers, Idaho Power has developed methods to calculate the contribution to capacity as a percentage of generation nameplate capacity. Idaho Power includes the calculated contribution to capacity in its planning process.

Q. What characteristics does Idaho Power consider important in determining a method to calculate a renewable generator's contribution to capacity?

A. The important characteristics to be considered in determining a method to calculate the contribution to capacity for a renewable generator are:

1. Reasonable accuracy;
2. Transparent calculations; and
3. Calculations that can be easily verified by an independent party.

Additionally, the use of a proposed PURPA QF project's generation profile and data is an important component for avoided cost pricing.

Q. What is the methodology used by Idaho Power to calculate a wind generator's contribution to capacity?

A. For the 2004 IRP, Idaho Power estimated the contribution to capacity for wind generation using data provided by wind project developers. In 2003 and 2004, Idaho Power had only one signed PURPA wind contract and there were no utility-scale wind generation projects connected to Idaho Power's system. Idaho Power worked with representatives from the wind industry, and members of the IRP Advisory Council, who agreed that a five percent peak capacity contribution for wind generation was a reasonable approximation to be used as part of the 2004 IRP (Idaho Power 2004 IRP, pages 55 and 56.) A similar description of the wind peak capacity contribution is on page 49 of the Idaho Power 2006 IRP.

> Wind output during peak hours in July was based on actual data provided by a wind developer for a specific project [in Idaho]. The data indicate that, during July between the hours of 4:00 PM and 8:00 PM, a 100 MW wind project will produce 5 MW or more 70 percent of the time. However, the wind data also indicate that the project will produce 5 MW or less 30 percent of the time. Based on the wind data, Idaho Power assumes that a 100 MW wind project would provide 5 MW of capacity during summer peak hours.

Idaho Power has used the five percent value for the contribution to peak capacity for wind generation since the 2004 IRP.

Q. Now that Idaho Power has more than 570 MW of PURPA wind and 101 MW of non-PURPA wind operating on its system, has the Company confirmed the use of the five percent contribution to peak capacity for wind?

A. Yes. Based upon analysis of the actual generation data from the wind projects currently operating on Idaho Power's system, the wind generator's contribution to peak capacity used for avoided cost pricing is 3.9 percent, which supports the continued use of the Company's five percent estimate for planning purposes in the IRP.

Q. How does the Company's use of a five percent peak capacity contribution for a wind resource compare to an estimation using the ELCC methodology?

A. During the August 17, 2015, workshop held at the Commission in Salem, Oregon, Michael Milligan presented ELCC information. On page 26 of Michael Milligan's presentation, there is a graphic comparing the various wind ELCC metrics. Idaho Power's service territory falls in the Basin region. The wind capacity credit value for the Basin region is shown to be ten percent or less, which supports the five percent value used by Idaho Power in resource planning.

Q. What is the methodology used by Idaho Power to calculate a solar generator's contribution to capacity?

A. Idaho Power faced a similar situation as it did with wind generation in determining an estimate for the capacity contribution of solar generation while preparing the 2015 IRP. Idaho Power presently has 24 signed PURPA contracts for 389 MW of solar photovoltaic ("PV") generation, which will be connected to its system by the end of 2016. However, currently, there are no utility-scale solar PV projects connected to Idaho Power's system; consequently, no actual PV generation data is available, just as there was no wind generation data available when Idaho Power considered the wind contribution to capacity as part of the 2004 IRP. Therefore, for the 2015 IRP, Idaho Power developed a method to estimate the solar PV contribution to peak capacity using simulated solar generation for water years 2011 through 2013. The simulated solar generation data was developed for the Idaho Power solar integration study, and the method to estimate the PV generation contribution to capacity is described on pages 50 and 51 of Idaho Power's 2015 IRP. The time period studied in the analysis is October 1, 2010, through September 30, 2013. Idaho Power used the simulated solar generation from the solar integration study combined with time-coincident actual load data from the same time period to estimate the solar peak-hour capacity factors.

The solar data was compiled for nine sites that were spread across southern Idaho and covered over 220 miles from east to west. The sites represent elevations ranging from 2,300 feet to 4,900 feet. The nine research sites were selected based on the geographic distribution of the PURPA PV projects located on the Idaho portion of the Idaho Power service territory that have signed contracts. The use of high resolution interval data is critical to characterizing the variability of solar, and Idaho Power utilized five-minute interval global horizontal irradiance data from each of the research sites. The research data evaluated in the study included the established United States Bureau of Reclamation ("USBR") AgriMet Network ("AgriMet") supplemented with modeled data from SolarAnywhere®.[2] AgriMet is a network of automated agricultural weather stations operated and maintained by the USBR. Idaho Power worked directly with the USBR Pacific Northwest Region AgriMet manager to obtain data for the sites. AgriMet data was augmented with data from the University of Oregon Solar Radiation Monitoring Laboratory when AgriMet data was incomplete. Additionally, Idaho Power utilized high resolution modeled

[2] SolarAnywhere® offers world-class irradiance and weather data, and solar energy simulation services, https://www.solaranywhere.com.

solar data acquired by contract from SolarAnywhere® in order to acquire five-minute data for the Grand View, Murphy, Orchard, and Bliss sites.

Q. Please describe the methodology used to determine a value for the contribution to peak of a solar PV generation resource.

A. In essence, Idaho Power's estimation used the system load data to identify the highest 150 load hours, used the simulated solar generation data to estimate the time-coincident simulated solar generation during the identified 150 hours, and calculated a weighted average of the solar contribution to capacity where the frequency of the hour was used as the weight in the weighted average calculation. The steps of the process are as follows:

1. Identify the 150 highest load hours from 2011 through 2013 (all are summer hours).
2. Determine the simulated solar generation during each of the 150 highest load hours. Solar generation simulation is from the Idaho Power solar integration study and is simulated at five-minute intervals at a set of utility-scale solar generation sites across Idaho Power's service area. The five-minute data was compiled into an average for the hour.
3. Group the solar generation by clock hour for the 150 highest load hours (e.g., a list of all the solar generation values for the clock hour from 2:00 p.m. to 3:00 p.m. during the 150 highest load hours).
4. Estimate the 90th percentile exceedance for each clock hour represented in the 150 highest load hours (among the highest 150 load hours, during the clock hour starting at xx:00, nine times out of ten, the solar generation was simulated to be at least xx percent of the maximum possible delivered solar generation).
5. Calculate a weighted average of the solar generation for the series of clock hours; the clock hours are weighted by the proportion the clock hour is represented in the top 150 load hours.

Idaho Power used the same process with different solar generation data for estimating fixed-panel generation systems and solar tracking generation.

Q. What were the results of this methodology for determining the contribution to peak of a solar PV generation resource?

A. Based on the analysis, Idaho Power used values from 28 percent to 51 percent to calculate the contribution to peak capacity for PV solar in the 2015 IRP. For purposes of avoided cost pricing, the PV solar generation capacity values are then adjusted to reflect the characteristics of the specific PURPA solar PV projects, such as panel orientation, tracking, and panel technology. The variation in PV peak capacity credit is due to the specific characteristics of the PURPA project, such as panel orientation, location, and tracking technology. Presently, Idaho Power assigns a solar PV capacity credit to PURPA solar projects of approximately 55 percent.

Q. How does the Company's estimation of the peak capacity contribution for a solar PV resource compare to an estimation using the ELCC methodology?

A. On page 27 of Michael Milligan's presentation to the Commission on August 17, 2015, there is a graphic comparing the various PV ELCC metrics. As I stated before, Idaho is in the Basin region where the PV capacity credit value is approximately 45 percent, which supports the values used by Idaho Power in resource planning (28 percent to 51 percent, depending on PV technology in the 2015 IRP, and approximately 55 percent for resource capacity planning purposes in the PURPA contract calculations). It should be noted that the North American Electric Reliability Corporation ("NERC") Transmission Expansion Planning Policy Committee assigns a uniform capacity contribution value of 60 percent for solar PV throughout the Western Electricity Coordinating Council ("WECC"). The methods used by Idaho Power in the 2015 IRP to calculate the contribution to peak capacity for solar PV and wind generation appear to be reasonably accurate and consistent with recent assessments conducted by outside parties in the region.

Q. Does this estimation of the contribution to peak for solar PV generation resources achieve the goals the Company believes are important when determining an appropriate methodology?

A. Yes. The method used by Idaho Power appears to be reasonably accurate and consistent with recent assessments in the region, and the method is transparent and easily understood by outside parties. Transparent calculations are the second characteristic that Idaho Power considers important in calculating the contribution to peak capacity. As part of the 2015 IRP planning process, Idaho Power hosted separate breakout sessions to estimate the PV contribution to peak capacity. The breakout sessions were attended by IRP Advisory Council members and members of the public. In the breakout sessions, Idaho Power explained the research process, provided the participants with the intermediate calculations, final calculations, and presented the final results. Idaho Power also presented a summary of the breakout sessions in the regular IRP Advisory Council meetings. As described earlier, Idaho Power approximated the ELCC of PV using the highest 150 load hours during the 2011 through 2013 water years. The calculations were transparent and sufficiently understood by the IRP Advisory Council members and members of the public and the results were accepted by the IRP Advisory Council.

Q. Did the results and methodology undergo any scrutiny by the IRP Advisory Council?

A. Yes. Idaho Power released hourly load and generation data to the IRP Advisory Council members upon request and demonstration of need. Idaho Power released load and solar data and members of the IRP Advisory Council used the data to independently estimate and verify the contribution to peak capacity for PV generation on the Idaho Power system. The methods used by Idaho Power to calculate the contribution to peak capacity for PV generation appear to be verified by outside parties.

Q. How is the methodology different for determining the contribution to peak for avoided cost PURPA pricing?

A. The methodology I just described was used in the 2015 IRP for the Company's long-term planning purposes. For negotiated rates in PURPA avoided cost pricing, Idaho Power uses a similar approximation method that incorporates each proposed QF project's unique generation profile and data to assess the unique peak capacity contribution of each project. As part of the PURPA contracting process, a project delivers monthly and hourly output estimates in the form of a 12 x 24 matrix (12 months of the year by 24 hours of the day). The 12 x 24 matrix supplied by a proposed PURPA project is used to calculate the contribution to peak by comparison with a benchmark resource. The comparison between a proposed PURPA project and the benchmark resource is made at a 90 percent exceedance level. The table below shows the PURPA benchmarking matrix.

PURPA Benchmarking Matrix for Wind and Solar

	A	B	C	D
	Benchmark Type	**Benchmark**	**Peak Hour (July 3-7 p.m.) Capacity Factor (Average)**	**Peak Hour (July 3-7 p.m.) Capacity Factor (90% Exceedance)**
1	Wind	Idaho Power Wind (2008-2011)	27.4%	3.9%
2	Solar (AC - DC)	Idaho Power CHQ Roof Top PV (2009-2011)	51.9%	33.2%
3	Solar (AC - AC)	Idaho Power CHQ Roof Top PV (2009-2011)	63.3%	40.5%

Column A: Identifies the renewable technology.

Column B: Identifies the benchmark resource for each technology.

Column C: Represents the average capacity factor for all days in July during the defined peak hour period of 3:00-7:00 p.m. for the benchmark resource.

Column D: Identifies the 90 percent exceedance of reliability for capacity planning.

Q. Please describe the method used to determine the peak capacity of a hypothetical solar PV PURPA project.

A. A PURPA project's proposed peak capacity contribution is determined by using the peak hour period from the 12 x 24 matrix provided by the PURPA developer. The 12 x 24 matrix is compared to a representative benchmark resource for the same time period (the time period presently used for the comparison are the hours from 3:00 to 7:00 p.m., for all days during the month of July, during the years 2009, 2010, and 2011). The solar benchmark resource is the solar array on the roof of Idaho Power's corporate headquarters building. An example of how a benchmark resource performance is used in establishing the capacity contribution of a hypothetical new generic PURPA solar project is shown below.

Peak Hour Capacity Factor Benchmarking Example

	A	B	C	D
	Renewable Resource Type	**Peak Hour (July 3-7 p.m.) Capacity Factor (Average)**	**Ratio of PURPA Project Forecast to Actual Benchmark Resource**	**Peak Hour (July 3-7 p.m.) Capacity Factor (90% Exceedance)**
			C2=B2/B1	**D2=D1*C2**
1	Benchmark - Idaho Power CHQ PV Array (AC-AC)	63.3%	N/A	40.5%
2	New Generic PURPA Solar Project (AC-AC)	85.4%	1.35	54.6%

Each PURPA solar project is compared to the benchmark. For example, a possible generic PURPA solar project could have forecasts provided by the developer estimating that the generic PURPA resource will deliver on average 85.4 percent of nameplate capacity, during the four hours 3:00 pm to 7:00 p.m., every day in July. The benchmark resource actually delivered on average 63.3 percent of nameplate capacity during the peak period in July for the period 2009-2011. The generic PURPA solar project forecast is 135 percent of the benchmark observed output (85.4% / 63.3% = 135%). Further calculations indicate that the benchmark resource is shown to deliver 40.5 percent of nameplate capacity at least 90 percent of the time during the peak period in July from 3:00 to 7:00 p.m. Ninety percent reliability is defined by Idaho Power to be the standard for renewable capacity planning. The generic solar project used in the example is assumed to maintain the 135 percent scaling factor in the 90 percent exceedance test; therefore, the calculated capacity credit for the generic PURPA project is 54.6 percent of nameplate (1.35 x 40.5% = 54.6%).

Q. Does Idaho Power have an opinion regarding its preferred methodology to calculate a renewable generator's contribution to capacity as opposed to utilizing the ELCC methodology?

A. Yes. Idaho Power believes that its current methodologies satisfy the requirements of (1) providing reasonable accuracy, (2) providing transparent calculations, and (3) providing calculations that can be easily verified by an independent party. In addition, because Idaho Power has the benefit of utilizing actual data from the more than 570 MW of PURPA QF wind projects and 101 MW of non-PURPA wind, along with the extensive data developed for use in the Company's two solar integration studies, Idaho Power is able to verify that the Company's methods produce results accurately reflecting the real operation of projects. By the end of 2016, the Company will have up to an additional 380 MW of solar PURPA QF generation on-line, and Idaho Power anticipates that the Company will be able to utilize the actual operational data, in the same way it is able to use the actual operational wind data today, to verify and modify, if necessary, the calculation for solar generation contribution to capacity. Strictly specifying the ELCC methodology would eliminate the flexibility and transparency demonstrated by Idaho Power during the development of the 2015 IRP and the work that Idaho Power conducted with the IRP Advisory Council during the special breakout sessions dedicated to estimating the solar PV contribution to capacity.

Q. What are some of the pros and cons of the ELCC methodology?

A. One of the positive aspects of the ELCC methodology is that the ELCC is a theoretical calculation which, to date, has often been accepted as the theoretical standard. However, the ELCC has negative aspects as well. The ELCC requires extensive utility-specific generation and load data and the data may be proprietary or confidential. The ELCC calculations are often conducted by specialized utility technicians or specialized outside consultants on proprietary software and therefore the ELCC calculations are not easily replicated by outside parties. The ELCC calculations are iterative and complex and some of the current power supply, transmission, and demand-side models used by utilities may not be easily adapted to the complex iterative ELCC process. Finally, the ELCC calculations may not be well understood by members of the public, which may lead to legitimate concerns regarding transparency.

Q. Are there alternative methods for approximating the same results determined by the ELCC methodology?

A. Yes. Idaho Power believes that the methodology I described above is a very reasonable approximation for the same value for the contribution to peak of a renewable resource that would be determined by the ELCC methodology and, in fact, may be even more accurate than the ELCC for specific renewable resources on Idaho Power's system. Because of the complexity of the ELCC calculations, there has been considerable research on alternative approximation methods. Idaho Power agrees with NERC as written on page 24 of the March 2011 report, "Methods to Model and Calculate Capacity Contributions of Variable Generation for Resource Adequacy Planning":

> Milligan and Parsons (1999) [Milligan, Michael and Brian Parsons, Comparison and Case Study of Capacity Credit Algorithms for Intermittent Generators, NREL/CP-44022591, 1997?] compared the ELCC with a series of calculations for hypothetical wind generation to determine whether these simpler approaches are useful. Although several alternative methods were compared, the most straightforward approach was to calculate the wind capacity factor (ratio of the mean to the maximum) over several times of high system demand. The calculations were carried out for the

> top 1 percent to 30 percent of loads, using an increment of 1 percent. Figure 8 is taken from that study. Although an ideal match was not achieved, the results show that at approximately 10 percent or more of the top load hours, the capacity factor is within a few percentage points of the ELCC.

The key conclusion from this citation is "the results show that at approximately 10 percent or more of the top load hours, the capacity factor [as calculated by approximation methods] is within a few percentage points of the ELCC." As identified by NERC, there are other valid methods for determining the contribution to peak that are accurate and comparable to the ELCC methodology but provide far more transparency than the ELCC calculations. Idaho Power believes that the methods used by the Company to estimate generation contribution to capacity are accurate and comparable to the ELCC and the calculations used by Idaho Power are transparent.

Q. Should other alternative approximation methodologies be benchmarked against an ELCC calculation?

A. Idaho Power agrees that an alternative approximation should be verified by comparison with other calculations in order to assure acceptance by the public, independent generators, and regulators. However, requiring the alternative method to be benchmarked only with the ELCC appears to be overly prescriptive. There may be other accepted benchmarks published by independent parties that are equally valuable. Because the ELCC calculations rely on specific utility data that may be confidential or proprietary, and because the ELCC calculations may rely on proprietary software managed by the utilities, requiring the alternative method to be benchmarked only with the ELCC may result in the utilities being the only party capable of verifying their own ELCC approximations. Requiring an ELCC benchmark may not allow for sufficient independent oversight. The capacity contribution of a generation resource is presently an active area of study and there may be wellresearched alternatives to the ELCC prepared by organizations such as the National Renewable Energy Laboratory (NREL), WECC, Northwest Power and Conservation Council (NWPCC), California Independent System Operator (Cal-ISO), and others that are equally valid benchmarks.

Q. Should the Commission require that all utilities use the same calculation methodology in determining the contribution to peak of a renewable resource?

A. No, Idaho Power does not support requiring all utilities use the same calculation methodology. While there may be some value to using a single method from a regulatory point of view (i.e., ease of review by the Commission or Staff or other parties), the "one size fits all" approach may not be the best approach for accuracy and flexibility in determining the contribution to peak of renewable generation on each of the utility systems. There are significant differences between the utilities. For example, Idaho Power is a summer-peaking utility, Portland General Electric Company is a winter-peaking utility, and PacifiCorp has both summer-peaking and winter-peaking jurisdictions. Idaho Power is not certain that the exact same calculation method will be equally applicable to all three utilities.

Q. You state that a single approach may not provide for accuracy and flexibility in determining the contribution to peak of renewable generation. What does Idaho Power mean by "flexibility"?

A. Currently, determining a contribution to capacity means determining the value the renewable resource can reliably provide at the time of the Company's peak system demand. It is important to focus on overall system *reliability* during the entire year as it relates to the determination of the ELCC or an alternate approach, not just on peak. Historically, for Idaho Power, the time of system peak has been in July between the hours of 3:00 p.m. to 7:00 p.m. The system peak can be different for other utilities. However, as demand-side resources and solar generation play an increasing role in system management, the traditional system peak demand may not be the period of greatest reliability need in the future.

Q. What do you mean that the traditional system peak demand may not be the period of greatest reliability need in the future?

A. Demand Response ("DR") resources and, to a less extent, energy efficiency programs are not 24 x 365 days-a-year resources. As the DR and energy efficiency programs expand, the Loss of Load Probability ("LOLP") as it relates to the basis for determining the ELCC may not be the highest on-peak hour when all the DR and energy efficiency programs are designed to deploy. The greatest LOLP might be during hours in a shoulder month where the DR and energy efficiency programs are not as effective in reducing energy demand. Idaho Power currently includes significant DR resources as part of its resource adequacy planning. The DR programs are designed to shift load from hot summer afternoon hours with higher peak demands to evening hours with lower peak demands. In the future, the summer DR programs and solar generation additions may cause the shift of the planning deficit month from July to September, when DR programs are no longer in effect and solar production may be less. Currently, Idaho Power focuses the reliability of the contribution to capacity of renewable resources on the traditional summer demand peak hours. In the future, the times of greatest LOLP may change and Idaho Power, and other utilities, will need flexibility to identify and plan resources and programs accordingly, as well as fairly credit renewable generation with the contribution to capacity that renewable generation actually delivers.

Q. Please summarize Idaho Power's position regarding a preferred methodology for calculating a renewable generator's contribution to peak capacity.

A. Idaho Power recommends that any method to calculate the contribution to peak capacity for a renewable generator possess the following three characteristics:

1. Reasonable accuracy.
2. Transparent calculations.
3. Calculations that can be easily verified by an independent party.

While the ELCC is recognized as a theoretical standard, the ELCC method has significant limitations, including extensive utility-specific generation and load data, calculations that are iterative and complex and may not be easily replicable or adapted within current power supply, transmission, and demand-side models used by the utility, and the calculations may not be easily understood by members of the public, all of which may lead to concerns regarding transparency. Idaho Power has demonstrated in its own IRP planning process that approximation methods can be successfully applied to estimate the contribution to peak capacity for a renewable generator. Idaho Power agrees with NERC in quoting Milligan and Parsons "that at approximately 10 percent or more of the top load hours, the capacity factor [as calculated by approximation methods] is within a few percentage points of the ELCC." Other alternate methods have been, and will be developed, as experience is gained and conditions change. And while Idaho Power agrees that alternative approximations should be verified by comparison with other calculations in order to assure acceptance by the public, independent generators, and regulators, requiring the alternative method to be benchmarked only with the ELCC appears to be overly prescriptive. There may be other accepted benchmarks published by independent parties that are equally valuable.

Finally, flexibility should be maintained when determining the contribution to peak for a particular utility, given its specific electrical system needs and reliability concerns. A “one size fits all” prescriptive approach may not provide the most accurate and transparent measure being sought by this Commission.

Q. Does this conclude your testimony?

A. Yes, it does.