2.1.17 Prequalification is intended to: (i) ensure that a new capacity asset meets the minimum standards for a capacity asset; and (ii) verify that a proposed project prequalification package contains all of the supporting information necessary to assess delivery progress, apply the appropriate security requirements, and determine the form of capacity asset in order to apply the correct UCAP, availability, and performance methodologies to the asset.

2.1.18 A prequalified asset will be assigned a UCAP for the upcoming auction. If the UCAP for that asset is less than 1 MW the asset is not qualified to participate in the upcoming auction. However, it will remain prequalified for future auctions given that improvement in performance can increase UCAP above the minimum sizing requirement.

Prequalification for subsequent auctions

2.1.19 Prequalification of an asset is a one-time step, unless circumstances surrounding the asset change. Allowing prequalified resources to remain eligible for future auctions until delisted, modified, or deemed ineligible by the AESO gives the AESO certainty on resources that will participate in the auction and in determining supply adequacy. This approach also reduces the administrative burden of prequalifying resources each year for every base auction and rebalancing auction.

The modifications mentioned above include changes in self-supply status, refurbishment, and the addition of incremental capacity. A capacity market participant with incremental capacity must submit an incremental capacity prequalification application to the AESO prior to the auction in order for that incremental capacity to be included in the UCAP determination.

2.2 Self-supply designations

The concept of self-supply, a best practice found in other capacity markets, was leveraged to accommodate existing cogeneration and other sites in Alberta where load is served by onsite generation. Such sites account for approximately 2,000 MW of generation. This also recognizes the unique nature of Alberta's system.

2.2.1 Sites must be able to physically deliver capacity to the rest of the grid in order to meet the criteria that capacity contributes to reliability and is a physical product. The rationale for requiring certain sites to self-supply is as follows:

(a) The City of Medicine Hat is a site with onsite generation that is net metered at the connection to the Alberta Interconnected Electricity (AIES) system, and cannot physically flow their gross generation volumes due to system connection limitations. They must therefore self-supply. This includes generation not owned by the City of Medicine Hat located within the city limits.

(b) Sites that do not have revenue quality metering at the generator terminus cannot be measured accurately for the purposes of capacity market settlement.

(c) The Alberta capacity market is a physical market. The original criteria and assumptions for the design of the capacity market state that “a capacity obligation is a forward obligation on capacity suppliers that requires the capacity sold in the market to be available to provide energy production or reduced consumption when needed.” Based on this statement, sites with onsite generation that are net-metered and cannot physically flow their gross generation volumes to the grid due to system connection limitations must self-supply because they cannot physically deliver additional MWs to the system greater than that based on physical transmission limitations. Not all sites under this configuration are cogeneration sites and some manage their load with their own generation investments.

2.2.2 A site may choose to self-supply capacity provided they have a bi-directional net-interval meter at the connection point to the system. The bi-directional meter is necessary to accurately measure the net-to-grid energy in order to ensure delivery. Alberta's market does not have integrated utilities acting as load serving entities, as found in other capacity markets, but over 20% of the internal load is served by onsite generation. The capacity market design for Alberta must include consideration for this form of participant. Self-supply provides the market with a methodology to

deal with behind-the-fence (BTF)[7] locations with limited transmission capability. In addition, the ability to self-supply allows cogeneration sites that are tied to a host customer's load to be exempt from offering all of its capacity into the AESO-operated capacity market.

2.2.3 The 4 year requirement is intended to align with the proposed timing of the approval of the demand curve parameters to increase market certainty with respect to the demand curve. If the demand curve review cycle is shorter or longer than 4 years, the AESO will adjust this requirement accordingly. Self-supply volumes are not included in the procurement volume and therefore, the choice of whether or not to self-supply will impact the procurement volume. Stakeholders have suggested that the 4 year requirement is too restrictive and does not align with changes in operation and market conditions. In response to this feedback, the AESO will permit self-suppliers and capacity market participants to submit a change in self-supply status inside of the 4 years provided the self-supplier participant can demonstrate a physical change to the operation of the site. This allows reasonable certainty to be incorporated into the capacity market while ensuring that the capacity market structure does not negatively interfere with the business decisions of self-suppliers

2.2.4 *Stakeholder concerns related to self-supply*

An independent load and generator may pay, and are paid differently, from sites that are combined load and generation. Using a simple settlement example for the capacity market, it can be demonstrated that a site that is self-supplied will be allocated less of the reserve margin than a similar load without the ability to self-supply.

To demonstrate the payment difference when comparing gross settlement to net settlement, Table 5 below provides a simple system with four cogeneration sites (I1 through I4), 1 pure load site (I5) and one new entrant pure generator (A1). This example assumes a reserve margin requirement of 15% as the additional amount to procure in the capacity market to ensure reliability. The internal load of this system is 44 MW, adding an additional 15% brings the procurement target for this system to 50.6 MW of capacity less 18 MW of self-supply equaling 32.6 MW. The volume of self-supply is calculated as the difference between the sites gross load and its net load. The size of the resource procured to serve this sample of load portfolio is calculated as difference of the necessary amount for the gross load minus the sum of the generators' UCAP.

Once the capacity market clears, the load will be allocated the cost of the capacity procured. The cost allocation formula used here is the total payment to all capacity assets multiplied by the load of the site divided by the total load of all sites. The illustrative example includes both a gross load and a net load calculation. The payments that generators receive in this illustrative example assume a capacity market price of $40/MW (over a particular obligation period). The capacity payment is simply the capacity obligation multiplied by capacity market price. The example includes both a gross generation and a net generation calculation. The results of the example show that by allowing netting of the generation out of the load: (i) the rest of the load on the system (pure load represented by I5) will pay more than it would if netting were not allowed; and (ii) the loads that have cogeneration sites would pay less if short of generation, or the generators would be paid more if long on generation. Currently in Alberta 20% of the gross load is self-supplied.

[7] The AESO 2017 *Long-Term Outlook* defines BTF as "industrial load served in whole, or in part by onsite generation built on the host's site."

Table 4 - *Gross vs net settlement for self-supply*

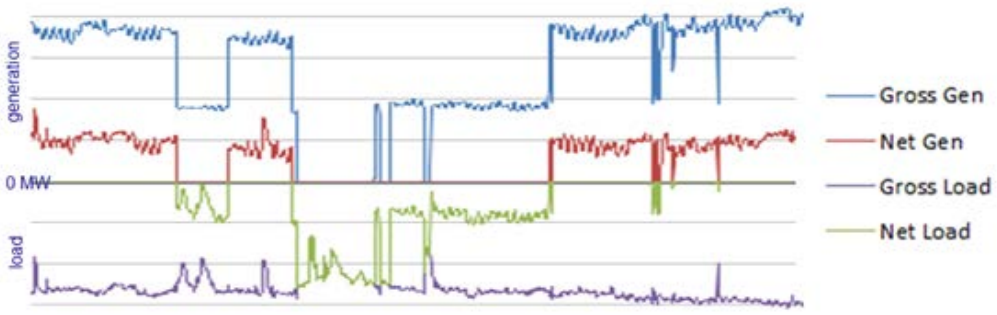
	Net		Gross		cost allocation				payments		totals		Volume of
sites	net load	net gen	gross load	gross gen	net	$	gross	$	net	gross	sum net	sum gross	Self-supply
l1	2	0	5	3	2.507692	$ 100	5.75	$ 230	$ -	$ 120	$ (100)	$ (110)	3
l2	0	3	3	6	0	$ -	3.45	$ 138	$ 120	$ 240	$ 120	$ 102	3
l3	4	0	8	4	5.015385	$ 201	9.2	$ 368	$ -	$ 160	$ (201)	$ (208)	4
l4	0	3	8	11	0	$ -	9.2	$ 368	$ 120	$ 440	$ 120	$ 72	8
l5	20	0	20	0	25.07692	$ 1,003	23	$ 920	$ -	$ -	$ (1,003)	$ (920)	0
Sum:	26	6	44	24	32.6	$ 1,304	50.6	$ 2,024	$ 240	960	$ (1,064)	$ (1,064)	18
A1	0	26.6	0	26.6					$1,064	$1,064	$1,064	$1,064	
Sum:		32.6	44	50.6	32.6	$ 1,304	50.6	$ 2,024	$ 1,304	$ 2,024	0		
amount to procure:			32.6	26.6									

In this example, the difference between the gross and net calculation, an additional 2.08 MW, is allocated to the pure load at a cost of $83 ($1003 to $920). This is because the netted load is not carrying their reserve requirement under the same level of reliability criteria as the rest of the system. The rationale submitted by the cogeneration owners for this acceptable difference is that cogeneration provides a reliability benefit due to the fact that the load and generation are tightly coupled. When looking in aggregate at Alberta industrial systems there is a correlation between the load and generation. In Figure 4 below, it is apparent that as the generation at the site drops the load drops too. This correlation makes sense as, by definition, the electricity is a by-product of the steam used in the industrial process. If no steam is generated, then no generation output is provided and no industrial process is supported by the cogeneration. Historical analysis of industrial system designation sites from 2012 to 2017 showed the reduction in generation was roughly 500 MW greater than the decrease in load. This is partially due to the fact that some industrial system designation sites are not cogeneration sites.

Determination of self-supply capacity

Self-supply volume is the difference between a site's gross load and net load. Depending on when that difference is measured the value can change dramatically. No reliability risks exist if it can be assured that in the event of generation failure during a performance event the load will be at its net-load volume levels. However, examination of historical individual net site behavior has not demonstrated this in all cases. Loads are not always reduced when the generation is down and we find net loads increase to gross load levels in some instances. In the example graph below, when the generation at the site (blue line) goes to or approaches zero, the net load at the site (green line) increases. The gross load at the site (purple line) remains relatively constant. Further analysis indicates 7 of the 15 current industrial system designation sites demonstrate a high correlation of their load and generation.

Figure 5 – *Net and gross measurements at a self-supply site*



Due to this observation, the AESO proposed four options to industry for mitigating this risk in the form of the following question.

How should the AESO determine how much capacity to procure for self-supplied load? Four options are listed below:

1. *The AESO does not procure capacity for the netted-out load and requires the net load to be curtailed during delivery events if not meeting their delivery obligation.*
2. *The AESO does not procure capacity for the self-supplied load, but charges the load at the value of lost load plus the curtailed loads capacity payment (liquidated damages) if they rely on the system under shortage events.*
3. *The AESO procures some capacity based on a probabilistic assessment of each self-supplier's dependence on the system's capacity market.*
4. *Apply the cost allocation formula to net load only. If a self-supplier takes capacity in a prior year they pay for it in the future year*.

Option 1 is a true form of opting out of the market and would not compromise reliability. However, there are very few self-suppliers that could utilize this option, and the cost of mandating this on all sites would be prohibitive. Options 2 and 4, which are variations on a similar theme, provide a financial incentive for self-suppliers to make sure assets manage their consumption during delivery events. The most important difference is that Option 2 sets a maximum load obligation that is assessed during delivery assessment periods, whereas the Option 4 cost allocation method is tied to cost allocation periods. Option 3 is a combination of Option 4 plus an additional premium, equal to some fraction of the system reserve margin percentage, placed on the self-supplied load to cover the risk of the load exceeding typical net levels during delivery events. This was seen by some stakeholders as incurring a double cost allocation and by the AESO as a highly administrative calculation requiring actuarial science to determine the right premium.

Option 4 was seen by a majority of the working group as the simplest method to manage self-supply as it is consistent with the current energy market treatment of generator station service load and net-measured sites. Some members felt this mechanism did not adequately address the reliability issue. The reliability concern comes from two places: (i) the method of cost allocation may not provide proper incentives for self-supplied load to not consume during system stress events if there is no alignment of delivery events and the times where costs are allocated; and (ii) the net load is highly variable, and most sites can incur non-coincident peaks in the hundreds of MW even though net loads are mostly in the tens of MW range.

With the high variability of net loads combined with the fact that these loads are large, the treatment of self-supply must ensure that appropriate incentives are in place to discourage self-supply loads from consuming during the capacity delivery assessment periods. To not do so could present a reliability risk.

Weighted energy cost allocation and self-supply

Generation used for self-supply can participate in the capacity market only on a net-to-grid basis, while the load it supplies will be subject to capacity market cost allocation based only on net-to-grid consumption. Concerns have been identified with the potential for self-supply loads to increase consumption due to onsite generation being off-line under the weighted energy methodology for cost allocation.

The weighted energy methodology for cost allocation reasonably and fairly apportions capacity market cost to loads that operate in a predictable and consistent manner. The methodology can also be compatible with creating incentives to ensure that self-supplied loads have sufficient incentive to curtail during conditions when onsite generation is reduced. For example, to provide an incentive for self-curtailment, a rate could potentially be designed whereby additional costs are allocated to loads when net-to-grid consumption is significantly higher than average under defined conditions. The additional cost allocation would not impact loads that operate with a "normal" load profile that do not exhibit periods of intermittent high consumption. The additional cost allocation would be expected to account for a small percentage of the total cost of the

capacity market. A market participant could avoid incurring the additional cost allocation by avoiding intermittent periods of high consumption. This is the incentive the rate design is intended to provide. Additional details will be developed by the AESO and subject to further consultation.

2.3 Delisting

2.3.1 For market transparency purposes, prequalified capacity assets that cannot participate in the Alberta capacity, energy and ancillary services markets for physical or economic reasons are required to temporarily or permanently delist from the Alberta capacity market. For clarity, "participation" refers to supply participation in the Alberta capacity, energy and ancillary services markets (i.e., providing energy production or demand response). A load that applies, prequalifies and obtains a capacity obligation to provide demand response is considered a supply of capacity The capacity market participant will have a must offer requirement in the energy market if the asset is committed to provide 5 MW or more in the capacity market in accordance with Section 10, *Roadmap for Changes in the Energy and Ancillary Services Markets* and a must offer in the capacity market in accordance with Section 5, *Base Auction*. As such, these demand response assets will be required to delist should they choose to no longer offer demand response. When a load delists it does not mean the load must no longer consume electricity or lose the ability to self-curtail their consumption. Self-suppliers that are net load and choose not to provide demand response are not considered to be participating capacity supply.

2.3.2 Capacity assets that are currently on extended mothball outages under Section 306.7 of the ISO rules, *Mothball Outage Reporting* ("Section 306.7") will be required to submit a temporary or permanent delist bid during prequalification for the first obligation period in order to remain offline. This will increase market information and transparency and will also facilitate the transition from Section 306.7, which will be amended to align with the delisting process.

AESO review of impacts to the reliability of the interconnected electric system

2.3.3 - 2.3.4

The AESO may review delisting submissions for reliability impacts and supply adequacy issues to ensure the safe, reliable and economic operation of the AIES.

Temporary delist request for economic reasons

2.3.5 Temporary delisting bids for economic reasons may be submitted during the prequalification period associated with the second rebalancing auction. The economic delist bid may be submitted after the asset has participated in both the base auction and the first rebalancing auction. It is only after participating in the base and first rebalancing auctions that a firm will be able to determine that the capacity asset has not earned sufficient revenue to remain economic. This notice period is in line with the notice period in Section 306.7.

The AESO acknowledges stakeholder feedback surrounding the requirement for a capacity market participant to offer into the base and first rebalancing auction even when it plans to temporarily delist its asset for economic reasons for the upcoming obligation period. As long as the offer reflects the net avoidable costs of temporary economic delist, the requirement that a temporary economic delisting request can only be submitted before the second rebalancing auction should not take away the opportunity for a capacity market participant to make arrangements to prepare, even in advance of the base auction, to temporarily delist the asset for the upcoming obligation period.

In addition, the requirement to submit a temporary economic delist request during the pre-auction period for the second rebalancing auction should not have an undue impact on the market outcome. If the offer clears in the base auction or first rebalancing auction for the upcoming obligation period, there is no economic reason for the capacity asset to delist for the upcoming obligation period. If the offer does not clear, the temporary economic delist request for the upcoming obligation period may be submitted before the last rebalancing auction relevant to the subsequent obligation period. As such, allowing economic delist bids for the second rebalancing auction only does not restrict an asset from economically delisting for more than one obligation period.