

GRAND HAVEN BOARD OF LIGHT & POWER

Sims Power Plant

Closure Recommendation Report



April 24, 2018

Executive Summary

The Grand Haven Board of Light and Power (BLP) recommendation to “begin planning for a June 1, 2020 closure of (the) Sims” power plant is based on the following facts:

- (1) The Sims power plant no longer provides the BLP an economical primary source of power. This can be verified by reviewing the last 12 years of plant operations and BLP wholesale power supply transactions. BLP retail revenue collections per kWh increased substantially during this period, at a rate far exceeding peer group, State, and National annual averages, primarily the result of increasing operating and maintenance expenses at Sims and lower wholesale sales. In 2015, the BLP possessed the second highest average retail rates (using this measure) among 28 lower peninsula Michigan municipal electric utilities. Since 2015, the BLP has been somewhat successful in lowering power production costs at Sims; however, the Sims power plant requires substantial investment and its output has become only marginally competitive.
- (2) The Sims power plant does not impact BLP customer reliability either positively or negatively – there is no correlation between maintaining operations at the plant and the reliability performance measures experienced by our customers. The Sims power plant was off-line 38% of the time over the last 5 years (calendar years 2013-2017). During this time the BLP received its power from the regional transmission network without experiencing a single grid related outage. Grid reliability will become even greater when the BLP’s ongoing multi-year phased 69 kV capital improvements are completed in 2019 and Network Integration Transmission Service (NITS) is obtained from the Midcontinent Independent System Operator (MISO).
- (3) The Sims power plant is small in comparison to most other operating coal-fired plants; however, it is “oversized” in comparison to the energy needs of the BLP. Maintaining a “diverse” multi-source power supply portfolio has been impossible with the Sims power plant producing such a large portion of the capacity and energy mix. As was noted in the Strengths-Weaknesses-Opportunities-Threats (S.W.O.T.) assessment contained in the BLP’s recent Strategic Plan, *“current power supply resources lack diversity and long-term dependability and are carbon intensive.”* Accordingly, the Board established the Strategic Objective in its plan to *“operate existing generation facilities efficiently and supplement such operations with effective wholesale market transactions. Additionally, **the GHBLP is committed to transitioning to a more sustainable, economical, and diversified power supply portfolio.**”* Setting a future date for Sims closure allows for short and longer-term power supply planning and is consistent with this established objective.
- (4) The Sims power plant cannot operate beyond 2020 safely, reliably, economically, efficiently and effectively without incurring substantial additional expense. Independent system assessments over recent years have identified **a minimum** of \$15 million of necessary repairs. This is not an all-inclusive figure. Plant management personnel that compiled these assessments and quotations are not suggesting if these repairs are completed that the Sims Plant can be operated longer. Other needs have also been identified for which costs have not been

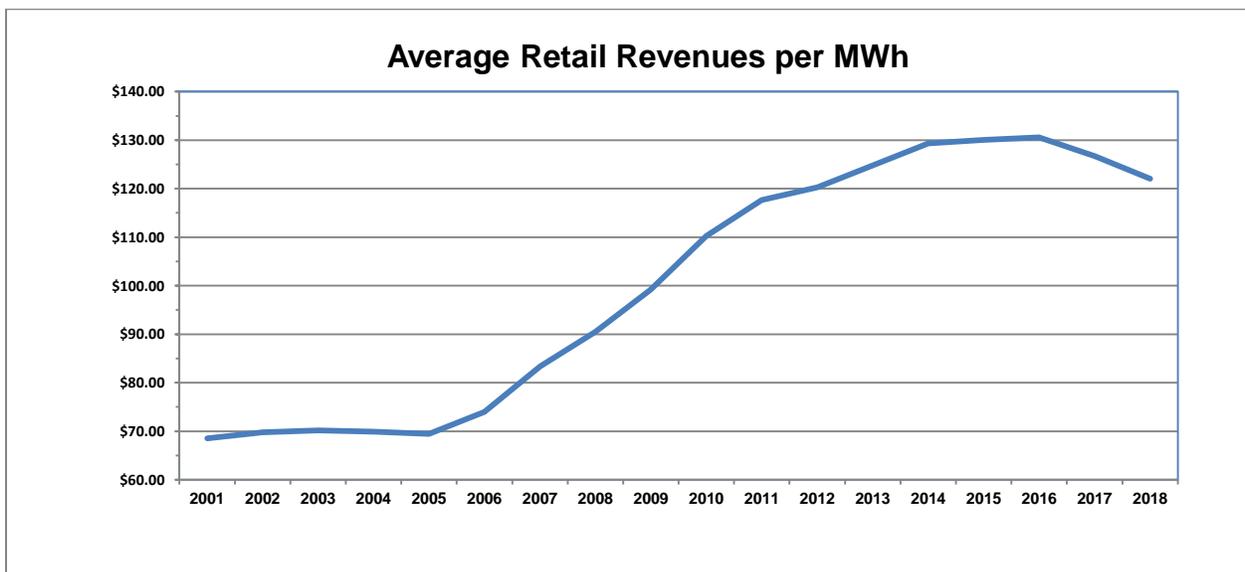
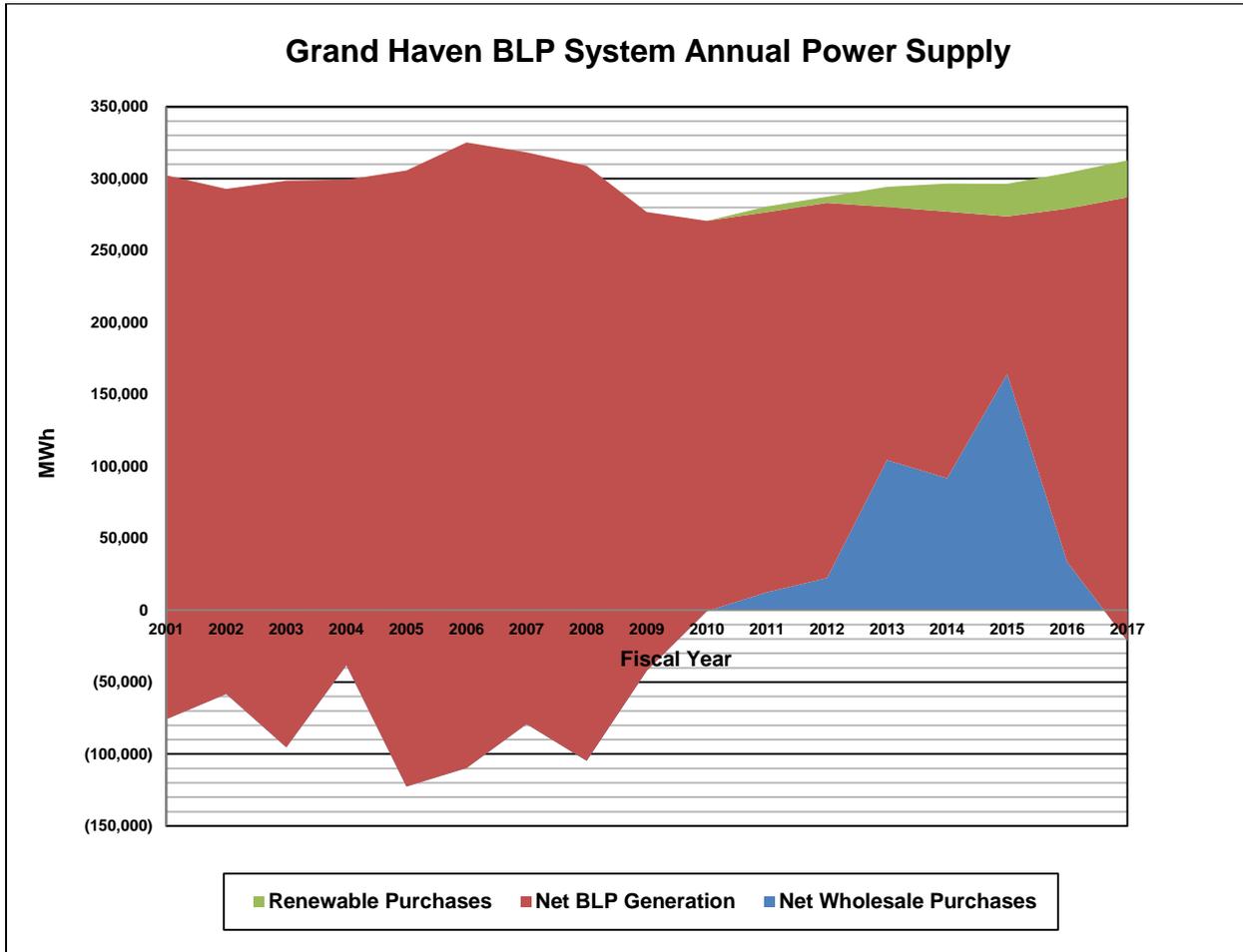
determined; therefore the \$15 million dollar requirements should be considered a floor or base and this number can be expected to increase significantly as more information is received and a more thorough assessment is completed. **No funds** have been collected in the current BLP approved rate structure or set aside in BLP cash reserves for these purposes; therefore, an immediate rate adjustment of no less than 16.4% would be necessary to begin funding these sizable expenses. Additionally, without completing **all** of the necessary work (that has been identified and that to be identified), one cannot assume the plant will provide a truly reliable and dependable local resource for any extended period, and it will continue to be a relatively expensive alternative.

- (5) The substantial risks and costs associated with continued operation of the Sims power plant far exceed any benefits, including any “ancillary” ones. These benefits include local employment at the plant, thermal heat production for the City’s snowmelt system, impacts on payments in-lieu taxes to the City’s general fund, and any funding differential for harbor dredging that may result from the elimination of coal deliveries to the plant (among potentially others). The BLP understands the importance of these items. These issues all need to be proactively addressed as the BLP moves forward in its plan to close the plant by June 1, 2020. Some changes made necessary by the closure of the Sims power plant in the time-frame proposed may actually provide opportunities to address these issues before they become larger ones. However, it is apparent at this early juncture, the collective financial impacts of these ancillary benefits in total will not overcome the cost justification to cease operations of Sims power plant.
- (6) The Sims power plant closure plan is consistent with identified customer sentiment. An independently conducted 2017 BLP Customer Satisfaction study and two recently held “Business Forums” with the system’s largest customers show support for retaining local generation, however, a significant majority of those in support are unwilling to pay more than a 5% rate premium for local generation. When BLP customers asked more specifically, if it was determined that the presence of local generation would not substantially impact customer reliability, support was similarly reduced. Given the identified costs and reliability impacts of the Sims power plant, it would seem customer support for its continued operations is low, particularly after customers learn of these impacts. Additionally, there is substantial local public support for transitioning away from coal to “cleaner” power supply alternatives, particularly if this goal can similarly be accomplished without significantly impacting rates or reliability.
- (7) Substantial environmental regulatory compliance costs may be avoided by establishing a firm date of closure on June 1, 2020. Environmental rules and regulations related to coal-fired power plants continue to change and evolve over time. Several environmental regulatory requirements are being implemented that will impact the Sims power plant in the near term. Announcing a firm future closure

date within the confines of existing environmental rules may have the effect of reducing compliance costs over the remaining life of the facility.

- (8) The BLP can and will continue to meet the community's expectations for quality local electric service that returns value to its customers and the community as a whole without operating the Sims power plant beyond June 1, 2020 (the BLP's established mission). Many studies have determined the greatest value produced by smaller municipally owned electric utilities stems primarily from their distribution system operations, administrative procedures, and not-for-profit financial opportunities along with their ability to "aggregate" customer loads to collectively access a portfolio of generation and purchase power options. While there may be added value to be provided by new local generation options in this portfolio approach, the BLP's "joint action" agency, the Michigan Public Power Agency (MPPA), and potentially other partners, can no doubt provide further value (above the potential of the BLP acting alone) in the areas of generation and transmission. It is consistent with the BLP mission to determine where it can best utilize their resources and provide the most "added value" to its customers. The BLP will effectively continue in its mission far after the closure of the Sims power plant.

(1) The Sims Plant no longer provides the BLP an economical primary source of power



The above two graphs depict changes in the utilization of the Sims power plant and the resulting impact on the BLP average retail revenues per Megawatt-hour (MWh) over the time period from Fiscal Year 2001 to that anticipated for 2018.

As illustrated by the power supply graph, the 5-year period from fiscal year 2001 to 2005 marked a period of relative stability in the operation of Sims. Net wholesale sales (total wholesale sales less total wholesale purchases) from the system over this period averaged 84,259 MWh and retail sales averaged 297,599. Slight average growth occurred over the period, peaking in 2005 with 122,557 MWh in net wholesale sales and 305,684 MWh in retail sales volume.

BLP average retail revenues per MWh (i.e. total annual retail revenues collected from all customers of the system divided by the annual volume of energy sold to them in MWh) during the period from fiscal year 2001 to 2005 were additionally stable, averaging approximately \$70 per MWh (or 7 cents per kWh), essentially equal to the Michigan average of all utilities over this period. The BLP “peer group” municipal utilities of Bay City, Coldwater, Marquette, Traverse City, Wyandotte, and Zeeland also averaged about 7 cents/kWh during this period. The United States national average retail revenue for “full service providers” during this period was approximately \$73 per MWh.

Noteworthy as well, the BLP collected average “capacity” payments (fixed monthly payments provided by the power pool to keep BLP excess generation available to the pool) of nearly \$1.2 million dollars annually, in addition to variable cost plus margin “energy” wholesale sales transactions during the period.

The next 10 years, from fiscal year 2006 to 2015, marked “progressive underutilization” of Sims. With Sims capacity approximately twice the hourly average BLP system load, decreasing margin and volume from wholesale energy sales transactions required increasing retail revenues to recover increasing Sims operational expenses (including significantly increased fuel costs). Fortunately, continuing capacity payments averaged almost \$1.5 million dollars annually from fiscal year 2006 to 2011; however, with the termination of Michigan Public Power Agency (MPPA) power pool operations December 31, 2010, these capacity payments dropped to almost zero thereafter.

After decreasing from fiscal year 2006 to 2010, retail sales volume grew slowly from 2011 to 2015. This growth was insignificant compared to the continued changes in net wholesale energy transactions. From 2005 to 2015 net wholesale transactions “from” the system decreased from 122,557 MWh in **sales** in 2005 to zero in 2010; and then wholesale system **purchases** grew to 186,848 MWh to supplement Sims production in 2015. State renewable energy purchasing requirements further reduced demands on Sims, with system “green” energy purchase volume growing from zero in 2010 to 22,717 MWh in fiscal year 2015 (included in total 2015 net wholesale purchases above).

As capacity payments disappeared, Sims operational and fuel costs continued to increase, and production levels plummeted. As the plant utilization decreased, the efficiency of

continued plant operations also decreased (as measured by increases in demonstrated Sims heat rates). Sims was designed for “baseload” operations with much higher utilization factors.

The average loading on Sims during operational hours in calendar years 2010-2014 was 31 MW, less than one-half the plant’s demonstrated net capacity. These problems were further intensified by the decreasing cost of other market power suppliers (driven by lower cost “fracked” natural gas prices and decreasing renewable energy project costs). In other words, as Sims costs were increasing, its “competitors” in the wholesale marketplace were lowering their costs and prices.

Needed investments in the plant to prolong Sims life were postponed during these years; funding them would have resulted in even higher retail rate increases for investments that were difficult to cost justify. When the plant required repairs, it was fixed; however, the costs associated with a more proactive longer-term preventative maintenance program and a life-extending capital improvement plan was prohibitive. The availability of the plant (operational hours over total hours) reached an all-time low in calendar years 2013-2014 when the plant was on-line only 9,877 hours (or 56% of the 17,520 hours in the two-year period), primarily a result of forced outages to make repairs.

BLP necessary retail revenues per MWh ballooned from 2005 to 2015 primarily driven by increasing plant expenses and decreasing wholesale sales. During the six years from 2006-2011 the average annual growth rate of retail revenue dollars per MWh sold increased **9.2% per year** (from \$69.44/MWh in 2005 to \$117.68/MWh in 2011). The average compounded growth rate over the period from 2005 to 2015 was approximately 6.5% per year for ten consecutive years. Reviewing Energy Information Administration (EIA) reported data illustrates the BLP went from being essentially at the State average during the period from 2001-2004 to 17% above the Michigan “full service provider” average in 2015 (and 30% above the average of its six member peer group of Michigan municipal electric utilities identified above). Additionally, **this 2015 EIA data shows BLP average retail revenues per kWh 8.3% above Consumers Energy and 27% above the national average.**

During fiscal year 2015, significant repairs to the Sims plant were completed. The replacement of the remaining rear wall tubes in the boiler, significant pulverizer repairs, and a “major” spring overhaul (including steam turbine work) marked over \$5 million dollars of repair, maintenance, and capital investments during the year (excluding BLP labor costs).

These investments, along with the BLP’s last plant debt service payment being made on July 1, 2016, brought one “**last opportunity**” to try to make Sims financially viable over the remaining life of plant. Management, in collaboration with MPPA, developed a new “must run” schedule to better optimize the plant’s operating characteristics and improve demonstrated heat rates. The revised operating schedule incorporated an 8 week planned spring and 8 week planned fall outage that reduced forced outage rates, scheduling maintenance downtime when it was most economical to do so. An innovative wholesale purchase and sale strategy to “trade” energy with the market was implemented, buying during outage periods when purchase prices were expected to be lower, and selling to the market during operating periods when wholesale energy was projected to be higher priced.

During the 796 day period from January 1, 2016 to March 6, 2018, the BLP evenly matched its wholesale sales from Sims with its short-term market energy purchases (netting the volume and cost of wholesale transactions, excluding renewable purchases, to near zero), while lowering the net heat rate of the Sims power plant from almost 13,900 btu/kWh (average demonstrated over the fiscal year 2011-2014) to approximately 11,800 btu/kWh during this period, a 15% improvement in plant fuel efficiency per kWh. The United States coal “fleet” average heat rate, however, is approximately 10,800 btu/kWh. Therefore, even with what can be considered a very successful implementation of these changes in operations, the Sims power plant demonstrated heat rate remained about 9% above the U.S. average. Sims was operating almost 29% above this average heat rate threshold for the five-year period from FY 2011-2014.

The following highlights the differences in Sims operational data over the last 5 calendar years (before and after implementation of the operational changes highlighted above):

Sims Power Plant Operations Summary Five Year Period from 2013 – 2017

<u>Calendar Year</u>	<u>Hours Operated</u>	<u>Hours in Year</u>	<u>Availability Rate</u>	<u>Net MWh Generated</u>	<u>Average Loading (MW)</u>	<u>Utilization Rate @68 MW Capacity</u>	<u>Annual Capacity Factor</u>
2013	4,265	8,760	48.69%	123,690	29.00	42.65%	20.76%
2014	5,612	8,760	64.06%	174,464	31.09	45.72%	29.29%
2015	5,370	8,760	61.30%	200,872	37.41	55.01%	33.72%
2016	6,038	8,784	68.74%	283,030	46.87	68.93%	47.38%
2017	5,806	8,760	66.28%	273,328	47.08	69.23%	45.89%
2013-2017	27,091	43,824	61.82%	1,055,384	38.96	57.29%	35.42%

Availability Rate = Percent of annual operating hours out of all annual hours

Utilization Rate = Average annual loading as a percent of demonstrated net plant capacity

Capacity Factor = Actual annual production as a percent of maximum annual production (if plant was running at capacity for the entire year) Availability Rate x Utilization Rate = Capacity Factor

Notes

- (1) Lower availability in 2013 and 2014 was primarily the result of forced outages
- (2) Forced outages in 2016 and 2017 were significantly lower than in 2013 and 2014. Availability in 2016 and 2017 was primarily impacted by planned outages in spring and fall
- (3) Generally in 2013 and 2014, while Sims was operated, it was scheduled to follow load
- (4) Generally in 2016 and 2017, while Sims was operated, it was scheduled as must run approximately 12 MW above expected load
- (5) In 2016 and 2017, total MWh sold to the market approximated total purchases from the market (about 200,000 MWh in total in each direction over the two years)
- (6) Running Sims at average loading 17 MW higher in 16-17 resulted in heat rates about 2,000 BTU/kWh lower as compared to 13-14
- (7) Over the five year period, the Sims III unit remained offline, unable to meet system load, about 38% of the time
- (8) The overhaul conducted in the spring of 2015 marked the last time the steam turbine was opened, inspected, and repaired

- (9) A "baseload" unit such as Sims is designed to operate at a higher utilization rate and capacity factor - extended operations at lower capacity factors are not economical

The BLP has utilized Black and Veatch (B & V) monitoring and diagnostic services and ASSET 360 software platform for the last year and half. B & V engineers and technicians have monitored Sims 24 hours per day, alerting operators when they feel a problem may be developing and making recommendations on any efficiency improvements they feel may be appropriate. This service has proved beneficial in assisting our operators and plant management in making these changes; however, B & V also continues to note higher "unburned carbon" levels in our ash, suggesting the Sims power plant is still not as effective as it should be in fully combusting coal to more efficiently produce electricity. Noteworthy, B & V was also the original design engineering firm for the Sims 3 unit.

Sims fuel costs were also renegotiated downward for coal deliveries in calendar years 2016 and 2017. The operational changes and fuel cost reductions were quite successful in reducing fuel and fuel related expenses from nearly **\$50/MWh** before 2015 to approximately **\$35.50/MWh** during this 796 day period (a 29% reduction). These cost reductions were passed through to our retail customers through the Power Cost Adjustment (PCA) mechanism contained in our rates, helping to reverse the trend of rate increases experienced from 2005-2015, and actually contributed to lowering retail revenues per MWh in fiscal year 2017 and 2018. The "avoided cost of electricity" for the MWhs produced by Sims over this period was approximately **\$32/MWh**; however the BLP was able to lower its transmission costs by producing more energy "behind the meter."

Although staff at the plant has been very successful in carrying out these cost reduction strategies, and should be commended for doing so, their efforts were determined to be "too little too late." **Sims requires substantial investment and its output has become only marginally competitive** (and that competitiveness remains almost entirely dependent on transmission related savings). There are times when Sims variable costs are less than the avoided cost of energy; however, financial benefits produced by Sims during these times are insufficient to justify maintaining operations when they are not, particularly if the impact of known needed repair costs are included in the analysis.

(2) The Sims power plant does not impact BLP customer reliability

Many in the Grand Haven community believe the reliable electric distribution system they have come to expect depends on maintaining Sims as a local power supply resource. This is quite simply not true. The facts support this conclusion. There is absolutely no correlation of forced outages at the Sims power plant with customer outages measured and reflected in the BLP's reliability performance metrics. Customer outages are primarily the result of distribution related issues (storm, wind, and ice damage, distribution equipment failure or malfunction, auto accidents, animal caused outages, vegetation management issues, underground digging, etc.). The duration of these outages is related to how quickly utility personnel can respond and repair the issues. The presence, or lack thereof, of a local generating resource has not impacted BLP customer outages or their duration. If this were not the case, the BLP's reliability performance

metrics would have gone down with the higher forced outage rates and lower availability rates actually experienced at Sims during the five year period from 2010 – 2014. No BLP customers lost power for any duration of time during this period as a result of Sims power plant performance.

The local transmission system has been proven more than adequate to supply our distribution system without interruption during all planned and forced outages of the Sims power plant. In fact, a recent review of BLP operational records did not reflect a single instance where the “grid” was not available to support the full load requirements of the BLP during periods while Sims was not operating – and as was noted in a previous section, Sims was off-line about 38% of the time over the last five-years.

Wolverine Power Supply Generation and Transmission Cooperative and ITC (International Transmission Company) own, operate, and maintain the regional transmission system around Grand Haven and it is operated under the functional control of the Midcontinent Independent System Operator (MISO) – not Consumers Energy as many believe. Regionally, transmission owners, under the direction of MISO, have been investing significant and increasing amounts of capital over more than a decade across the entire MISO footprint. As most in the industry know, the rate of investment in transmission has far exceeded that of distribution or generation. More locally, Wolverine has recently rebuilt their supply line from the south into Grand Haven and is planning to invest over \$50 million dollars in additional improvements south of Grand Haven in the next two years, further strengthening the supply lines into our system.

Despite these substantial improvements, some may still say that backing up the grid with Sims is better than sole reliance on the grid for our power supply. In other words, some local generation back-up, even if it is costly and not that reliable, is better than none at all and it should be retained. This too requires a more complete assessment. Sims is primarily operated as a “synchronous” generator, operating in-synch with grid frequency and voltage, not independent from it. In the rare circumstance the entire local transmission grid was lost for some reason, Sims would likely go off-line with the loss if it were operating at the time. Whether Sims could be restarted and operated as an “island” independent from the grid for extended periods hasn’t been attempted and none of our operators have been trained in such circumstances.

Western Ottawa County has an abundance of grid connected generation resources and multiple transmission paths from them (CECO Campbell Generating Complex in Port Sheldon, CECO Zeeland Generating Plant, HBPW and ZBPW generation facilities, in addition to the BLP Sims and Diesel Plants). The BLP current generation capacity of approximately 76 MW represents 2.8% of the total of over 2,700 MW of generating capacity in Western Ottawa County, which is far in excess of the approximately 500-600 MW of collective peak load in the same area. In other words, Grand Haven is located in a portion of the grid that possesses substantial excess generating resources. This redundancy and local area resource adequacy are then essentially unchanged with the elimination of all BLP generation. Adding or subtracting a relatively small generation facility has little or no statistical impact on the local grid reliability

unless there are “constraints” within the system near that resource; MISO and transmission owners, not the BLP, are tasked with identifying these constraints and eliminating them for network transmission users.

When BLP contracts to buy power from a remote facility, this power is not actually delivered to Grand Haven from this generator. Power flows from generators to loads taking the “path of least resistance,” regardless of the contractual path of a particular transaction. The independent system operator ensures **total** system generation and loads are continuously matched in real time, not portions of it. If the BLP contracts to receive power from a wind farm on the other side of the State (as it has), the reliability of its power supply and grid interconnections are not impacted locally in the least – as the physical configuration of the grid in the area has not changed as a result of the transaction. Financial and contractual settlements for power inputted into the system and taken out of the system occur after the fact.

The actual physical configuration of the local interconnection to the network (and its associated “reliability”) is completely independent from the contractual/financial arrangements a market participant served at a point on the grid has made for capacity and energy.

Generation and transmission system equipment configuration and “redundancy” determines the reliability of power supplied to a point on the transmission grid. System planners use complex probabilistic and statistical analysis to model “loss contingencies” and determine if system components (generators, transformers, lines, etc.) can be taken off-line for whatever reason and determine if service can be maintained during various operating conditions to that point.

The operations of BLP existing generating facilities have had very little impact (if any), either positively or negatively, on the “reliability” of power supplied to the BLP distribution system. The BLP should focus its resources **first** on those reliability factors that it can control and influence more cost effectively. These efforts should be primarily distribution related.

The BLP Board, in its Long-term Power Supply Planning Key Policy Statements approved in September 2015, stated, “as the BLP will no doubt become more dependent on the regional transmission grid for its longer-term power supply needs as Sims III generates less, the Board desires to evaluate and improve as necessary the system’s interconnections with the high voltage transmission system to ensure a reliable future power supply.”

This direction was echoed in Hometown Connections’ Organizational Check-up of the BLP conducted in late 2015. In its “Distribution Operations” section of the report dated January 6, 2016 (where the BLP was assessed two out of four stars), Hometown makes the following recommendations:

- (1) *Hometown recommends that the BLP continue to replace its 2.4 kV system and establish a target date to complete this conversion*
- (2) *BLP should review its processes, practices and renewal efforts to bring its (distribution) asset management program up to date with industry standards*
- (3) *Hometown recommends BLP expand its tree trimming program into a more comprehensive vegetation management program*

- (4) *As part of its overall process of improvements, BLP should step up its game in substation maintenance and renewal*
- (5) *Hometown would encourage BLP to better track system line losses and benchmark against itself and industry peers*
- (6) *Hometown recommends BLP consider joining the growing number of utilities using APPA's eReliability Tracker*
- (7) *Hometown recommends that the BLP upgrade its customer and distribution software to industry standards*
- (8) *Hometown recommends the implementation of an inventory tracking system along with assigning a responsible party to oversee warehouse operations and inventory*
- (9) *Hometown recommends a review of substation security and actions to provide additional security at these locations*

The "Weaknesses" section of Strengths-Weaknesses-Opportunities-Threats assessment contained in the BLP 2017-2021 Strategic Plan notes the following:

The BLP infrastructure is aging and requires significant investment over the foreseeable future. Current grid interconnections and sub-transmission assets are inadequately sized to meet peak system demands (within the contingency analysis discussed above) without running local generation.

The BLP approved Transmission and Distribution Strategic Objective in the plan is to "design, construct, operate and maintain a safe, reliable and modern transmission and distribution system that provides adequate capacity for future load growth and supports a diverse power supply portfolio."

Accordingly, within the BLP's more recent capital planning, it has directed substantial investments into these prioritized distribution areas, and away from further significant investments into Sims. Now redirecting capital funds away from these distribution related areas and back into revitalization efforts of the Sims power plant would be contradictory to past Board direction and would have negative impacts on future customer reliability, more so than that gained by maintaining Sims operations for a few more years.

The noted "weakest link" in the BLP's interconnection with the regional transmission system is the BLP's own 69 kV "backbone" power line that connects the BLP's three distribution substations to Sims and the ITC/Wolverine transmission network – and the contracted transmission system service/tariff level the BLP has selected to obtain (essentially an "interruptible" point-to-point service as opposed to "firm" network service).

The BLP is in the second year of a three-year phased project to rebuild the backbone of the system; the final phase will be completed in 2019. Additionally, the BLP has filed a request with the Midcontinent Independent System Operator for "firm" Network Integration Transmission Service (NITS) effective June 1, 2020, concurrent with the recommended shutdown date of Sims and the last remaining unit at the diesel plant. Most utilities, including almost all Michigan municipal utilities, Detroit Edison, and Consumers Energy use NITS.

In addition to these improvements, the BLP remains committed to continuing its investigation and analysis of the installation of some local generating capacity to address concerns associated with a “loss of grid” scenario and to provide other potential benefits to the system. Any recommended local generation facility will be more cost effective and will perform better than Sims in these circumstances. The continued operation of Sims until such a plant may be developed and constructed adds very little, if any, system protection and only adds significantly to the cost of the power supply portfolio that may be developed in its absence.

(3) The Sims power plant is small in comparison to most other operating coal-fired plants; however, it is “oversized” in comparison to the energy needs of the BLP

At a demonstrated capacity of approximately 70 Megawatts (MW), the Sims power plant is one of the smallest utility coal fired power plants that remain in operation in Michigan; it is however, quite large in comparison to the BLP’s 35 MW average hourly system demand (twice as large).

All means of electric generation typically experience “economies of scale and scope.” Sims has had to overcome this fact since it was originally installed. Smaller generation facilities typically possess higher unit installation costs (measured in \$ per kW of installed capacity) and are less operationally efficient as measured in their heat rate (thermal units of necessary fuel input to generate a kWh of energy). The balance then for small utilities with lower average loads is gaining access to generation resources large enough to possess scale without having any one resource so dominant that it doesn’t allow for diversity in its power supply mix.

Small utilities acting alone almost always struggle to gain the “critical mass” necessary to access larger at-scale power supply opportunities, and still achieve the desired diversification to maintain multiple resources within their portfolio and reduce risk. This is most problematic in “baseload,” or around the clock, power applications, since this is where the majority of the power a utility uses is generated. Baseload facilities are typically the largest and most efficient plants – having lower variable costs and higher initial installation unit costs.

Sims was designed as a baseload facility and needs to be run as such to remain economical (operated around the clock at high utilization and capacity factors). When it is not, as Sims was operated during the 5-year period from 2010-2014 (discussed in Section 1 above), it is even less competitive against larger generators using the same fuel and technology. This is easily confirmed by reviewing the heat rates demonstrated by smaller, as opposed to larger at-scale units, using similar technologies operated in a similar fashion.

With an average annual BLP system load of 35 MW, operating a 70 MW baseload facility has simply not allowed BLP to diversify its power supply portfolio to any extent. When the utility was forced to diversify somewhat using renewable energy, with the implementation of Michigan’s Renewable Portfolio Standard (RPS) in 2010, the BLP was “stranded” with even more high cost excess capacity it could not utilize internally. Michigan is raising its RPS from 10% to 15% over the next several years. The closure plan for Sims will allow for this transition, as well as allowing for further diversification of its power supply over multiple technologies and

fuels As long as the BLP doesn't decide to replace Sims with a similarly "dominant" power supply option that produces the majority of electricity the system needs.

The BLP is quite unique among utilities in owning and operating a singular facility, at a single site, utilizing a single shaft and a single fuel to produce the majority of its power needs. This operation brings with it significant risks of supply and volatility in price. The BLP has recognized this fact multiple times during its long-term power supply planning efforts.

The Board's desire to "diversify" its power supply portfolio is by no means new nor was it brought about by the arrival of a new General Manager in January of 2015. The Board's **2014** approved "Key Policy Statements" suggest:

The Board is willing to pursue conversion from coal to other energy sources as justified by cost, emissions and environmental impact.

In 2015, the Board will begin the process in earnest with the BLP's new General Manager that will lead to the conversion of our energy source from coal to cleaner technologies. Our goal is to reduce our reliance on coal by 50% or more by 2020 and by 100% by 2024 if possible. (This revised point was proposed by Director Naser to address his concerns that previous policy statements were not moving away from coal with enough "urgency." The revision was passed unanimously by all 5 BLP Board Directors present September 18, 2014.)

The BLP's current recommendation to close the Sims power plant in 2020 is entirely consistent with this earlier 2014 Board direction of a **50% or more reduction**; however, it is additionally based on the critical recognition that "progressive" reductions in the utilization of a baseload facility are simply impractical and unsustainable at some point. To be efficient and effective, a baseload facility needs to run at higher capacity factors or shut down entirely, not progressively reduce "reliance" over time as suggested in the policy statement above. The 2014 Board policy statement proposed a 50% or more reduction (one can only assume a reduction as compared to the then current utilization of Sims) by 2020. Since the two year 2013-2014 Sims capacity factor was an already low 25%, implementation of the policy statement as written would have driven the 2020 capacity utilization of Sims to less than 13% of its annual capacity. No baseload plant can be run effectively and economically at a capacity factor this low.

In August and September of 2015, the BLP Board discussed and approved revised "Long-term Power Supply Planning Key Policy Statements." In this document, the Board recognized that it is "*entering a period of future uncertainty regarding its existing power supply alternatives (Sims III and the diesel plant)*" and "***the Board desires, given its current reliance on Sims III to meet the majority of system needs, to transition to a cleaner, more diverse, less carbon intensive, generation and/or purchased power supply mix of resources.***" Further, these statements reflect the Board's desire at that time to "*evaluate supplemental power purchases beginning in 2018.*"

In the Executive Summary of the Hometown Connections Organizational Check-up of the BLP of January, 2016, Hometown notes the following:

As its customer base has evolved over the years, so has the utility industry and in particular the power supply space. Throughout its history, the BLP has owned and operated its own generation. While this may have served its customers well in the past, with changing regulations and market conditions, BLP faces new challenges in the area of power supply generation and delivery. While locally owned and operated generation is laudable, the changing power supply market including the maturation of organized markets, regional transmission operators and a host of new compliance requirements, makes owning and operating generation assets more complicated today. The BLP is facing significant power supply decisions in the not so distant future. With this said, Hometown Connections commends the BLP on the recent addition of its new general manager who brings a power supply skill set to the utility that it may not have had in the past.

Although a thorough reading of the entire Power Supply Section of the Organizational Check-up is applicable here, Hometown Connections' underlined recommendations in that section are particularly noteworthy. They are:

- (1) As BLP reviews its future power supply options, it should consider more diversification in its power supply including number of generating units, fuel type, ownership alternatives, and location.*
- (2) While BLP may spend a portion of this (approximately \$8M/year Debt Service) on power supply resources, a (significant) portion of this windfall should be directed to distribution system renewal which is addressed in the Distribution section (of the Hometown Connections report)*
- (3) BLP is fortunate to be a member of MPPA and should work with them on future power supply and transmission capacity needs.*

The "Weaknesses" section of Strengths-Weaknesses-Opportunities-Threats assessment contained in the BLP 2017-2021 Strategic Plan notes the following:

Current power supply resources lack diversity and long-term dependability and are carbon intensive.

The Strategic Objective established in the area of "Power Supply" within the Strategic Plan addresses this weakness more specifically suggesting:

GHBLP will operate its existing generation facilities efficiently and supplement such operations with effective wholesale market transactions. Additionally, the GHBLP is committed to transitioning to a more sustainable, economical, and diversified power supply portfolio.

In other words, operate the BLP facilities as efficiently and effectively as possible for their remaining life, supplement this production with cost effective wholesale market

transactions, and begin “transitioning” away from existing BLP resources to a more diversified portfolio.

The General Manager reviewed results of the Hometown Connection Organizational Check Up, Utility Financial Solutions Cost of Service Study and rate recommendations, and final Board approved Strategic Plan at the joint meeting of the BLP and City Council May 19, 2016.

The proposed closure of the Sims power plant is again entirely consistent with established objectives within the Board approved strategic plan and presents the BLP with a strategic opportunity to build a truly diversified power supply portfolio for the first time in its history. To do so, the BLP will need to partner with others, public and private, to gain the necessary scale and scope (and diversification) in its power supply options as it hasn’t before.

Other municipal utilities of similar and smaller size have been successfully accessing the power supply marketplace “jointly” together for at least portions of their portfolio for some time. The BLP’s staff recommendations presented in February includes working with the Michigan Public Power Agency (MPPA) to build an individualized power supply portfolio, based on this recognition. This recommendation is consistent with the Hometown Connections recommendations above. MPPA was created by its municipal utility members, including Grand Haven, under State law for exactly this purpose – facilitating “joint action” between municipally owned electric utilities to gain the scale and “critical mass” none would have alone and assisting members in maintaining balanced, economic, and diversified power supply portfolios.

(4) The Sims power plant cannot operate beyond 2020 safely, reliably, economically, efficiently and effectively without incurring substantial additional expense

The management and employees of the Sims power plant have recently collected, reviewed, and analyzed a number of independent assessments performed over the last several years on various component systems within the facility. This process has resulted in identifying over \$15 million dollars of necessary repair items. These efforts are not to be considered an exhaustive comprehensive assessment nor should the conclusion be taken as an all-inclusive figure. Further, plant personnel that compiled these assessments and quotations are not suggesting if these identified repairs are completed that the Sims power plant can be operated any longer. Other additional repair needs have been identified for which costs have not been determined (and are not included in the \$15 million dollar total). Therefore, this figure should be considered a floor and increases above this point will no doubt occur as more information is received and a more thorough assessment is completed (if one is to be done).

All at the plant (management, supervisory staff, and union employees) have come together in their assessment that without making necessary investments, Sims cannot continue to run safely, reliably, and economically beyond June 2020. To be clear, operating to this date will be a challenge as well, requiring changes in the BLP’s operating schedule and planned loading of the unit. Some expensive repairs will no doubt be required to only continue operations until 2020. This assessment is not in dispute among those that know the plant best.

Additionally, there is ample concern that some decision-makers do not fully understand the severity of the issues associated with the plant's condition. It cannot be understated here.

Continuing to run the Sims power plant past June 2020 would require immediate planning and substantial investment. Just completing the repairs on a portion of the identified issues will not be enough. If this is the path the community desires, a more comprehensive engineering plant condition assessment will be required, a longer-term schedule to complete these repairs will need to be developed, and a financial strategy will need to be implemented to fund the measures needed (that are now known and for those that may be determined necessary later). Taking on debt to finance a short-term life extension of the Sims power plant is not an option. There is not a guaranteed life-extension period long enough to appropriately amortize the cost of these repairs. The BLP has already eliminated capital spending at the plant and all previous capital projects will be fully depreciated by the end of fiscal year 2020. The financing plan for any significant repair items will need to primarily utilize rate increases of limited duration to recover the anticipated costs.

On July 1, 2016, the BLP implemented a new electric rate structure recommended by Utility Financial Solutions (UFS) following their completion of a comprehensive cost-of-service study. UFS also evaluated our reserve practices to ensure rates were adequate to fully fund an aggressive 5-year capital investment program (CIP) focused for the first time in many years on "non-generation" assets, primarily needed transmission and distribution projects. The Board established a financial strategic objective to "*operate in a manner that ensures long-term financial resources, rate stability, and customer value.*"

Capital funds are not set aside in the Board approved 5-year CIP to pay for substantial repair costs to Sims. Any dollars to be used for this purpose will need to be paid for with rate increases above those set by the UFS established cost of service. In other words, the BLP's current "cost-of-service" used to set its rates does not include funding for any of these improvements. As an example, if the Board wanted to fund 18 million dollars of repair costs over the next three fiscal years (\$6 million per year for planned outages), an approximate 16.4% rate surcharge would need to be applied against all customer classes over this three-year period to fund this amount. Such an increase would again place our average retail revenues per kWh at a level far in excess of other municipal electric utilities in Michigan, negatively impacting the competitiveness of commercial and industrial operations within the Grand Haven community.

Given the high probability further repairs will be required above this assumed \$18 million dollar funding level, the BLP should be prepared to increase rates even higher to pay for currently unknown repairs once they commit to maintaining Sims as an element in its power supply portfolio.

A "payback" on these investments does not exist. Since Sims power plant operating expenses are already above the avoided cost of electricity now available in the wholesale market, there is no margin available to pay back these repair costs.

(5) The substantial risks and costs associated with continued operation of Sims far exceed any benefits, including any “ancillary” ones

In the BLP staff’s February Integrated Resource Planning presentation, several “considerations” were highlighted that need to be evaluated when making longer-term power supply plans. A review of the presentation would highlight that every resource option the BLP may consider will come with its own set of risks, costs, and benefits. Many of the significant costs and risks associated with continued operations of the Sims power plant have already been highlighted herein. There are those in the community that are pointing to other “ancillary” benefits to maintaining operations at Sims. The BLP has considered these benefits and the potential costs to address them, some more comprehensively than others. It is initially apparent, however, the magnitude of such ancillary benefits in total is undoubtedly insufficient to provide the necessary cost justification to make the required repairs in the Sims power plant.

For instance, the plant does provide local employment. Prior to July 1 of this year, 37 employees worked at the Sims power plant. With retirements and attrition at the plant (some as a result of the plant’s announced potential closing) that number is now down to 30 (total employees at the BLP down from 72 to 65). In the course of the next three years there will be an additional 6 employees retiring from the power plant (Production Department). There will also be 13 employees eligible to retire in the Distribution, Metering, and Administrative Departments in the next three years (in total almost 30% of the entire existing BLP workforce is eligible to retire in the next three years). It is anticipated that the Production Department will lose an additional 2-4 employees as a result of transitioning into other areas of the utility. If that happens, it will leave the Production Department with 15 Union Employees and 4 General Employees in three years. Ceasing operations at the Sims power plant will not eliminate the need for all of these production employees (since utility operations of other functions within the utility must continue). There may be a smaller local plant built, however, newer technology plants will undoubtedly require fewer employees than Sims. For the most part, it would appear a transition to this smaller workforce may be achieved with only minimal, if any, layoffs over the proposed transition period. This is another reason the local BLP union is supporting the proposed closure plan and schedule. Not following this schedule actually produces more employee turnover concerns.

The BLP and the Sims power plant provide thermal heat to the City’s downtown snowmelt system under an agreement with the City through December 31, 2020. Under this contract, the City (and downtown snowmelt system users) pays for **fuel related expenses** at Sims power plant to produce the heat needed by the system and for **all costs associated with pumping the heated water to and from the plant**. Other plant capital costs and boiler operations and maintenance costs are not recovered from snowmelt customers under the contract. Follow-on contractual arrangements for heating the snowmelt system need to be determined and a plan implemented to ensure continued operations of this system; however, snowmelt costs and revenues are rather insignificant in comparison to the much greater costs to continue operating the plant to produce power.

Natural gas costs (as compared to coal in **\$/mmbtu**) and greater efficiencies involved in natural gas boilers, as opposed to the coal-fired process at Sims, will present a lower **overall** long-term cost option for heating the City's snowmelt system, when consideration is given to all costs to produce heat – those paid by the City and snowmelt users under the existing agreement with the BLP and those paid by other BLP electric system users for maintaining an outdated less efficient coal-fired boiler to produce the heat for the snowmelt system and to generate electricity.

The installation of new higher efficiency natural gas fired boiler will actually provide an opportunity to lower the **overall** costs of operating a heat source for the snowmelt system, not raise it. As has been discussed herein, Sims is less efficient, more costly, and less reliable than alternative available power supply options; it too is less efficient, more costly, and less reliable as a continued source of snowmelt thermal heat (as compared to other available heat sources).

With lowering expenses associated with the Sims closure, the revenue requirements needed from our customers will decrease. The BLP provides a "payment-in-lieu-of tax" (or PILOT) to the General Fund of the City of Grand Haven that is 5% of gross retail sales of the utility. When the BLP's total charges to its customers go down, the PILOT to the General Fund of the City goes down proportionately. Maintaining higher utility rates for the purpose of generating more utility contributions to the City's General Fund, however, seems counterproductive to the collective welfare of the electric rate and tax payers in the community (that are to an extent one in the same).

Federal annual funding for Army Corp of Engineers harbor dredging is allocated among Great Lakes ports partially based on the lake-vessel commercial traffic using each harbor (as measured in annual collective volume/tonnage carried by these ships). Although Sims power plant coal deliveries do comprise a portion of the Grand Haven harbor annual commercial lake-vessel volume, these shipments have substantially decreased with plant production over recent years and the volume of others currently using the Grand Haven harbor, even with the loss of all Sims volume, is adequate to maintain funding as currently determined.

These ancillary benefits, and others not mentioned, need to be further evaluated, more fully quantified, and adequately addressed as the community moves forward; however, the combined value of ancillary benefits associated with continuing Sims operation are undoubtedly lower in comparison to the known and more direct added costs of the BLP's power supply (as evaluated herein) and risks associated with continuing operations far outweigh any and all potential benefits. Additionally, any delays associated with the closure decision to further consider and more closely evaluate these ancillary benefits, would seem to be unwarranted and counterproductive, particularly given that the plant was quite likely to retire before 2025 regardless. These issues would have needed to be dealt with in the near term, and their associated costs are likely to be lower, addressing them sooner rather than later.

(6) The Sims power plant closure plan is consistent with identified customer sentiment.

The BLP contracted with GreatBlue to conduct independent Customer Satisfaction surveys in each of the last two years. GreatBlue has over 38 years of experience in affording its diverse client base “actionable analytics” to help them identify, address, and improve the way they communicate with their key constituents. Hometown Connections has partnered with GreatBlue to provide more affordable surveys of this nature to public power utilities across the country. GreatBlue’s partnership with Hometown Connections and APPA member utilities allows each to benchmark local results with other communities that have used these services.

Generally, the BLP customer satisfaction ratings in nine organizational characteristics measured in the survey in separate categories for residential and commercial customers were quite high in both 2016 and 2017. In 2017, the BLP received an average positive rating in these nine areas of 86.7% among residential customers and 87.1% among commercial/industrial customers. These annual surveys also provided an opportunity to ask “value” questions of BLP customers.

One issue GreatBlue asked respondents questions on was the value customers placed on maintaining “local generation.” In the most recent 2017 survey, both BLP residential customers (80.6%) and commercial customers (70.0%) said that they felt it was very important or somewhat important to generate some or all of the BLP distributed power locally. When these same respondents were asked if they would pay more for a local source of power, the majority of both the residential customers (67.5%) and commercial customers (68.0%) said “no.” For the minority that said they were willing to pay more, 69.7% of residential customers and 88.5% of commercial customers would not be willing to pay more than 5% more for local generation. In other words, only 13.1% of residential customers and 6% of commercial customers valued local generation enough to pay an additional 5% on their electric bills for the BLP to own and operate such generation.

These surveys also showed substantial local public support for transitioning away from coal to “cleaner” power supply alternatives, particularly if this goal can similarly be accomplished without significantly impacting rates or reliability.

Additionally, BLP staff has been meeting with “key accounts,” those comprising our top ten users, over the last several years to discuss actions being taken by the BLP that may impact their electric service. These top ten electric users comprise approximately 35% of BLP retail sales volume (in kWh). The 25 largest customers comprise nearly 50% of the system’s sales volume. After BLP staff’s recommendations on Sims were presented to the Board in February, two “Business Forums” were scheduled to address the issue with these “key” customers. All of the system’s 25 largest commercial and industrial customers were invited to attend one of these events. Representatives from 14 customers comprising one-third of the BLP’s annual retail sales volume (in kWh) attended one of these forums.

These customers were given some of the same facts contained in this report. Their response was clear, support for continued operations of Sims was very low, particularly if it is determined that the costs of continued operations are higher than available alternatives and that paying such higher costs do not bring added reliability to them as customers. Support was also high at the forums for the BLP “transitioning to a more sustainable, economical, and diversified power supply portfolio.”

(7) Substantial environmental regulatory compliance costs may be avoided by establishing a firm date of closure on June 1, 2020.

Environmental rules and regulations related to coal-fired power plants continue to change and evolve over time. Although there has been a bit of a reprieve in implementing several high visibility environmental regulations impacting coal-fired power plants with the recent change in administration, particularly the Obama administration’s Clean Power Plan to reduce carbon emissions and address climate change, several environmental regulatory requirements are being implemented that will impact the Sims power plant in the near term.

As an example, measures are now being implemented that further restrict the handling and disposal of Coal Combustion Residuals (CCR), more commonly known as coal ash. The revised rules require the construction of new containment structures to replace active “ash ponds” on the Sims site by October, 2018. The BLP has engaged engineers to design new compliant ash facilities for Sims and this work will soon be bid out for construction if a closure date is not set. According to the new CCR regulations, should the owner certify it will cease operations of the power plant and agrees to appropriately close any ash ponds on site by a date certain, the existing active ash ponds not meeting the new rule may, if approved, be utilized in the interim until that closure date. Announcing a firm future closure date within the confines of existing environmental rules may have the effect of reducing compliance costs over the remaining life of the facility. The potential savings associated with the CCR rule alone exceeds an estimated \$500,000 in these regards. Other environmental compliance concerns could additionally be resolved in this fashion.

(8) The BLP can and will continue to meet the community’s expectations for quality local electric service that returns value to its customers and the community as a whole without operating the Sims power plant beyond June 1, 2020

The BLP established mission is to meet the community’s expectations for quality local electric utility service that returns value to our customers and the community as a whole. To meet this mission the BLP is committed to determine where it can best bring value and where customer value is best achieved by working in cooperation and partnership with others.

Some have recently questioned, if the BLP no longer generates most of the power it sells, how can it bring any value – why not just sell the utility? Many studies (looking at municipalities getting into the electric utility business and those contemplating a potential sale) have determined the greatest value produced by smaller municipally owned electric utilities stems primarily from their distribution system operations, administrative procedures, and not-for-

profit financial opportunities along with their ability to “aggregate” customer loads to collectively access a portfolio of generation and purchase options Not typically by generating the majority of electricity they sell.

While there may be added value to be provided by new local generation options in this portfolio approach, the BLP’s “joint action” agency, the Michigan Public Power Agency (MPPA), and potentially other partners, can no doubt provide further value (above the potential of the BLP acting alone) in the areas of generation and transmission, particularly baseload supply options which require scale to produce the lowest cost.

As a further example, the BLP has for many years maintained all of its billing and accounting records on internally owned and operated computers and servers using rather expensive (and now obsolete) licensed software. The BLP recently, with the assistance of a third party expert, completed a comprehensive review of its replacement alternatives in this area. For a host of reasons, the BLP is now implementing its selected Customer Information System (or CIS) alternative that utilizes “cloud based” off-site software and data storage. This same process is being used to resolve business and personal computing problems in a variety of applications throughout our society. The decision revolves around determining where your organization can add value to your customers and where your customers are better served by you partnering with others in a particular application and refocusing your internal resources to areas where you can better bring value.

The BLP has a history of generating power for the Grand Haven community and has brought “value” to its customers in doing so (as our mission would suggest). The proposed plan to close the Sims power plant affords the community a strategic opportunity to reevaluate the BLP’s “value proposition” to its customers and the community as a whole and more fully assess the best use of its resources to fulfill its stated mission. This reassessment will likely involve some form of local generation, but its significance in its greater power supply portfolio will no doubt be less. The BLP has already been reducing its dependence on the Sims power plant for some time. Most similarly sized municipally-owned utilities made this transition years ago.

As the introduction in the BLP’s strategic plan suggests:

“As the BLP has adapted and changed in the past to meet our customers growing energy needs, this Plan provides a course forward, identifies progressive actions, and sets future objectives that will allow us to continue to meet our mission to the community.”

The BLP’s recommendation to “begin planning” for a June 1, 2020 closure of the Sims power plant is another step in achieving its mission and established strategic objective to transition to a more sustainable, economical, and diversified power supply portfolio. Approving the recommendation and choosing to move forward under this proposed timeline only takes the Sims power plant out of the BLP future portfolio. Further discussions are required and significant decisions will be made by the BLP to implement other staff recommendations presented to the Board at their February meeting. These other recommendations are included here:

- (1) Revisit and revise as necessary, the Sims operating schedule and dispatch provisions to “optimize” economically the remaining life of plant (through June 1, 2020)
- (2) Complete construction of necessary 69 kV improvements and obtain Network Integration Transmission Service (NITS)
- (3) Continue to work with MPPA to evaluate potential jointly owned projects and Power Purchase Agreements (PPAs) to fill void created by these closures (The Sims power plant and the Grand Haven Diesel Plant)
- (4) Review and revise as necessary the BLP Energy Risk Management Plan and Hedge Plan used to facilitate future power transactions and energy trading activities
- (5) Continue efforts to evaluate a local replacement of at least some of the lost generation capacity from the Sims power plant and the diesel plant – at this time the most effective alternative for this purpose appears to be a facility utilizing the newest technology natural gas-fired Reciprocating Internal Combustion Engines (RICE units) with a combined capacity of approximately 30 MW
- (6) Throughout, the goal is to provide for a more sustainable, economical, and diversified power supply portfolio