

Saskatoon Light & Power

2017 Annual Report



City of
Saskatoon

Transportation & Utilities Department

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1.0 EXECUTIVE SUMMARY

Saskatoon Light & Power is proud to serve its customers with an electrical distribution system that meets or exceeds national averages for reliability. Customer feedback obtained through the Civic Services Survey indicated that satisfaction levels regarding electrical distribution reliability remained high over the past five years and is one of the top three key strengths of the City of Saskatoon (City) (high importance and high satisfaction).

The most important performance indicator for the utility is its ability to work safely. Staff worked in excess of 246,000 hours in 2017 and recorded two lost time injuries. Their dedication to working safely and making continuous improvements to our safety program is recognized and appreciated.

The utility continues to provide a very high financial return to the City offsetting the reliance on property taxes. The total net financial benefit increased by over \$2.53 million in 2017 to \$46.69 million. The provision to capital reserves for the utility increased by \$569,400 to \$13.51 million. Increased attention will need to be spent in future years on capital spending to ensure the system is maintained at an acceptable level to ensure continued success.

Saskatoon Light & Power implemented the first two phases of a Smart Grid Control system in 2017. The new system integrated data from the Geographic Information System (GIS) and Advanced Metering Infrastructure (AMI) system to provide more functionality. Bringing this information together will allow the utility to better monitor conditions on the system. Future phases for this system include the implementation of an Outage Management System that will provide enhanced communication opportunities to our customers by displaying maps of outages on our website.

Saskatoon Light & Power was recognized by the Canadian Electricity Association (CEA) and awarded the 2017 Leadership in External Collaboration and Partnership award. The award recognized the utility's commitment to external collaboration and partnerships with Indigenous Peoples, local communities and other stakeholders.

Saskatoon Light & Power also continued to demonstrate a commitment to environmental stewardship by implementing new procedures for handling sulfur hexafluoride (SF₆) gas that is used in some electrical components to prevent this potent greenhouse gas from escaping into the environment. The utility also continued its program to replace transformers containing polychlorinated biphenyl (PCB) and by expanding the use of light emitting diode (LED) street lights.

Challenges exist for the utility in the future, but strategic plans are being made to address those concerns.



2.0 OVERVIEW – SASKATOON LIGHT & POWER

Saskatoon Light & Power is a municipally owned electrical utility that provides a number of services to the citizens of Saskatoon, including:

- Generation of electricity from environmentally responsible sources;
- Purchase of bulk electricity from SaskPower;
- Distribution of electricity to customers;
- Provision of fibre-optic communication connectivity for other divisions; and
- Provision of street lighting services.

2.1 Mission Statement

Saskatoon Light & Power's mandate is to provide safe, reliable, and cost effective electricity in an environmentally responsible way. We strive to minimize the number and duration of customer outages with a focus on system maintenance, staff training and safety.

2.2 Our Values

Trust

Our customers trust that we will provide them with reliable service and respond as quickly as possible to any service interruption. We earn that trust by carefully planning our work and undertaking renewal projects when needed.



Integrity

We are accountable for our actions. We publish reliability statistics and compare against other Canadian utilities when available. We respond to customer inquiries quickly and work to resolve issues.

Respect

We respect our customer's privacy by following established legislation. We work together as a multi-disciplinary team to provide a wide array of services. We rely on the technical expertise of our staff to operate a complex utility. We put safety first in everything we do, keeping in mind that our staff have families and friends that rely on them.

Honesty

We admit our mistakes and take necessary steps to prevent similar issues. We are open and honest with our customers, City Council, and the media. We listen to our customers.

Courage

Although we are a relatively small electrical utility, we take on big, complex and innovative projects. We invest our time and resources on smart projects and strive to continuously improve our services.

2.3 Our Leadership Commitments

Reliable and Responsive Service

Through the use of sound long-range planning principles, services are designed to meet future needs. Through the application of asset management principles, existing assets are maintained to meet reliability requirements. Through emergency preparedness planning, we will be ready to respond to issues when they arise.

Strong Management and Fiscal Responsibility

Saskatoon Light & Power's strategic plan aligns with the City of Saskatoon's (City) corporate strategies. Key performance indicators are measured and tracked to achieve goals that are meaningful.



Effective Communication, Openness and Accountability

We prepare annual reports and make them available to our customers, City Council, and our staff. We communicate with staff regularly to build and strengthen relationships and provide key information in a timely manner.

Innovation and Creativity

We work on major initiatives using a collaborative approach, often using joint committees to resolve staffing-related issues. We focus on productivity while maintaining high quality standards and never compromising safety.

2.4 Our Strategic Goals

The work of Saskatoon Light & Power aligns with the following corporate strategic goals and strategies for the long term (10 years):

Continuous Improvement

- Provide a coordinated approach to customer service with quick and accurate responses.
- Make health and safety a top priority in all that we do.
- Provide ongoing skills training and professional development opportunities for staff.
- Increase productivity by being more efficient in the way we do business.

- Leverage technology and emerging trends to reach our goals, serve citizens and connect meaningfully with our stakeholders.

Asset and Financial Sustainability

- Increase revenue sources and reduce reliance on residential property taxes.
- Reduce the gap in the funding required to rehabilitate and maintain our infrastructure.
- Adopt and implement a corporate-wide asset management and rehabilitation philosophy.

Environmental Leadership

- Create new sources of green energy where feasible.
- Reduce greenhouse gas (GHG) emissions tied to City operations.

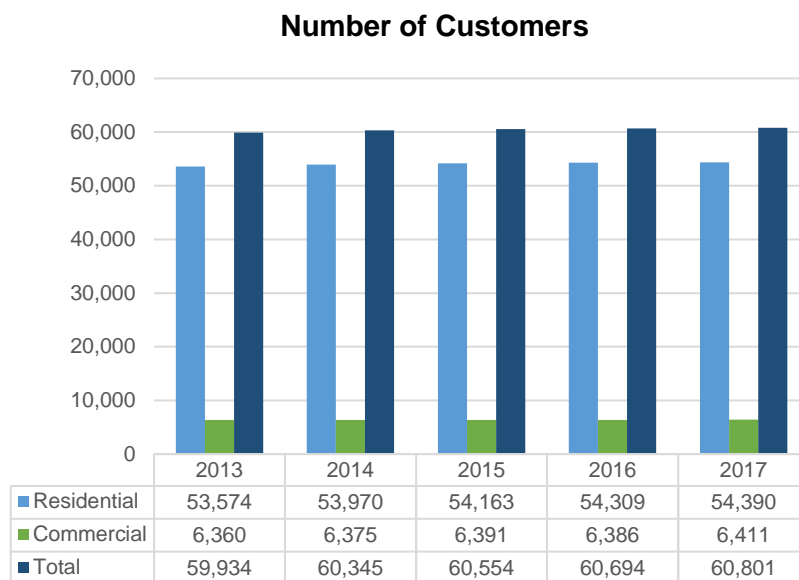
Economic Diversity and Prosperity

- Plan and invest in infrastructure needed to attract and support new businesses and skilled workers to the city.

3.0 OUR CUSTOMERS

3.1 Number of Customers

The number of customers served by Saskatoon Light & Power has grown over the past five years (1.4%), primarily due to infill development within established neighbourhoods.



The average number of customers served in 2017 was 60,801, consisting of 54,390 residential customers (89.5%) and 6,411 commercial customers (10.5%).

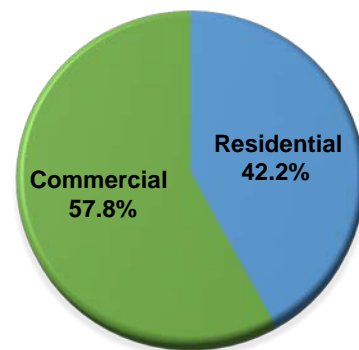
Since the utility's franchise boundaries are fixed, the majority of Saskatoon Light & Power's anticipated growth in the future will come from increased densification of the downtown core and existing neighbourhoods.

3.2 Revenue by Customer Type

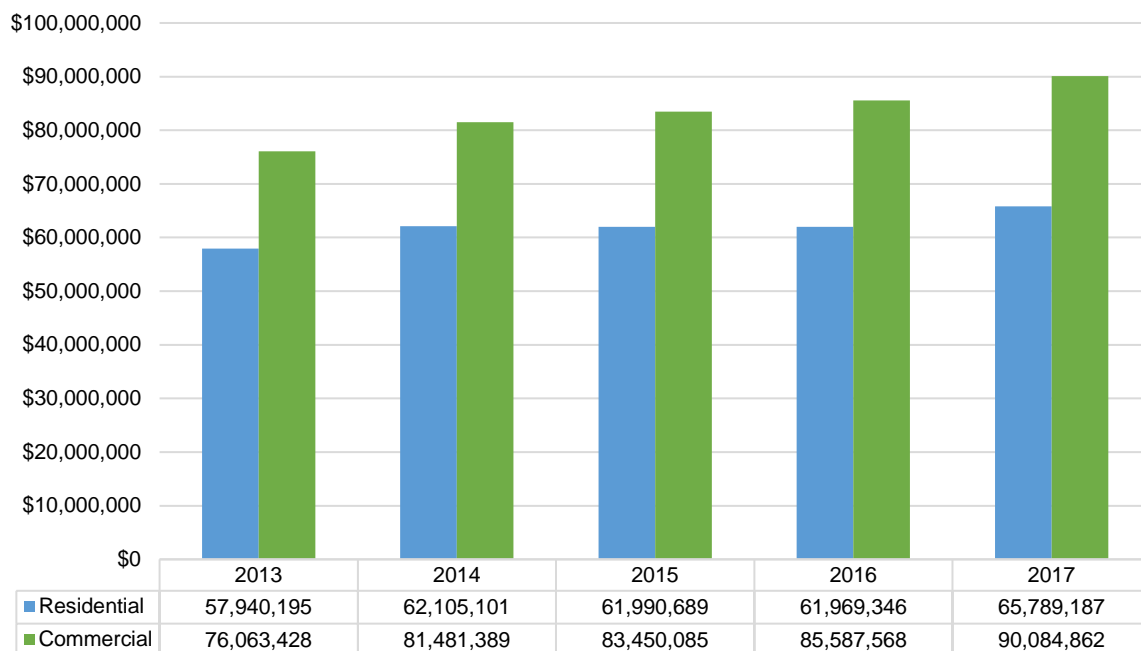
Although the number of commercial customers is much lower than the number of residential customers, consumption by commercial customers is much higher; therefore, accounts for a higher percentage of the utility's revenues.

The total amount of revenue collected from residential customers in 2017 was \$65,789,187 (42.2%). Revenue collected from commercial customers totalled \$90,084,862 (57.8%).

Revenue by Customer Type



Revenue by Customer Type

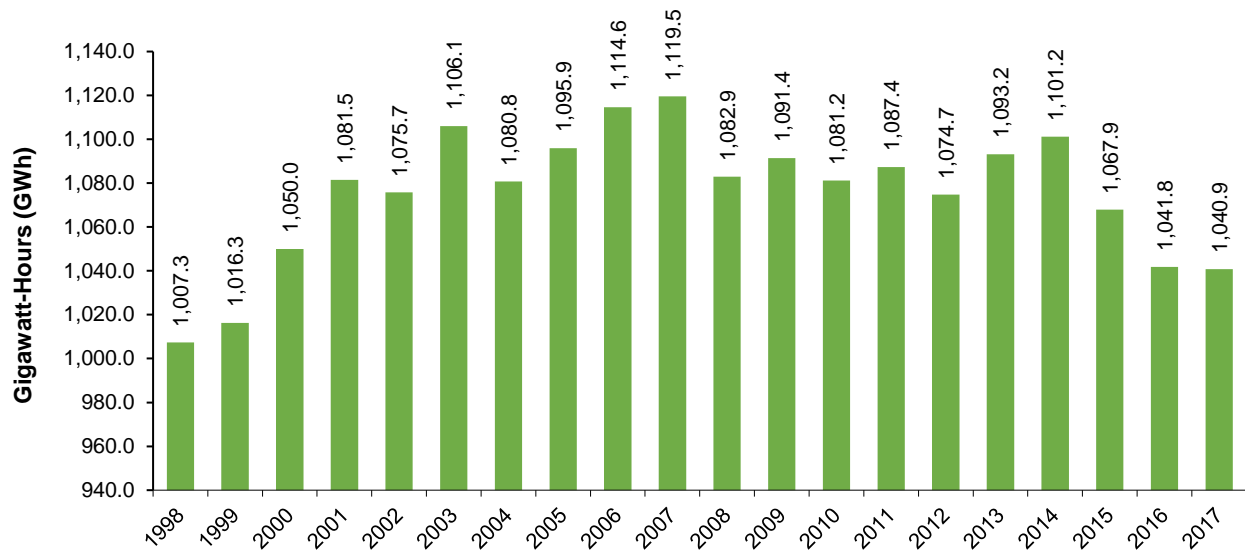


Revenue has continued to grow over the past five years primarily due to rate increases implemented by SaskPower and matched by Saskatoon Light & Power.

3.3 Energy Consumption and Demand

The following chart shows the 20 year history for total energy sales to all types of customers. Energy consumption has not increased over the past decade even though the number of customers have increased. Total sales has decreased by 7% since the peak in 2007. Conservation may account for this decrease. Annual fluctuations can also be created by seasonal weather patterns.

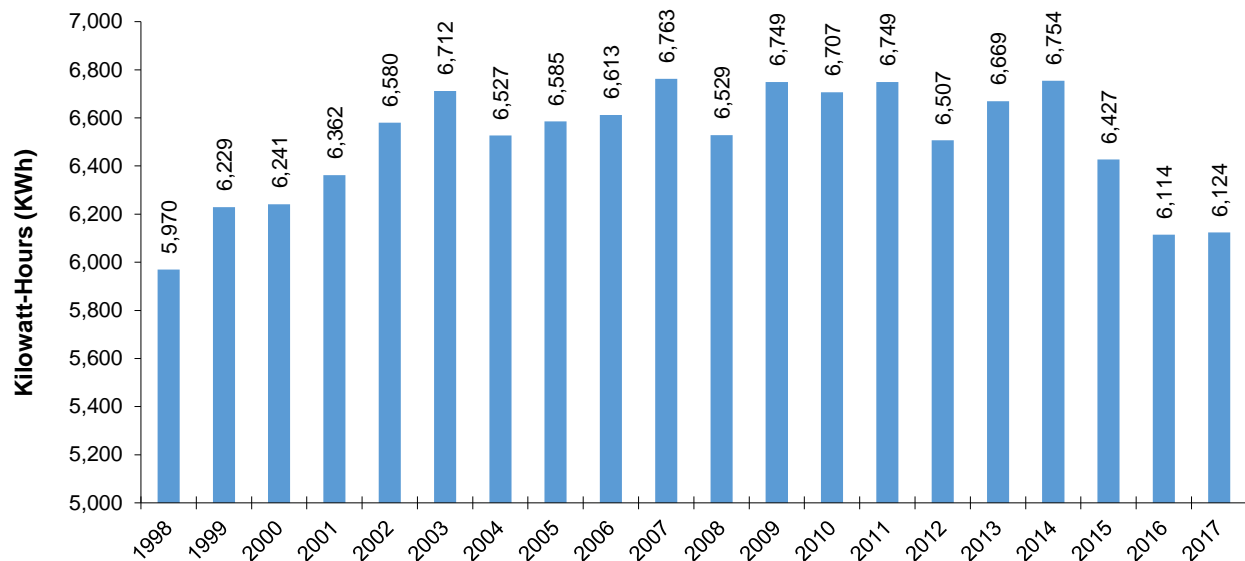
Total Electrical Energy Sales



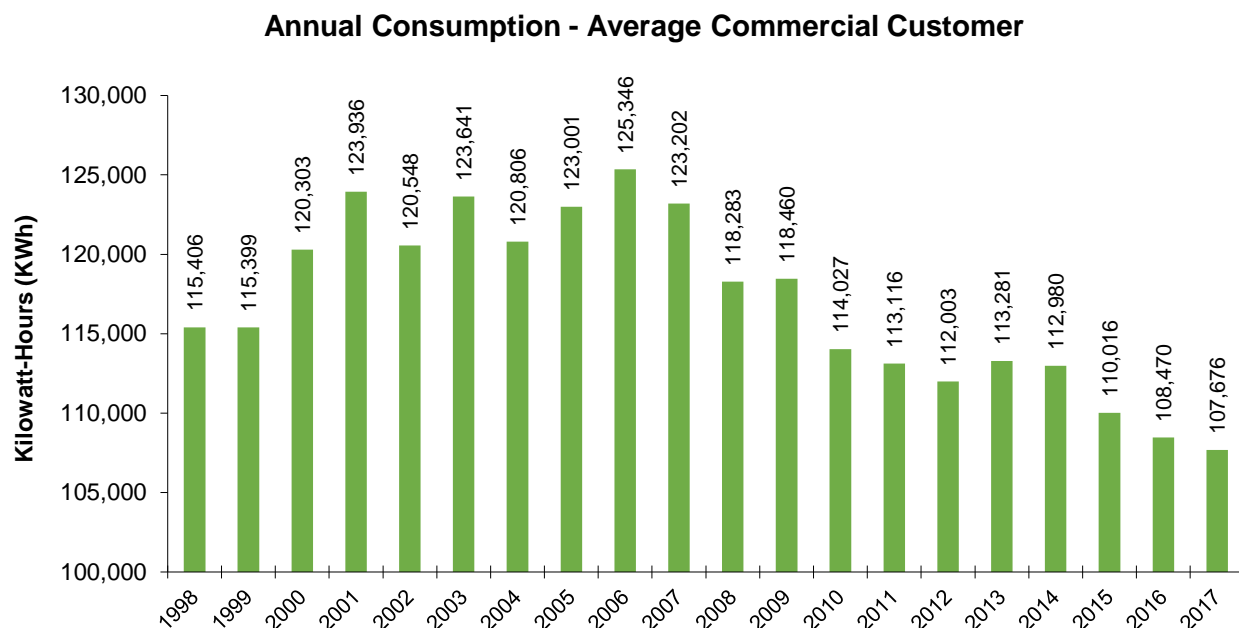
The next two charts show the amount of energy consumed by the average residential and commercial customer.

Annual consumption for residential customers remained relatively flat between 2003 and 2014, but has decreased by over 9% since 2014.

Annual Consumption - Average Residential Customer



Annual consumption for commercial customers has decreased steadily since 2006 by a total of 14%.

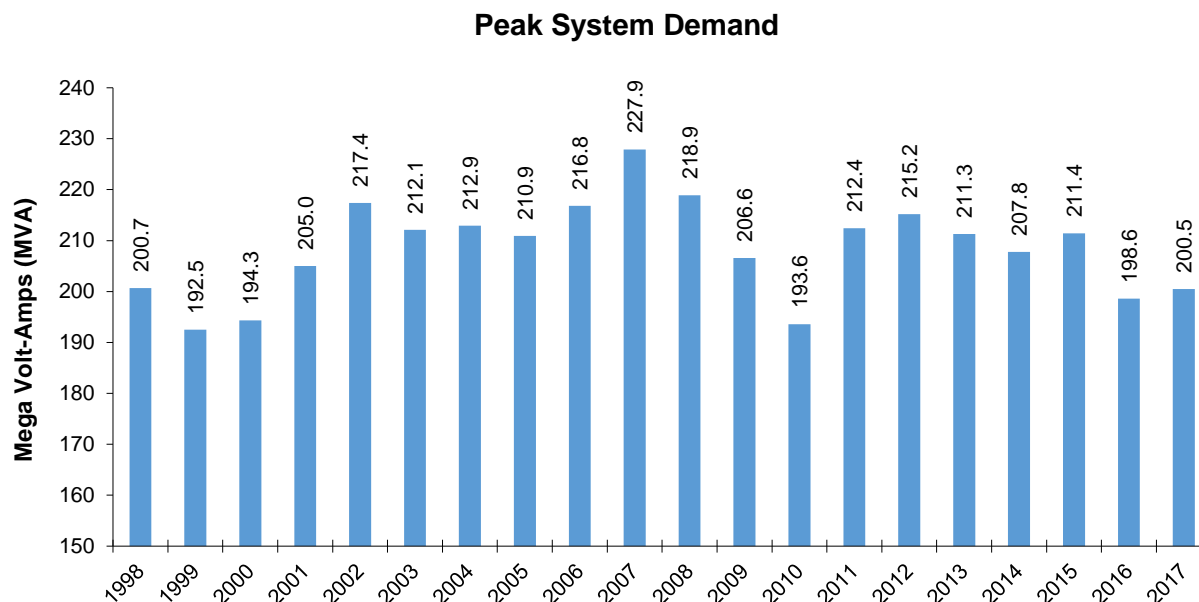


The next chart shows the peak system demand for the past 20 years. SaskPower charges Saskatoon Light & Power for bulk power based on three criteria:

- Electrical Energy (GWh)
- Demand Charge (MVA)
- Monthly Service Charge

The demand charge is intended to relate to costs associated with transmitting the electricity from the generating stations to the service area. If Saskatoon Light & Power's customers use power at the same point in time, the transmission system needs to be sized accordingly to handle that quantity of electricity and SaskPower, therefore, charges more. The peak system demand indicates the highest level observed during the year. This typically occurs on one of the hottest days in the summer.

This chart shows that there has been a 17.7% fluctuation in peak system demand between the high experienced in 2007 and one of the recent lows experienced three years later in 2010. This fluctuation can lead to annual bulk power cost variances from budget.



3.4 System Reliability

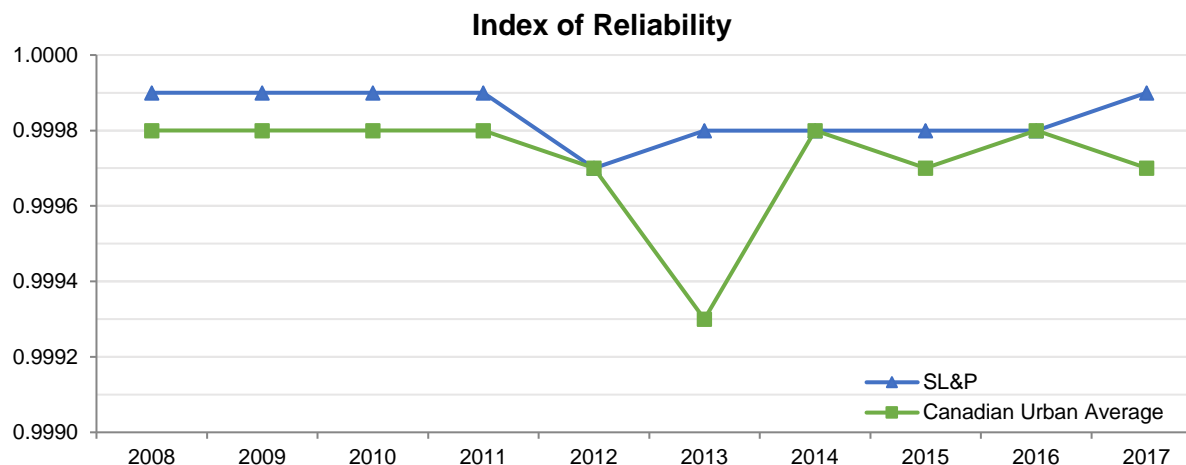
Saskatoon Light & Power is a member of the Canadian Electricity Association (CEA). The CEA collects reliability statistics on behalf of its member companies and reports the averages for comparative purposes.

The CEA reports on urban utility statistics separate from rural utilities in order to provide a better basis for comparison. Urban utilities generally have better reliability.

Saskatoon Light & Power has set a goal of meeting or exceeding the system reliability performance based on the Canadian Urban Average.

Index of Reliability

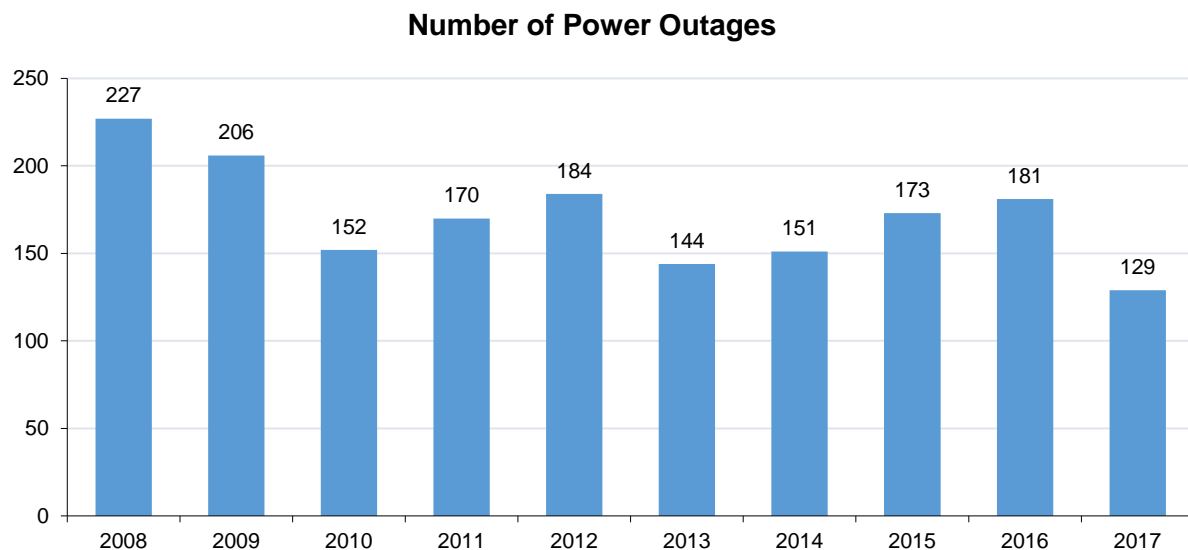
The following chart shows the Index of Reliability (IOR) for Saskatoon Light & Power in comparison to the Canadian Urban Average. This index measures the availability of service to customers on an annual basis. For example, an IOR of 0.9998 would mean that electrical service is provided 99.98% of the time over a one year period.



This chart shows that Saskatoon Light & Power has been consistently meeting its goals and performing as well as, or better than, the Canadian Urban Average. This is a key metric for utilities since both the number of outages as well as the duration have an effect on the IOR.

Number of Power Outages

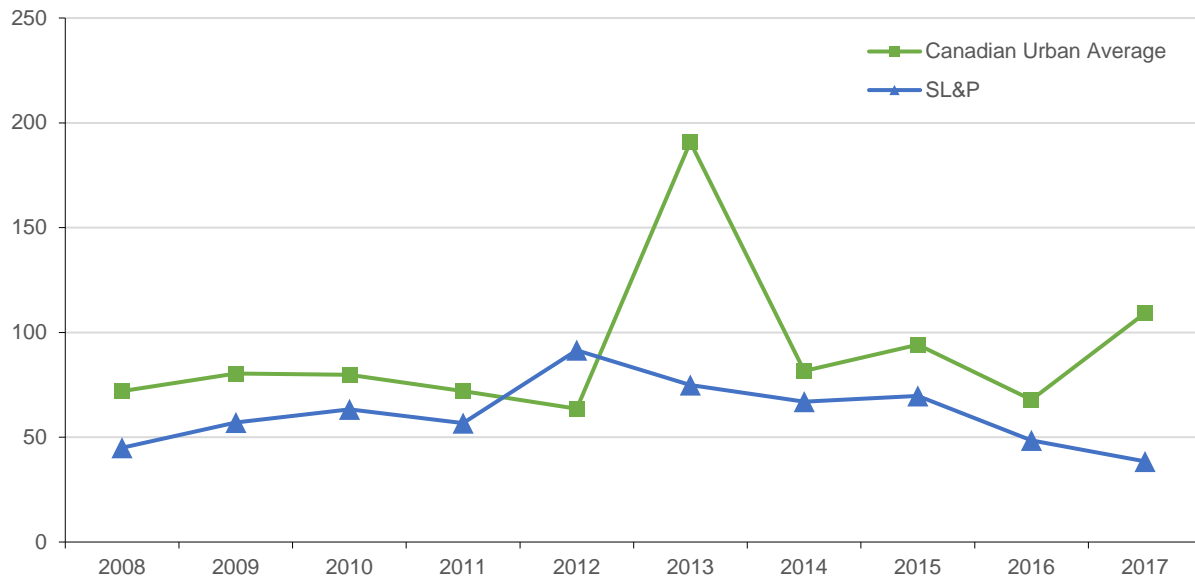
Saskatoon Light & Power also tracks the number of outages that are experienced annually and compares against its own performance from previous years. The following chart shows that the number of outages has remained relatively consistent but was at a 10-year low in 2017.



Duration of Power Outages

The following chart shows the average time for restoring power to customers who experienced an outage during the year. The 10-year average for Saskatoon Light & Power was 61 minutes. The Canadian Urban Average was 91 minutes. Saskatoon Light & Power performed better than the Canadian Urban Average in every year except 2012.

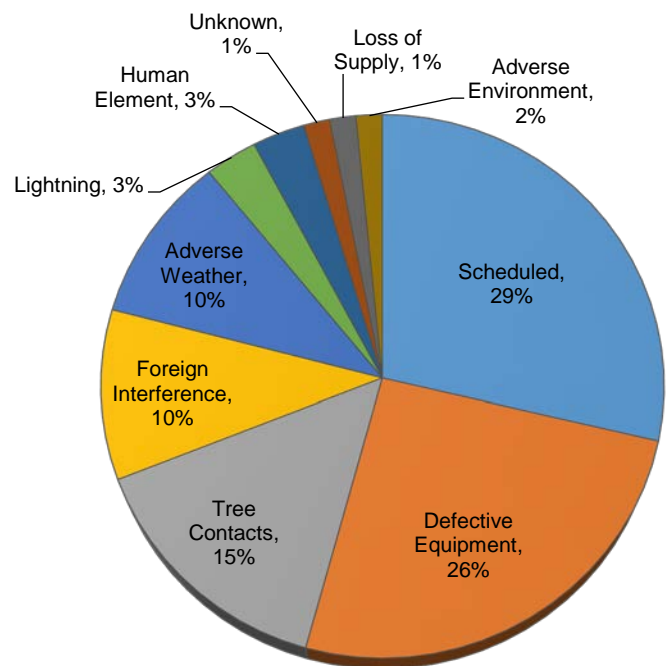
Customer Duration of Outages



Cause of Power Outages

The four primary causes of power outages in 2017 were:

- 1) Scheduled outages for maintenance work (29%);
- 2) Defective equipment (26%);
- 3) Trees contacting overhead power lines (15%);
- 4) Interference by a third party (such as damage from a vehicle collision, bird contacts with overhead power lines, contractor dig-ins with underground cables, etc.) (10%).

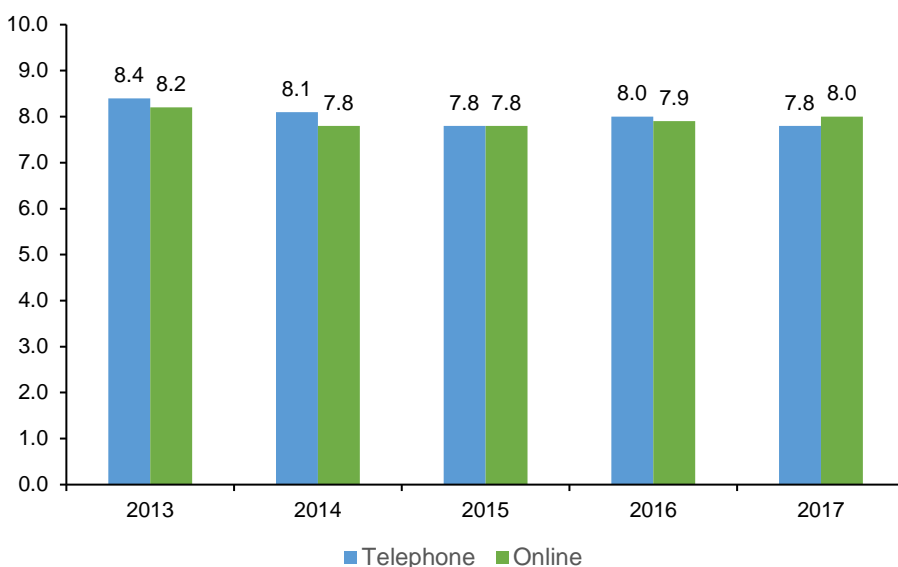


3.5 Customer Satisfaction

"Saskatoon Light & Power is committed to timely, friendly and professional service. Our customers are treated in a fair and equitable manner."

The City conducts an annual Civic Services Survey. One of the questions asks customers to rate the reliability of their electricity provider. Satisfaction levels have remained high over the past five years and was the second highest among all civic services surveyed.

Customer Satisfaction - Reliability

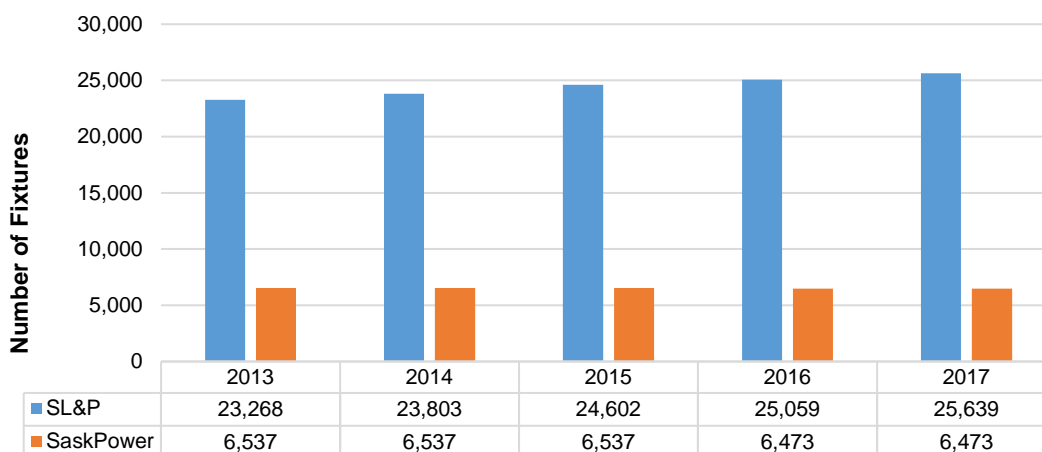


Based on the importance of the service (taken from the 2014 survey) and satisfaction (from 2017), electrical service reliability provided by Saskatoon Light & Power ranks as the third highest key strength among civic services (high importance and high satisfaction).

3.6 Street Lighting

Saskatoon Light & Power maintains 80% of the 32,112 lighting fixtures in Saskatoon and SaskPower maintains the remaining 20%.

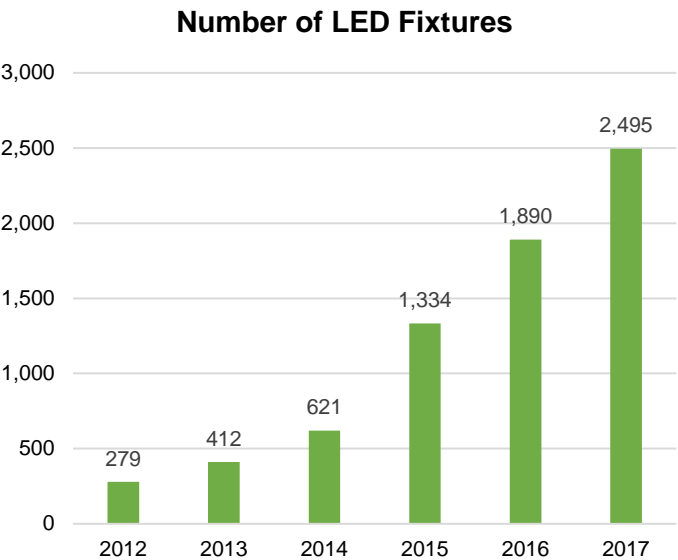
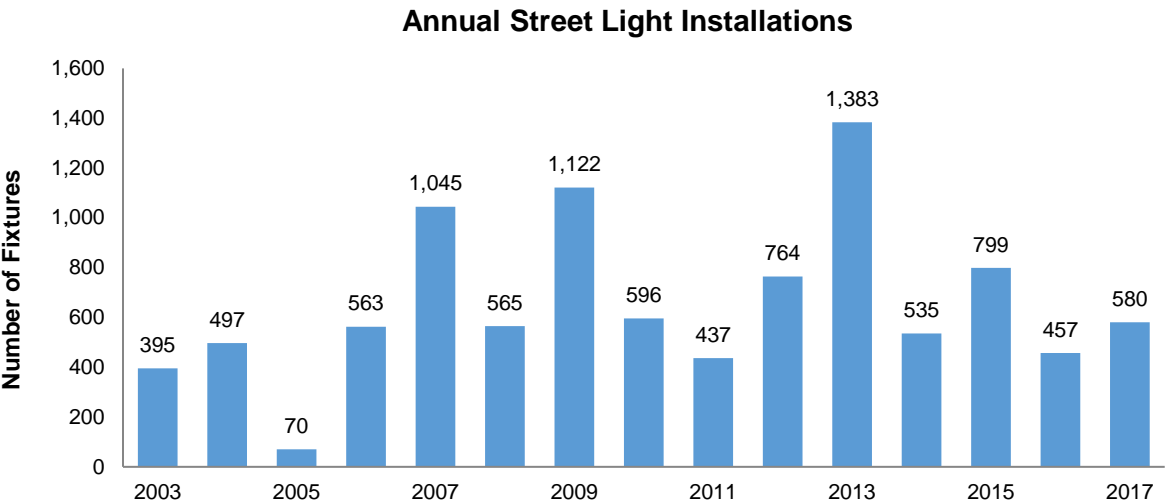
Street Lighting Fixtures



Responsibility for street lighting does not follow electrical franchise boundaries. In 2004, City Council directed Saskatoon Light & Power to take responsibility for all new street lighting projects in the city. Prior to 2004, SaskPower had been installing the street lights in new growth areas outside of our franchise area.

The increase in land development activity over the past decade has been significant and has increased the number of lights installed annually. Typically, 500 to 600 lights are installed each year in residential and industrial areas and additional lights are installed when major roadway projects are undertaken.

The ten-year average for installations is 724 lights per year.



Saskatoon Light & Power has also been leading the way with the implementation of Light Emitting Diode (LED) lighting. LED lights use significantly less energy to produce the same amount of light. City Council approved a recommendation in 2014 to make LED lights the standard for all new installations.

By the end of 2017, a total of 2,495 LED lights had been installed comprising 9.7% of all lights owned by Saskatoon Light & Power.



3.7 Seasonal Decorations and Banners

Saskatoon Light & Power provides 506 seasonal decorations including both illuminated and non-illuminated displays as well as seasonal banners. These decorations are installed in the downtown core as well as along Central Avenue, 33rd Street West, 8th Street East, and on 22nd Street West.

A total of 422 banners were also installed in various business districts throughout the year as part of the City's Banner Program. Installing banners helps to promote local events and provide a sense of arrival into the area.

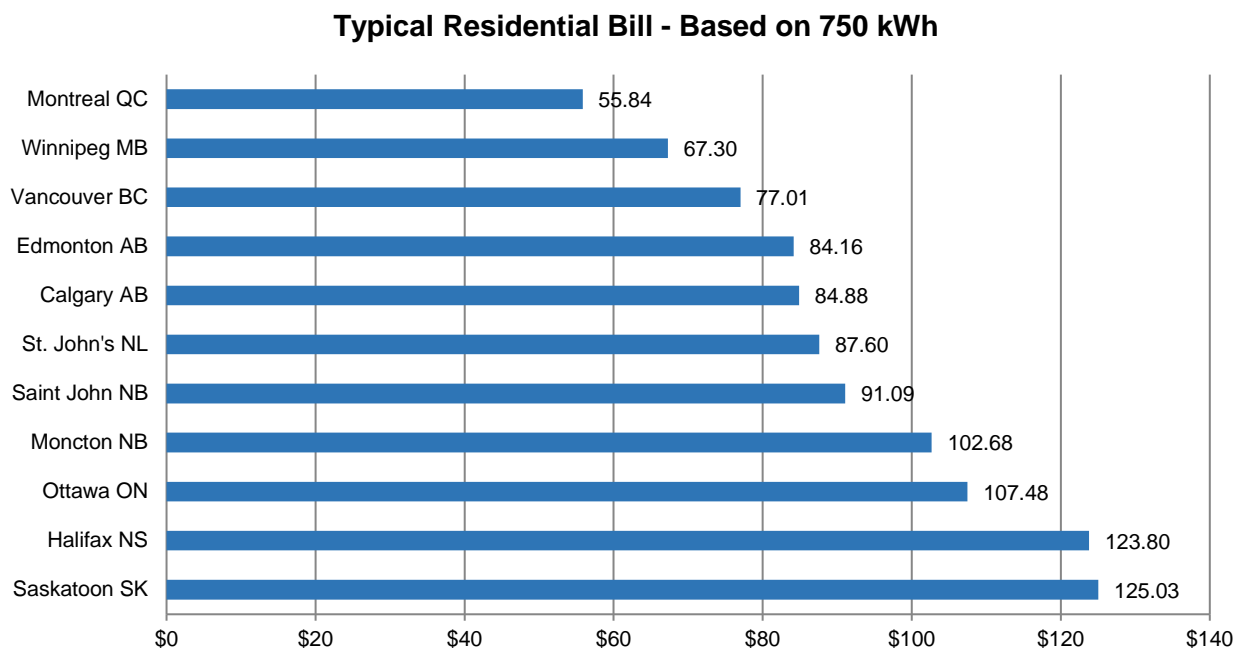
4.0 OUR FINANCES

4.1 Competitive Rates

Saskatoon Light & Power rates for electricity are regulated by City Council through bylaw and have generally been set the same as SaskPower rates for similar customer classes.

The province has established the Saskatchewan Rate Review Panel which reviews applications made by the crown utilities and receives feedback from customers prior to making their recommendation to the province.

The following chart provides a comparison of electricity rates in provinces across the country. Rates in Saskatchewan are relatively high, due in large part to a lack of hydropower resources in the province. Provinces with an abundance of hydropower (including British Columbia, Manitoba and Quebec) tend to have lower energy costs.



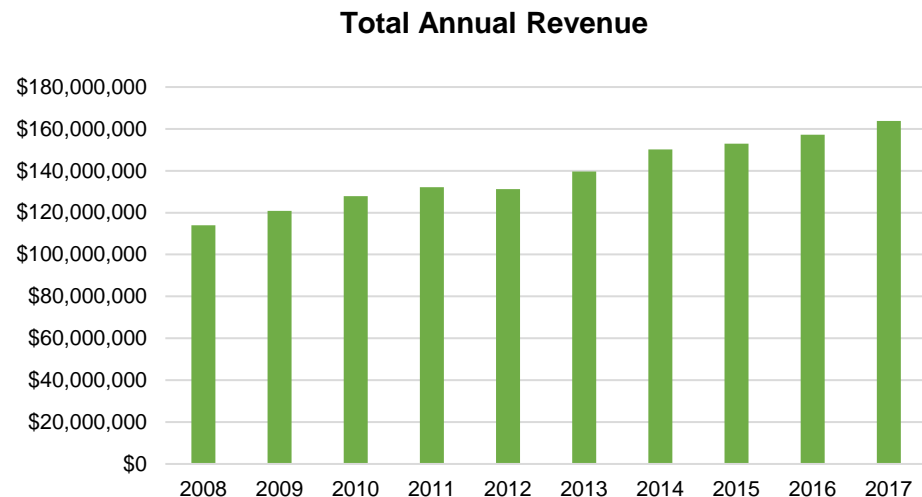
Source - Manitoba Hydro May 2017 Electricity Bill Survey. Rates do not include municipal surcharges.

4.2 Summary of Revenues

Over the past 10 years, total annual revenues have increased from \$114.0 million in 2008 to \$163.9 million in 2017. The average annual increase in revenue has been 4.12%, which accounts for both rate increases over time as well as any increases or decreases in sales quantities. The total overall increase over the past 10 years was 43.8%.

During the same time period, overall consumption by Saskatoon Light & Power's customers decreased by 3.9%.

Therefore, the increase in total annual revenues can be primarily attributed to rate increases to customers.



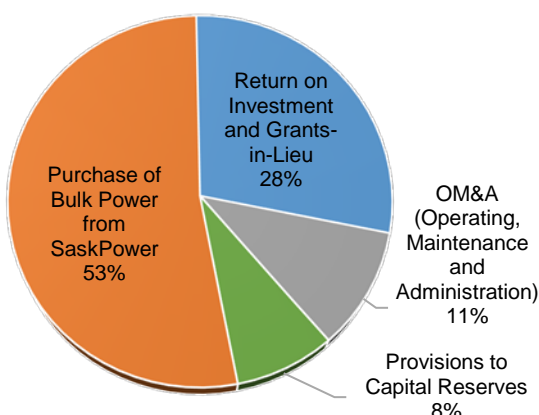
4.3 Summary of Expenses

Saskatoon Light & Power's expenses can be summarized into four main categories.

The largest cost to the utility was the cost of purchasing bulk power from SaskPower. In 2017, bulk power totalled \$86.44 million, which represented 53% of total expenses.

The second largest category was the combination of the Return on Investment (ROI) (\$24.66 million) and Grants-in-Lieu (GIL) of taxes (\$22.03 million) provided to the City. Together, these two items provided a net benefit of \$46.69 million and represented 28% of the utility's expenses.

Summary of Expenses



The third largest cost was the Operating, Maintenance and Administration expenses (OM&A). These items totalled \$17.23 million and represented 11% of the utility's total expenses. Included in this category was a cross-charge to Corporate Revenue to provide meter reading and billing services.

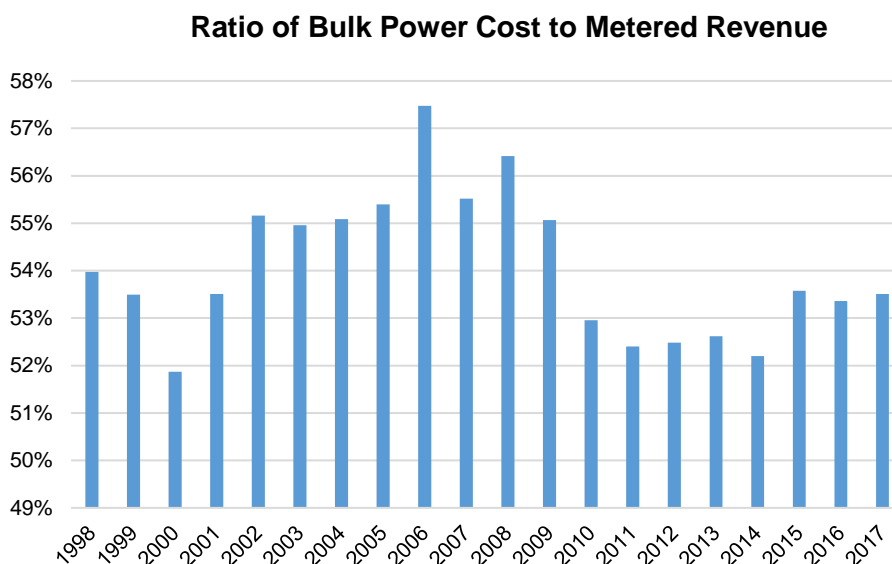
The final category was the provision to capital reserves. In 2017, \$13.51 million was allocated to the utility's reserves to pay for both renewal and expansion of the distribution system (8% of expenses).

4.4 Ratio of Bulk Power Cost to Metered Revenue

Saskatoon Light & Power monitors the ratio of bulk power costs as compared against total metered revenue. Both of these rates are effectively set by SaskPower since City Council in the past has given direction to Saskatoon Light & Power to match SaskPower's retail rates.

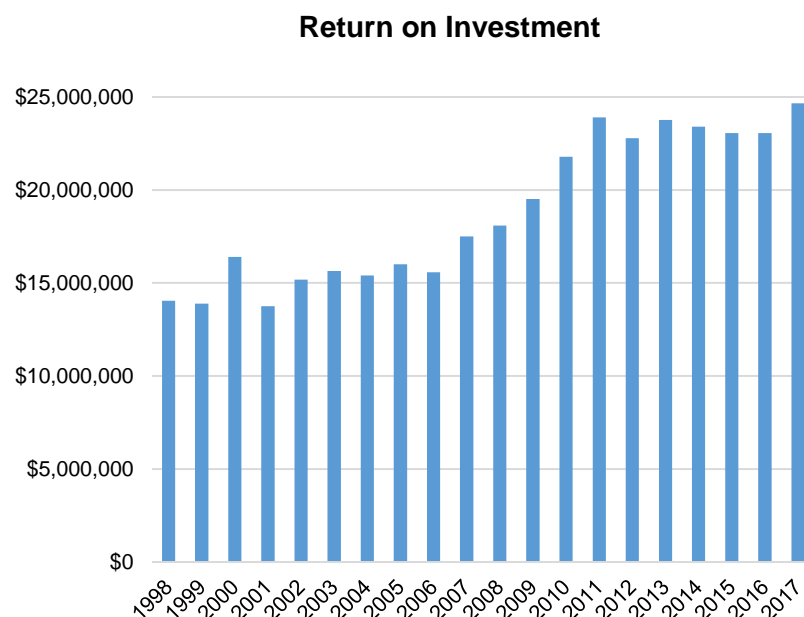
When the increase to the bulk power cost exceeds the increase in retail rates, it is difficult for the utility to deal with inflationary cost increases for both operating and capital expenses.

An increase in this ratio of 1% would have a \$1.6 million negative impact on Saskatoon Light & Power's finances.



4.5 Financial Return to the City of Saskatoon

Saskatoon Light & Power provides a significant financial benefit to the City by providing both an ROI as well as a GIL of taxes. These funds are made available from the utility for the City to use for general operations. This is an important source of revenue for the City, which reduces the pressure on property taxes.



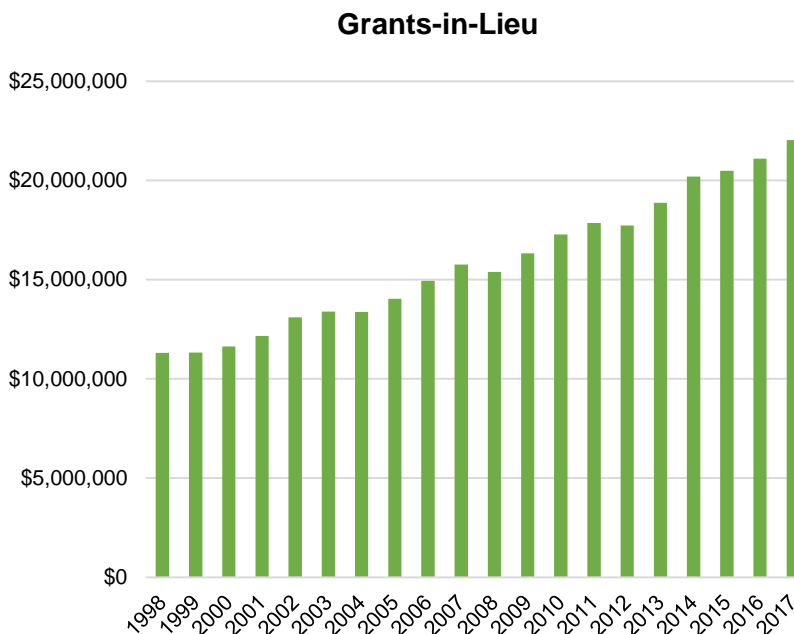
Significant increases were made to the ROI between 2006 and 2011. The ROI increased from \$15,581,531 to \$23,907,400 during that time (an increase of 53%).

The utility has been able to sustain the ROI between 2011 and 2017 with minor annual fluctuations. In 2017, the ROI was \$24,659,700. ROI now represents 15.0% of the utility's total gross revenue, which is very high within the industry.

Saskatoon Light & Power also provides GIL. This amount is formula driven each year based on total revenues. As electricity rates increase, or sales volumes increase or decrease, GIL is adjusted accordingly.

Over the past 10 years, GIL increased from \$15,391,109 in 2008 to \$22,034,664 in 2017 (an increase of 43%).

Combining ROI and GIL, the total net financial benefit from Saskatoon Light & Power to the City in 2017 was \$46,694,364.



23% ↑

Without these stable sources of income, the City would need to find revenue from other sources to meet its requirements. If property taxes were increased to cover these amounts, taxes would need to increase by 23.0%.

4.6 Year-End Operating Budget Variance

Saskatoon Light & Power had a positive variance at the end of 2017 of \$1,473,700 (0.9% of total revenue).

Sales volumes were well below budget as a result of a milder than average winter in the first three months of 2017 and a slightly milder summer, resulting in fewer heating and cooling days. Conservation among commercial customers also had a direct influence on lower sales volumes. An anticipated 5% rate increase announced by SaskPower was included in the budget but was ultimately reduced to 3.5% by the Saskatchewan Rate Review Panel. The result of these factors was decreased budgeted revenue (\$5,103,500).

Bulk power costs were below budget (\$3,523,900) as a result of the decreased sales volume and lower than anticipated rate increase. Administration and general expenses were below budget by \$854,600.

2017 Operating Budget Variance (\$000)

	Budget	Actual	Variance	%
Revenue				
Metered Revenue	\$152,525.9	\$147,213.5	(\$5,312.4)	-3.48%
Municipal Surcharge	15,125.5	14,685.9	(439.6)	-2.91%
Unbilled Revenue	0.0	564.5	564.5	
Other Revenue	1,320.0	1,404.0	84.0	6.36%
Total Revenue	<u>\$168,971.4</u>	<u>\$163,867.9</u>	<u>(\$5,103.5)</u>	<u>-3.02%</u>
Expenses				
Bulk Power	\$89,962.4	\$86,438.5	(\$3,523.9)	-3.92%
Grants-in-Lieu of Taxes	22,694.3	22,034.7	(659.6)	-2.91%
				-
Distribution	8,861.1	7,665.8	(1,195.3)	13.49%
				-
Street Lighting Maintenance	1,808.5	1,464.7	(343.8)	19.01%
				-
Admin & General	7,475.9	6,621.3	(854.6)	11.43%
Provision to EDRR	7,694.0	7,694.0	0.0	0.00%
Provision to EDER	5,815.5	5,815.5	0.0	0.00%
Total Expense	<u>\$144,311.7</u>	<u>\$137,734.5</u>	<u>(\$6,577.2)</u>	<u>-4.56%</u>
Revenue Less Expense	<u>\$24,659.7</u>	<u>\$26,133.4</u>	<u>\$1,473.7</u>	<u>5.98%</u>
(To)/From Stabilization Reserve	\$0.0	(\$1,473.7)		
Return on Investment	<u>\$24,659.7</u>	<u>\$24,659.7</u>	<u>\$0.0</u>	<u>0.00%</u>

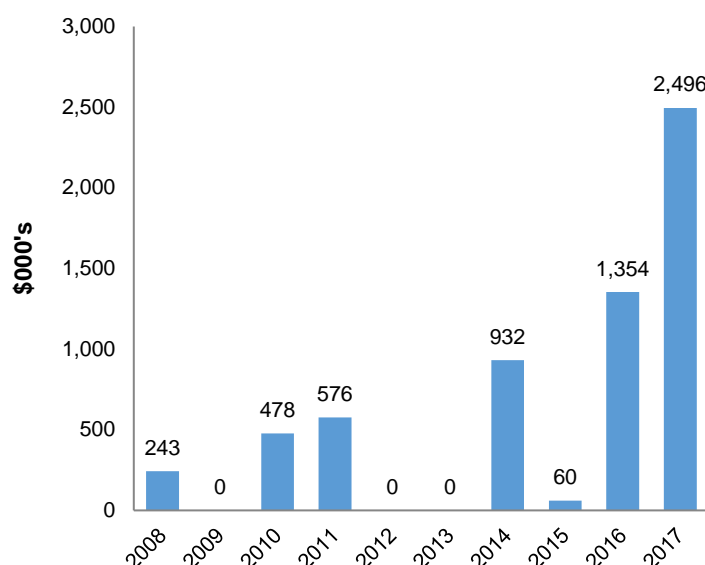
Saskatoon Light & Power was able to balance the final year-end variance by transferring \$1,473,700 to its operating stabilization reserve.

4.7 Operating Stabilization Reserve

A stabilization reserve has been created to address any positive or negative variances that may occur each year within the operating budget. The source of funds for this reserve comes from previous year surpluses. In years when a negative variance occurs, funds are withdrawn from this reserve. Use of this reserve allows the utility to meet its ROI levels without annual variances having an impact on the City's general accounts.

At the end of 2017, the balance in the reserve was \$2,496,000, matching the limit established by Council Policy (1.5% of metered revenue).

Stabilization Reserve Balances
Year End Actuals



4.8 Capital Spending and Capital Reserves

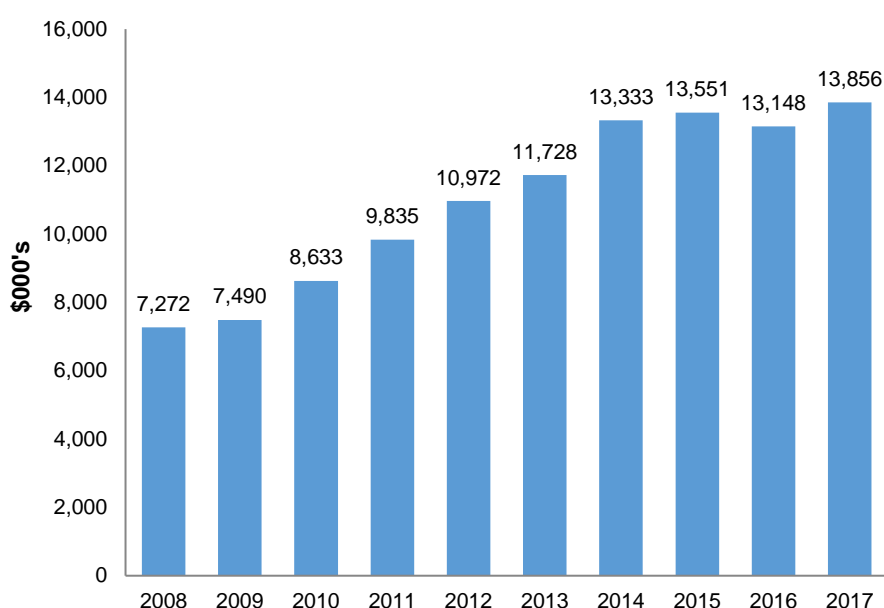
Saskatoon Light & Power funds the extension and replacement of its infrastructure through the use of capital reserves: the Electrical Distribution Extension Reserve (EDER); and the Electrical Distribution Replacement Reserve (EDRR). These reserves receive annual provisions from the utility's operating budget. A review of the sufficiency of these reserves is completed annually to ensure that they will meet the capital expenditures planned in the next five years.

The adjacent chart shows the amount of funds provided to EDER and EDRR over the past 10 years.

Beginning in 2011, there was a concerted effort to increase the provisions to these reserves.

Redevelopment within the downtown core and in suburban centres necessitated the upgrading of electrical infrastructure to handle the increased capacity.

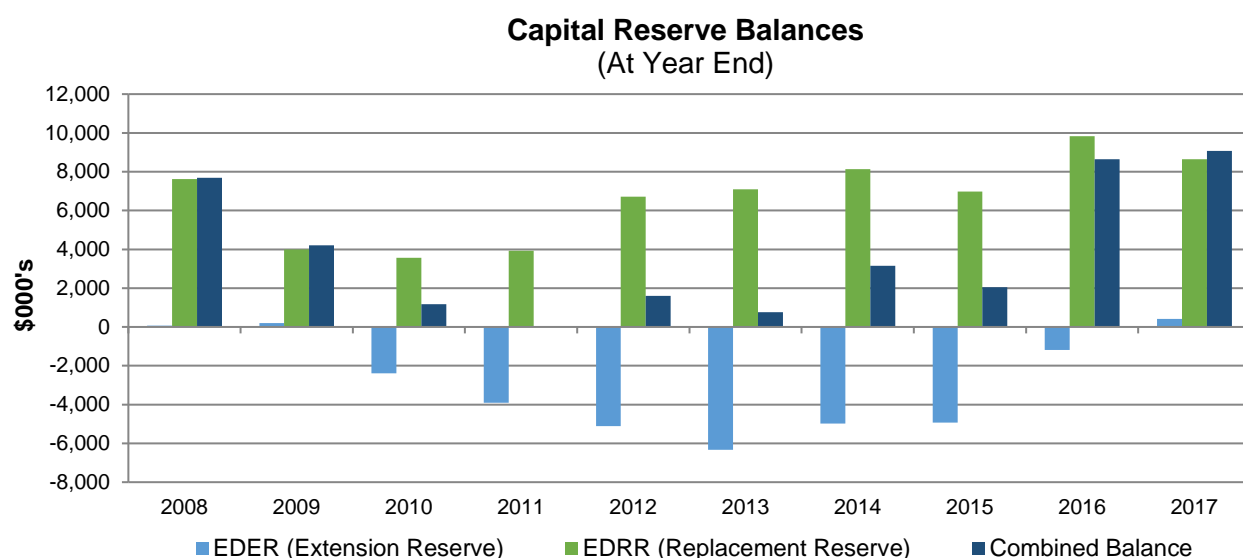
Provision to Capital Reserves
(EDER and EDRR Combined)



At the same time, it was recognized that renewal of the existing infrastructure was an increasing priority.

The provision to capital reserves leveled off over the past four years, in part due to unfavourable rates established by SaskPower that caused the cost of bulk power to increase faster than increases in revenue and in part due to decreasing sales volume. In order to maintain the ROI and address inflationary pressures, it was necessary to postpone further increases to the capital provisions.

An asset management report presented to City Council in 2018 provided a target for future provisions to capital reserves of \$23.1 million.



Also shown are the capital reserve balances for EDER and EDRR as well as the combined value of the two reserves. The utility may run a deficit in one reserve as long as the combined value of the two reserves remains positive.

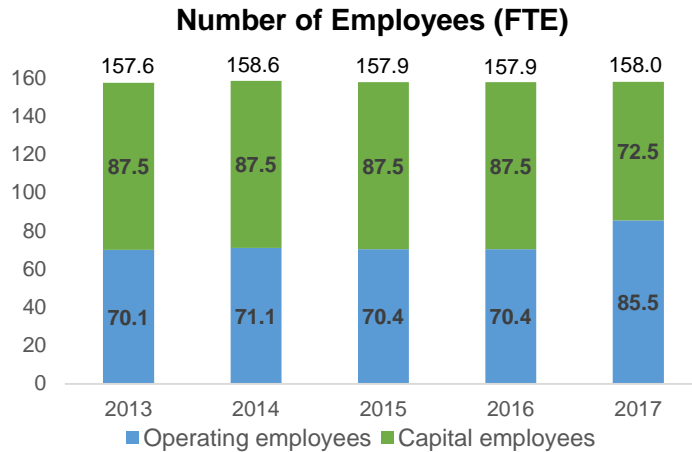
In 2008, the combined value of the reserves was \$7,691,000. Between 2010 and 2015, the balance varied between \$0 and \$3,151,000. At the end of 2017, the balance was \$9,066,000. Saskatoon Light & Power has intentionally left a positive balance to ensure there is sufficient funding if a failure occurs on the system that requires immediate attention. There are also some large capital projects that the utility is preparing to undertake in the future.

5.0 OUR PEOPLE

5.1 Number of Employees

Saskatoon Light & Power had 158.0 Full-Time Equivalent (FTE) positions as of December 31, 2017.

These employees were engaged in administration, system planning, engineering design, construction, maintenance, and system operations.



Saskatoon Light & Power has an extensive operating budget to maintain and operate the existing distribution system as well as a significant capital budget to complete major upgrades and installations.

The utility's staff work on both operating and capital projects throughout the year. Staffing levels have remained relatively constant over the past five years despite an increasing workload.

5.2 Representative Workforce

Saskatoon Light & Power believes that its workforce should be representative of the public it serves.

The following chart shows that while the utility has a higher percentage of staff with aboriginal ancestry than employed by the City as a whole, it is still significantly below the Saskatchewan Human Rights Commission's (SHRC) goals set in 2014.

The other equity groups (visible minorities, people with disabilities, and females) are also underrepresented within the utility. This varies significantly within the different sections of the utility though, with some sections exceeding the SHRC's goals for visible minorities and females.

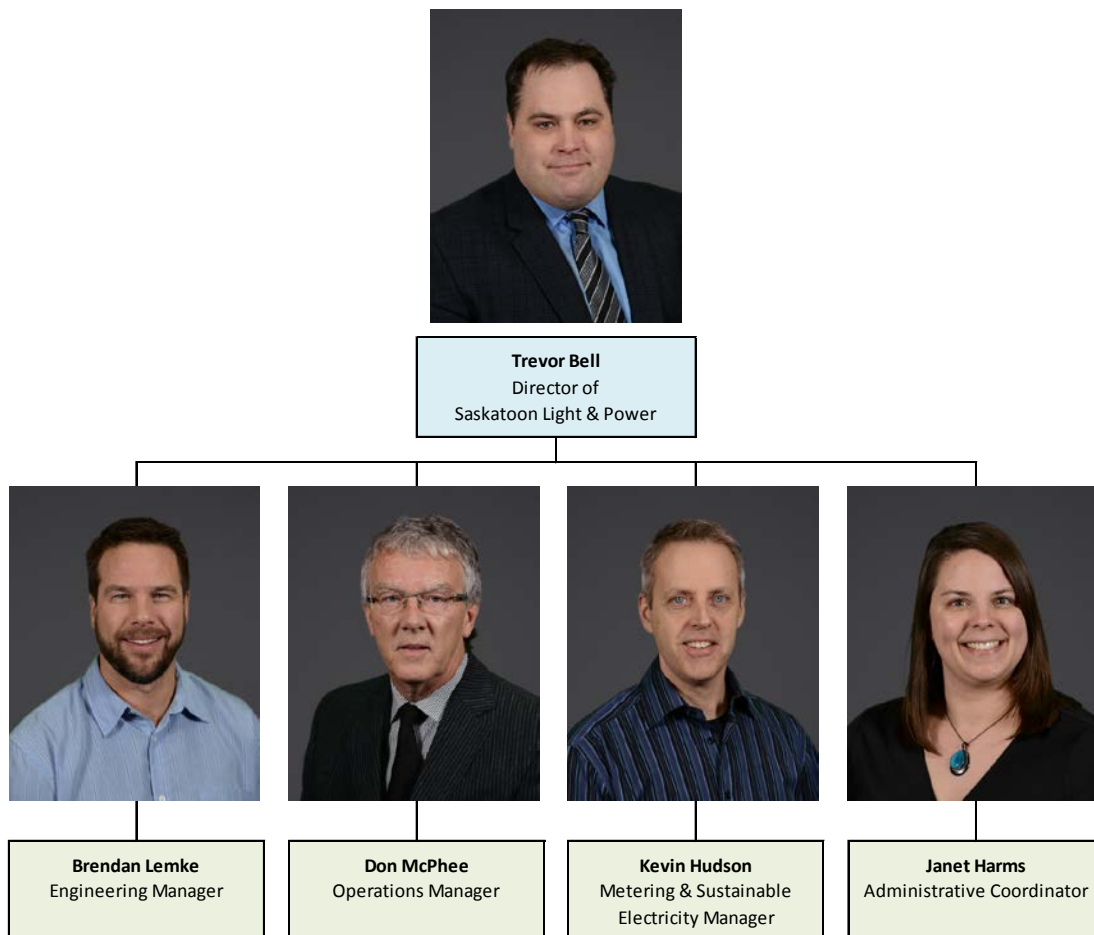


**Percentage of Employees Self-Declared as an Equity Group Member
December, 2017**

Equity Group	Saskatoon Light & Power	City of Saskatoon	SHRC Goals
Self-Declared as Aboriginal Ancestry	10.1%	7.2%	14.0%
Self-Declared as Visible Minority	9.4%	10.6%	11.0%
Self-Declared as Person with Disability	3.6%	3.8%	12.4%
Self-Declared as Female	9.4%	38.0%	46.0%

5.3 Organizational Structure

The organizational chart provides a high level overview of how Saskatoon Light & Power is organized and key positions in 2017.



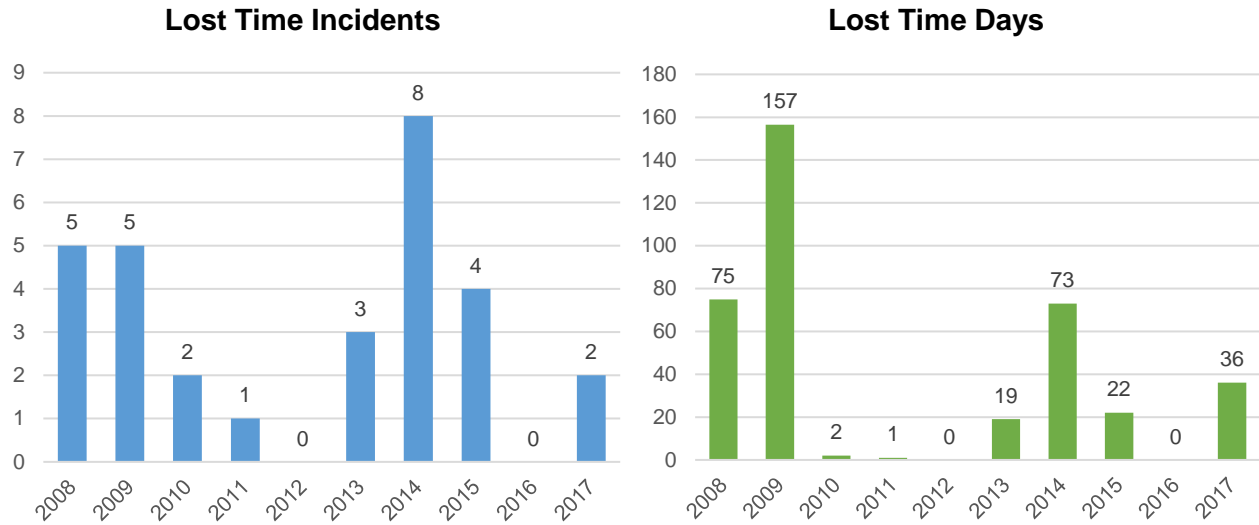
Accounting services for the utility are provided by the Business Administration division. The Corporate Revenue division of the Asset & Financial Management Department provides utility meter reading, billing and collection services common to the electrical, water and sewer utilities.

5.4 Employee Safety

Employee safety is paramount at Saskatoon Light & Power.

The utility has a mature Safety Performance Management System and participates in benchmarking studies with the Canadian Electrical Association (CEA) in a group of similar sized utilities (Group 3: under 300 employees).

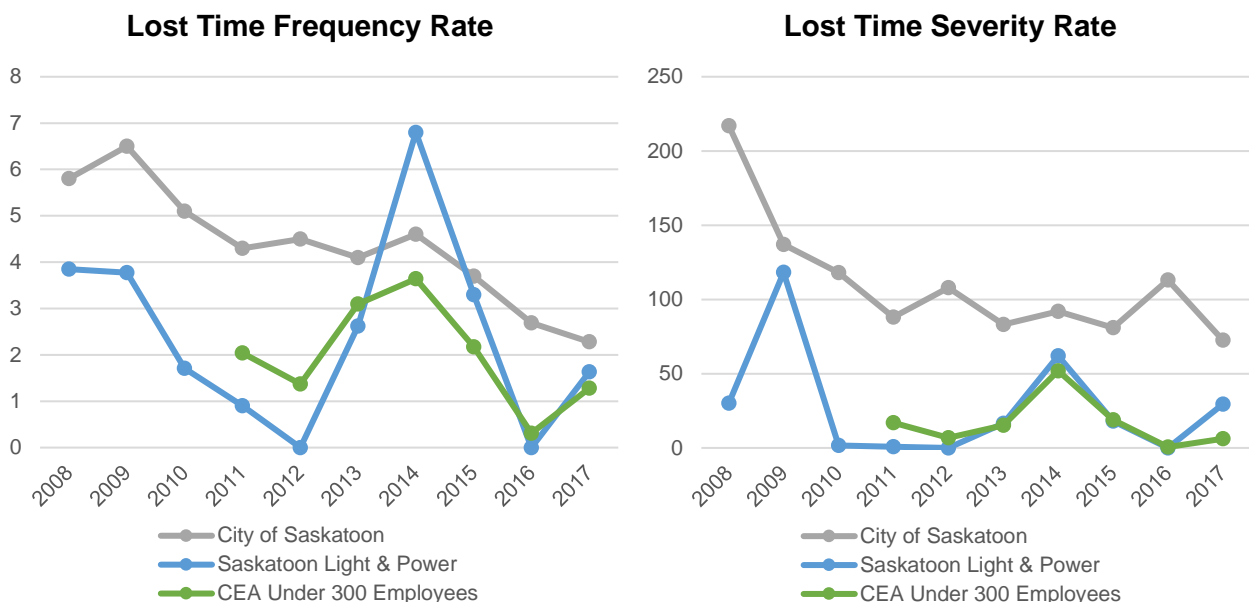
The following two graphs show the number of lost time injuries that occurred at Saskatoon Light & Power over the past ten years and the resulting number of days away from work.



In 2017, Saskatoon Light & Power experienced two lost time incidents accounting for 36 lost time days, which is slightly below the ten year average for the utility.

In order to compare results against the CEA member companies and against the City’s overall average, the number of lost time incidents is expressed as the Lost Time Frequency Rate. Over the past ten years, the resulting average rate for Saskatoon Light & Power was 2.46. This is close to the CEA member companies’ rate of 2.12 (since 2011), but is significantly lower than the City average of 4.36.

Severity is a measure of the number of days missed from work as a result of an injury. For comparative purposes, the number of days missed from work is expressed as the Lost Time Severity Rate. Over the past ten years, the resulting average rate for Saskatoon Light & Power was 27.67. This is above the CEA member companies’ rate of 16.67 (since 2011), but is significantly lower than the City average of 110.98.



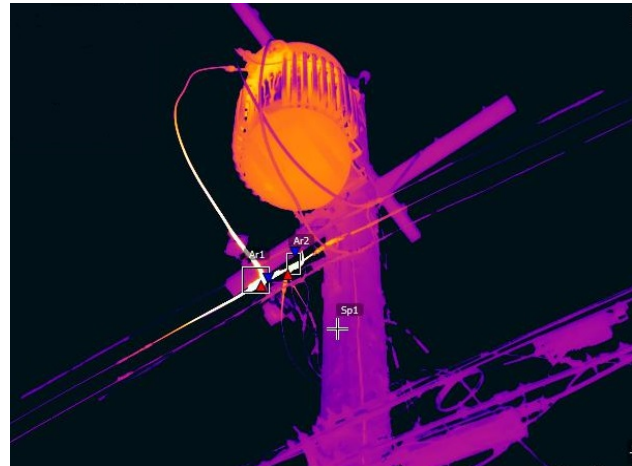
6.0 OUR WORK

6.1 Operating Highlights

Comprehensive Testing & Replacement

Work continued in 2017 to replace key infrastructure that was identified through advanced testing methods as needing replacement.

Thermographic inspections are completed to look for “hot spots” within the distribution system. As electrical components begin to fail, they often generate an increased amount of heat. An infrared camera is used to detect the heat and determine where preventative maintenance is required. For example, in the adjacent image the power lines appear white near the pole. This is not normal and indicates an area of concern. In 2017, more than 100 critical locations were found and repaired prior to a power outage occurring.



Comprehensive testing was also conducted on all high voltage substation transformers. These tests were conducted in 2015, 2016 and 2017 as part of a three year testing program. This diagnostic test determined which transformers were starting to show signs of aging and may need additional maintenance. Saskatoon Light & Power has 20 of these transformers and each is worth approximately \$1 million; therefore, regular monitoring of this equipment is critical.

Tree Trimming

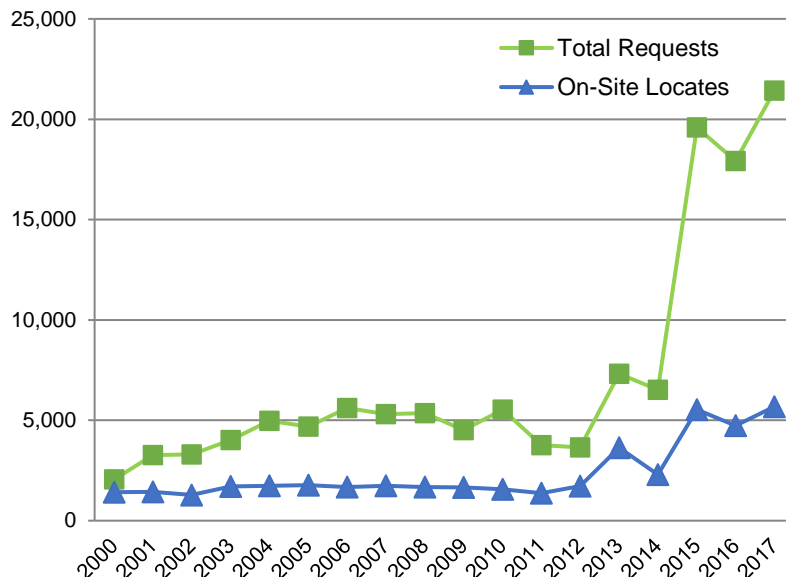
Each year, overgrown trees come in contact with power lines causing service interruptions. Saskatoon Light & Power, therefore, has a tree trimming program aimed at cutting back tree branches to remove this hazard.

Underground Locates

It was once again a very busy year for underground locates in 2017. In 2015, the utility made the decision to join the Sask 1st Call system. The main benefit of the system was to eliminate the need for contractors and residents to contact Saskatoon Light & Power separately from all other utilities. Being part of a province-wide one-call system was aimed at reducing the number of underground lines hit by contractors, improve worker safety, and protect the integrity of the electrical system's assets.



Number of Underground Locates



In 2017, Saskatoon Light & Power received 21,426 underground locate requests through the Sask 1st Call dispatch service, which was a new record high. Prior to implementing this system, the average number of requests was 4,660 annually.

Many of these requests could be cleared over the phone with the customer, but 5,683 on-site field locates were necessary in 2017. This was significantly above the previous average from 2000 to 2014 of 1,778.

Street Light Pole Inspection

A street light pole inspection program was launched in 2015 to prioritize the replacement of poles.

Work on this initiative has continued and 1,412 poles were inspected in 2017. A total of 163 poles were replaced based on these inspections.

6.2 Capital Projects

Saskatoon Light & Power provided funding to 27 capital projects in 2017.

The adjacent chart provides a summary of the spending by infrastructure category. This information does not include any carry-over funding from previous years, but does include customer contributions.

Total funding provided to capital projects in 2017 was \$16,672,000.

2017 Capital Budget	
Category	New Funding
Substations	\$600,000
Communication & Control	\$1,150,000
Transmission	\$1,470,000
Distribution	\$5,905,000
Network	\$1,020,000
Alternative Energy	\$220,000
Metering	\$3,500,000
Lighting	\$2,530,000
General	\$277,000
Total	\$16,672,000

6.2.1 Smart Meters & Automated Metering Infrastructure

Beginning in 2008, a change was made to begin implementing electronic smart meters instead of the electro-mechanical meters that had previously been used. Switching to the new meters was the first step toward implementing an Automated Metering Infrastructure (AMI) system.

By the end of 2017, smart meters had been provided to 98% of the utility's customers (59,700 meters). The target is to complete this deployment by the end of 2018.

Funding in 2017 totalled \$3.5 million.

In July 2016, the communication and computer infrastructure was in place for those meters to be read remotely and the system was activated. Customers with smart meters began receiving bills based on actual monthly reads, eliminating the need for estimates.

This project was a collaborative effort between Saskatoon Light & Power, Saskatoon Water, and Corporate Revenue to implement a single system for both electricity and water meters.

6.2.2 Customer Connections (New and Upgrades)

One of the largest regularly occurring capital projects is for upgrades and extensions of the electrical distribution system due to customer demand for new electrical service or electrical load growth.

There were 96 residential service work orders completed in 2017. Residential projects included line relocations, electrical services to new builds and infill developments, and burying overhead services underground. In addition, there were 26 commercial upgrades completed in 2017.

A total of \$2.42 million was spent in 2017, including \$1 million that was collected from customers for their portion of the work.



6.2.3 Street Lighting

Saskatoon Light & Power currently provides street lighting for 80% of the city and provides lighting in all new development areas.





In 2017, \$2.53 million was budgeted for the installation of new street lights. The vast majority of this funding comes from land developers, with a smaller portion coming from other civic transportation projects. Saskatoon Light & Power invests \$300 per light, matching the long-standing program offered by SaskPower.

The budget included \$60,000 to respond to isolated areas that needed street lighting improvements. An additional \$870,000 was

budgeted to repair street lights that have either been damaged in car accidents or to replace those that were at the end of their lifespan. Saskatoon Light & Power recovers costs from insurance companies whenever possible.

6.2.4 Feeder Upgrades & Replacement

Each year, Saskatoon Light & Power targets key distribution feeders for upgrades or replacement. In some cases, these upgrades are the result of increased demand on the system in that local area, and the lines need to be upgraded to provide more capacity. In other locations, the condition of the distribution system may have led to problems and the infrastructure needs to be replaced.

In 2017, \$2.205 million was budgeted to undertake this type of renewal.

6.3 Continuous Improvement Initiatives

Smart Grid Control System

The first two phases of implementation of a Smart Grid Control system were completed in 2017. This system replaced the existing Supervisory Control and Data Acquisition system (SCADA) that had been in use and added more functionality. It also integrated the data from the Geographic Information System (GIS) and Advanced Metering Infrastructure (AMI) systems. Bringing this data into one control system will allow the utility to better monitor conditions on the system and operate devices remotely. Electrical utilities worldwide are moving toward implementing these systems to improve performance and reduce outages and restoration times.

Future phases will include the implementation of an Outage Management System that will build on this system and provide enhanced communication opportunities to our customers by displaying maps of outages on our website. Future phases could also include energy optimization through voltage control and demand management systems.

Improved Storage Compound & Training Centre

Work began in 2017 to improve the storage compound at Saskatoon Light & Power's main facility located on Brand Road.

The first phase of work involved leveling, paving, and installing drainage to a section of the compound that had never been fully developed. A concrete retaining wall was installed to make the grades blend into adjacent properties.

Once the work is completed in 2018, there will be additional space for the storage of inventory. There will also be additional on-site space that can be used in the future to develop a training centre and facilities to store trailers and seasonal decorations. A report will be submitted to City Council in the future providing options and an economic analysis to build these storage buildings and training centre. Additional property has been leased over the past ten years for these purposes, but this improvement will provide an opportunity to consolidate these uses onto the utility's existing land.

1st Annual Safety Day

Saskatoon Light & Power is proud of the work that has been done in the past to develop a mature Safety Performance Management System, but also recognizes that more must be done each year to keep the focus on working safely every day.

In 2017, the utility held its 1st Annual Safety Day. The purpose of the event was to conduct necessary training and recertification for staff. Activities included pole top rescue, bucket rescue, manhole rescue, pole climbing, tension stringing, locating underground cables and testing hot sticks and rubber goods.

Display booths were also set up to provide information on fall protection, distracted driving, safety clothing and equipment, head and eye protection, and the City's Employee Family Assistance Program (EFAP). Presentations were also made on mental health and addictions.

The event also provided an opportunity for all staff to interact and learn more about all aspects of the utility. In addition to being a safety initiative for 2017, it served as an important employee engagement activity that was well received.

6.4 Community Awareness and Engagement



School Tour Program

Saskatoon Light & Power hosted 39 school tours in 2017 (982 students and 107 adults). The school tour program is designed to complement the grade 6 and grade 9 curriculums. Students learn what electricity is and how to be safe around it. They learn about the environment, social and economic impacts of electricity use in Saskatchewan, and ways to reduce those impacts. They also learn about career opportunities in the electricity industry.

Student Action for a Sustainable Future

Student Action for a Sustainable Future (SASF) is an action and inquiry project for grades 5 through 8 students in Saskatoon. Led by the City, partners include the Saskatchewan Environmental Society, Greater Saskatoon Catholic Schools, Saskatoon Public Schools, Saskatoon Light & Power, and the Sustainability Education Research Institute at the University of Saskatchewan. Supported by the partners, students from several schools develop, implement, and showcase inquiry and actions, which focus on six areas: waste, water, energy, food, transportation, and biodiversity that reduce greenhouse gas emissions in Saskatoon and around Saskatchewan.

The program has been internationally recognized by the Global Partnership for Environmental Education (GEEP) as a Case Study for best practices in environmental education.

United Way Campaign & Volunteering

Saskatoon Light & Power employees and the International Brotherhood of Electrical Works (I.B.E.W. Local 319) have always been strong supporters of the United Way.

In 2017, the employee campaign co-chairs decided to try something new and organized four opportunities for people to volunteer in our community with agencies supported by the United Way.

The volunteer events were planned during Fridays so staff could participate during one of their days off work. A total of fourteen people participated by giving their time and energy to help others in need within our community.

The supported agencies were:

- Saskatoon Foodbank's Garden Patch;
- Friendship Inn;
- Lighthouse Supported Living, and
- White Buffalo Youth Lodge.



CEA Award – Leadership in External Collaboration and Partnership

Saskatoon Light & Power was recognized by the Canadian Electricity Association with the national Award for Leadership in External Collaboration and Partnerships at their annual awards banquet in 2017. The award recognized SL&P's commitment to external collaboration and partnerships with Indigenous Peoples, local communities and other stakeholders.

The award was subsequently presented by City of Saskatoon Mayor Charlie Clark at a City Council meeting. Nathan Ziegler, Sustainable Electricity Engineer, accepted the award on the utility's behalf. He was joined by Saskatoon Tribal Council (STC) Chief Mark Arcand who was representing the partnership between the City and STC to develop a hydropower station at the location of the Saskatoon Weir.



7.0 OUR ENVIRONMENT

7.1 Stewardship

As a division of the City and a member of the CEA, Saskatoon Light & Power is committed to environmental stewardship. The following subsections provide information about specific actions the utility has taken in 2017.

Environmental Management System

Saskatoon Light & Power's Environmental Management Committee is working to reduce the environmental risks associated with the utility's operations.

One of the risks highlighted during the committee's work was the use of sulfur hexafluoride (SF₆). This gas is used in some electrical components due to its excellent electrical insulating properties. Unfortunately, SF₆ is also an extremely potent greenhouse gas and therefore needs to be handled with care.

Employees participated in SF₆ handling and equipment training, and a new SF₆ handling process was developed to prevent the gas from escaping into the environment. Specifications for new equipment exclude the use of SF₆ whenever practical.

Removal of Transformers Containing PCBs

Manufacturers no longer use polychlorinated biphenyl (PCB) in transformers, but when Saskatoon Light & Power's distribution system was developed in the early to mid-20th century, the use of PCB was common.

The utility, along with other utilities across the nation, has a program to remove and decommission all transformers containing PCB above the limit established by the Federal Government. Saskatoon Light & Power currently has 320 transformers containing more than 5 ppm of PCB out of a total of 4,567 transformers owned by the utility. This work is being scheduled to comply with the required deadline of 2024.



LED Street Lighting

Saskatoon Light & Power has been a leader in the implementation of LED lighting in Saskatchewan. After a successful pilot project in the Evergreen neighbourhood, City Council adopted a recommendation from the utility in January 2015 to implement energy efficient LED lighting for all new developments.



By the end of 2017, the utility had installed 2,495 LED lights (9.7% of the utility's total number of lights). These lights reduced total energy consumption by an estimated 962,023 kilowatt-hours annually. This decreased greenhouse gas emissions by 422 tonnes of carbon-dioxide equivalent (CO₂e), which is the equivalent of removing 84 cars from our roads annually. These benefits will continue to grow as more LED lights are installed in the future.

7.2 Clean Energy Projects

Saskatoon Light & Power has set a target to generate 10% of the utility's annual energy requirements from local, renewable resources. Achieving this ambitious target will take a number of years, but the utility has already constructed one generating station with others currently being planned.

Landfill Gas Power Generation Facility

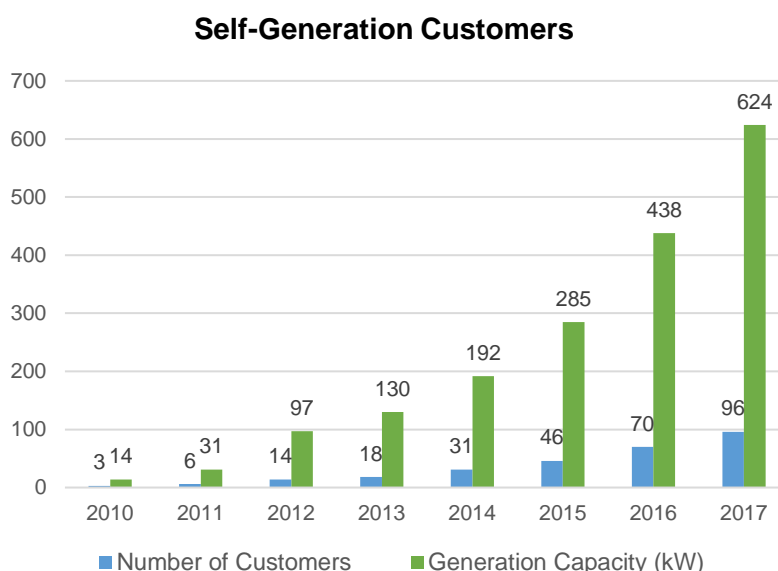
The Landfill Gas Power Generation Facility has been generating electricity since 2014. In 2017, it generated 8,540 MWh of electricity and reduced emissions in Saskatoon by over 50,000 tonnes of carbon-dioxide equivalent (CO₂e) by combusting 6 million cubic metres of landfill gas. This is equivalent to removing over 10,000 cars from the road annually, while powering roughly 1,200 homes.

Customer Self-Generation Programs

The Customer Self-Generation Programs allow customers to generate a portion of their own electricity using solar panels, thereby offsetting their power costs. Through these programs, customers receive credits for generating more power than they need during the day, which they use at nighttime or when they are using more electricity than they can generate on their own.

In 2017, the number of customers taking advantage of these programs increased from 70 to 96, with an average system size of 5.0 kW for residential systems and 13.8 kW for commercial systems.

Combined, all of the solar panels interconnected with Saskatoon Light & Power's grid produce about 551 MWh each year (about 0.05% of the annual electricity sold to customers). This amount of electricity powers roughly 55 homes.



While this accounts for only a small fraction of the electricity used in Saskatoon, the number of connected customers is doubling in size every two years.

Solar Power Demonstration Site

Saskatoon Light & Power commissioned a Solar Power Demonstration plant in 2017. The site has 92 solar panels, for a total of 30.66 kW generation capacity, on four ground-mount arrays.



The site is located at the Landfill Gas Power Generation Facility, and electricity generated by the solar panels provides 21% of the electricity needed to run the facility.

The Solar Power Demonstration Site is a partnership between Saskatoon Light & Power, Saskatchewan Polytechnic, the Saskatchewan Environmental Society (SES), and the SES Solar Co-operative. Saskatoon Light & Power and the SES Solar Co-operative co-own a fixed angle ground-mount array and a manually adjustable

ground-mount array. Saskatchewan Polytechnic provided two sun-tracking arrays on a long-term loan. The Saskatchewan Environmental Society provided seed funding to the SES Solar Co-operative.

The site compares different solar collection systems, in our local climate conditions, to analyze their cost and performance to inform future deployment. The site also creates a source of solar power generation for the SES Solar Co-operative and supports Saskatchewan Polytechnic's Green Energy Laboratory.

Combined Heat and Power Plant at St. Paul's Hospital

Saskatoon Light & Power and the Saskatoon Health Region are studying the feasibility of a Combined Heat and Power (CHP) Plant at St. Paul's Hospital. A CHP Plant produces both thermal and electrical energy at the same time, and does this more efficiently than producing each separately. The thermal energy would be used in the hospital for its heating requirements, and the electrical energy would go to the utility's electrical distribution system.

Hydropower Project at the Weir

The City of Saskatoon and Saskatoon Tribal Council signed an official Memorandum of Understanding regarding the development of a new hydropower generation station at the location of the Saskatoon Weir.

While pre-feasibility studies concluded this project was technically feasible, economically viable, and would cause no significant environmental disruption, the next step will be a full feasibility study for a jointly owned hydropower station at this location.

If constructed, and depending on the various options being explored, this generating station could provide clean energy for up to 3,500 homes and reduce greenhouse gas emissions by 21,000 tonnes of CO₂e.

8.0 OUR CHALLENGES

While the overall performance of Saskatoon Light & Power has remained very strong, there are a number of challenges facing the utility.

Age and Condition of Existing Infrastructure

A significant portion of the utility's assets were installed during periods of significant land development and urban growth in the 1950's to 1980's. These assets are now 30 to 60 years old and are needing to be replaced.

Electrical utilities across Canada have identified that funding for renewal projects has not kept pace with the requirements to maintain the system. The result





is that the average age of infrastructure is increasing. Asset sustainability and reliability will be at risk if not properly managed.

To address this concern, Saskatoon Light & Power has been working to implement asset management principles into its decision making processes. Work has also begun to establish service levels and key performance indicators.

Preparation of an asset management report occurred in 2017 and was made available to City Council in early 2018. The report identified the overall condition of the utility's assets and determined the level of capital spending required annually to address both renewal and growth issues.

Distributed Generation and Rates

Installation of distributed generation systems, such as solar panels on the roofs of homes and businesses, can provide customers with a clean source of energy. However, the existing utility rate structure does not take this growing trend into account, and does not adequately address the costs incurred by the utility to provide a backup power distribution system for these customers.

Distributed generation systems typically do not meet the full needs of the customer, so customers still rely on the utility for a portion of their power and for a backup supply when their system fails. The reduced amounts collected from these customers do not provide sufficient funding to maintain the extensive distribution system that is necessary to serve all customers.

Saskatoon Light & Power will continue to explore solutions to this issue in collaboration with SaskPower.

9.0 CONCLUSION

The overall performance of Saskatoon Light & Power remained strong in 2017. The utility is debt-free and provides a significant return on investment to the City. Reliability statistics show that the utility meets or exceeds the CEA Urban Average and is able to restore power faster than average when the power does go out.

Saskatoon Light & Power is fortunate to have a dedicated and skilled group of employees. The success of the utility is a direct result of their efforts over the past year. The guidance and support of the Transportation & Utilities Department General Manager, City Manager and City Council are also greatly appreciated.

10.0 APPENDIX

10.1 History of Saskatoon Light & Power

The municipal electric utility was started in 1906, with a small generating plant of 225 kilowatts located on the riverbank at Avenue H and 11th Street. Initially, service was provided at night time only for lighting purposes, but by 1908, 24-hour service was available.



By 1911, the extremely rapid growth in demand for electricity forced the City to construct a new coal-fired thermal generating plant on Avenue A south of 19th Street (A.L. Cole generating plant). Plant expansions brought the generating capacity to 10,000 kilowatts by 1919.

In 1928, the City sold its power plant to the Saskatchewan Power Commission, which began selling electricity in bulk to the City for distribution to its customers. The plant was the single source of

supply for Saskatoon at the time.

The Queen Elizabeth Power Station was constructed by SaskPower in 1959 and is still generating power at its location just south of the Saskatoon Landfill. In the early 1980's, the A.L. Cole plant was then retired.

In the early 1960's, SaskPower continued its expansion and took over many of the municipal utilities in the province, including the City of Regina's utility in 1965. At that time, the City of Saskatoon decided not to sell its electric utility and opted to continue operating to provide electrical services to businesses and residents.

The franchise boundary for the utility was set by provincial legislation based on the 1958 municipal boundaries. The franchise area has not changed significantly with the expansion of the city, and SaskPower serves the portion of Saskatoon outside of this area.

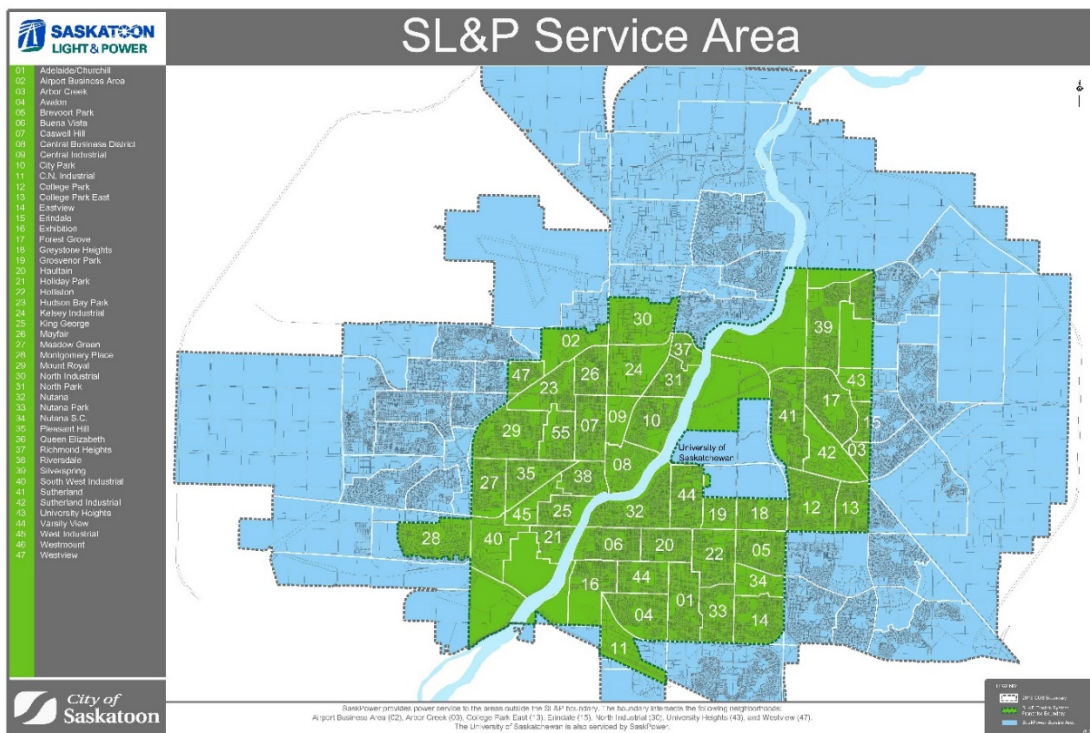
In December 2004, City Council approved Saskatoon Light & Power as the new name for the City's electric utility.

Saskatoon Light & Power is the largest municipal utility in the province and is SaskPower's largest single customer.

In March 2014, Saskatoon Light & Power once again began generating electricity by commissioning the Landfill Gas Generating Station. The 1.63 Megawatt facility produces enough electricity each year to power 1,200 homes. Annual greenhouse gas

emissions from the landfill were reduced by over 50,000 tonnes (the equivalent of removing 10,000 vehicles from Saskatoon's roadways).

10.2 Franchise Boundary



10.3 Lighting Boundary

