

### 4.1 BILLING DATA REVIEW

A Preliminary Energy Use Analysis (PEA) can assist in determining where potential energy and cost savings are within the building. An analysis of the historic energy use based upon building information provided for a desktop study provide auditors with the basis for building operations, energy uses and performance.

The bills data provides an energy usage pattern over the course of a year, this provides a benchmark for continual energy usage, however as data has only been provided for 6 months, the energy usage cannot be verified as consistent and verify the data as indicative of a typical year – nor does it even represent a full year.

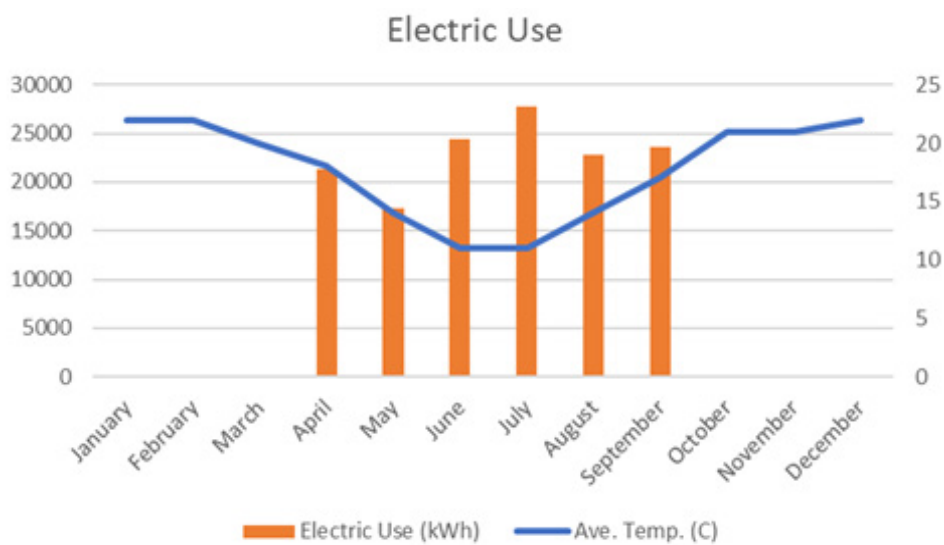


Figure 2 - Monthly Electricity Use

Figure 2 shows the utility use on a month by month basis, noting that we currently only have 6 months of data.

The meters were read by the audit team on 2 consecutive days on Thursday 7th and Friday 8th. The readings were as follows:

	7 <sup>TH</sup> FEBRUARY 16:00	8 <sup>TH</sup> FEBRUARY 14:30	USAGE
<b>Peak Load (kVA)</b>	82	82	-
<b>Reading 1 (kWh)</b>	825,547	825,928	381
<b>Reading 2 (kWh)</b>	543,636	543,918	282
<b>Reading 3 (kWh)</b>	554,125	554,380	255

The period was not quite a period of a day, so cannot be used as a full indication of 24hours use, however it does give some indications as to typical usage. In this case a total of 918 kWh was used which amounts to 999.42 ZAR (92.50 CAD).

By taking the last billed meter readings and the meter reading read by the audit team an average

## 4.0 PRELIMINARY ENERGY USE ANALYSIS

daily use of 790 kWh was used over the period (23,700 kWh per month). This is similar to billed readings in April and September which could suggest that the energy use is fairly stable over the summer period. Indeed, the average daily temperatures stabilise which should mean that air conditioning load will also stabilise over this period. Figure 3 shows the assumed monthly electrical loads for the summer months.

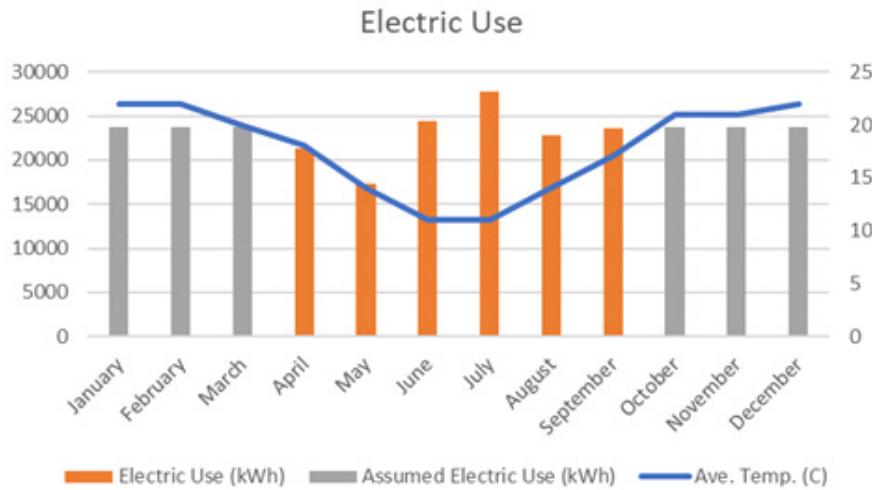


Figure 3 - Assumed Monthly Electricity Use

## 4.2 ENERGY COSTS AND UTILITY RATE STRUCTURES

Eskom, a South African electricity public utility generates, transports and distributes approximately 96% of South Africa's electricity (and is responsible for almost half of all electricity across the entire continent) although for the most part the actual supply is through the local municipality. Electricity at the Canadian Embassy is supplied through the City of Tshwane Department of Public Works. Almost all of Tshwane's electricity comes from Eskom.

Electricity is now available almost everywhere in South Africa. Access to electricity increased from 35% of households in 1990 to 84% in 2011 (StatsSa 2012). With the growth of the population, business and industry, electricity supply is sometimes under pressure, particularly in densely populated urban areas when usage reaches a peak, resulting in a power outages. Eskom, in association with the South African government, have prioritized the extension of the South African electrical grid with the construction of new power stations, diversification of power sources and instituting energy efficient programs.

Keeping the power system balanced at 50Hz, as per international standards, is critical to prevent a nation-wide blackout and when the national electricity grid is under pressure with normal measures implemented, Eskom must reduce demand, as agreed with the National Energy Regulator (NERSA), and implements a process of Load Reduction which has two components:

- Load Curtailment, whereby large industrial customers reduce electricity consumption by up to 20% when it is urgent to balance the system.