Environmental Cost of Operation of the Casino's 24 - 4000W SkyTracker SLX 4000 Spotlights

(Total cost of all 24 tendered lights at all Saskatchewan SIGA casinos).

The 4,000 watt spotlight would be using a Xenon gas filled bulb and would require a ballast to operate. The actual wattage would be about 4,500 watts (including the ballast wattage). The rated light output is 332 million candle power, or about **4 billion lumens**, over 2,000,000 times the light output of a 100 watt incandescent bulb. (ref. 1 candlepower = 1 candela = 4 * pi lumens)

If the spotlights are operated from dusk to dawn, approximately 4, 121 hours per year should be used (in Saskatchewan) to determine operation time for outdoor lighting using photo control sensors. (ref. a comparable 100W streetlight uses 135 watts including the ballast wattage or 556 kWh per year.)

If the spotlights would operate from dusk to 2:00 AM, the hours that were estimated (2,739 hrs per year) that would be about 7.5 hrs per day.

The electricity rate for the facility would be $0.0856/kWh for the first 15,500 kWh used in the month with the balance at $0.05133/kWh for the remaining electricity used in that month. To determine any energy use calculation and the electrical cost to these spotlights, the balance rate should be used as other electrical items in the facility would be making up the first 15,500 kWh per month.

Also consider the cost for the replacement of the Xenon bulbs. A brief Google® search and reference from the Mystic Casino article show that the bulbs only last 1,000 hours and cost $1,000 to $1,400 USD each. Also, the spotlights can come with coloured filters such as red.

Electrical cost to operate 24 - 4,000W spotlights for 7.5 hours (on average) per night.
kWh = [(24 spotlights) x (4,500 watts/light) x (7.5 hours/day) x (365 days/yr.)] / 1,000 = 295,650 kilo-watt hours (kWh) per year

Cost = (295,650 kWh) x ($0.05133) = **$15,175.71 per year**

The replacement cost of the Xenon bulbs.
Bulb cost = $1,500 CAD
Bulb hours = 1,000 hours (the rated hours for any type of bulb is determined by a sample size that 50% of the bulbs would burn out before their rated life and 50% would operate beyond their rated life.)
Hours of operation per year = 2,739 hours
Bulb replacement per year = 2.7 bulbs per year
The total cost does not take into account the labour cost to change about (4 sites x 16 bulbs/site = 64) bulbs each year, as each bulb will not burn out at the same time.

Cost = (4 sites) x (6 spotlights) x ($1,500CAD bulb cost) x (2.7 bulbs replaced per fixture per year) = **$97,200 per year**

Annual combined operating and maintenance costs.

Total costs = ($15,175 for electricity) + ($97,200 for bulbs) = **$112,375 per year**

Greenhouse gas emissions from operating these spotlights in Saskatchewan.

SaskPower's electrical system CO2 emissions per kilo-watt hour = 0.82 kg of CO2 per kWh

kg of CO2 = (295,650 kWh) x (0.82 kg of CO2 per kWh) = **242,433 kg of CO2 per year** (or about 242 tonnes of CO2 per year)