Optimised Current – A Lower Energy Future For Stage Lighting

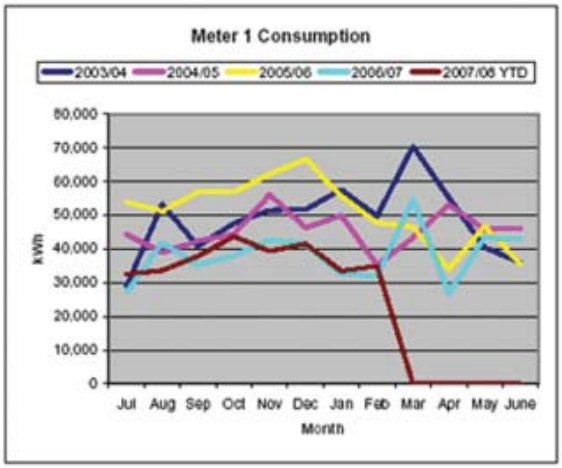
Working with the world's leading lamp manufacturers, Selecon's in-house Research & Development team has pioneered the development of optimised current lamps for entertainment lighting with **Selecon's electronic 80V Power Supplies**. Combined with the low voltage 80V 1200W lamp, this unique Power Supply utilised with either a **Pacific ellipsoidal** or the **Rama 175mm High Performance Fresnel** delivers as much light on to the stage as a traditional 2.0/2.5kW luminaire in a much lighter weight, more compact luminaire which frees up space on the lighting bar and relieves technicians from the stress and strain of rigging large, heavy units. Light output is of a highly desirable quality with an increase in colour temperature – at 3300K the pure, brighter whiter light ensures vibrant colour and dramatic highlights. In addition to the significant reduction in the lighting load energy requirements which can be as much as 40-50% is the reduction in the heat generated by stage luminaires in auditoriums which is a major contributing factor to the air conditioning plant load. The potential 50%+ reduction in the overall heat load, together with the Pacific active heat management system directing more heat out of the beam provides the scope for the air conditioning engineer to make substantial reductions in energy costs and system capacity. Selecon's 80V Power System represents an important and, in light of the world focus on energy efficient solutions, relevant tool for lighting designers and venues to seriously consider when thinking about replacing high wattage stage luminaires.

Case Study: Civic Theatre, Newcastle, NSW, Australia

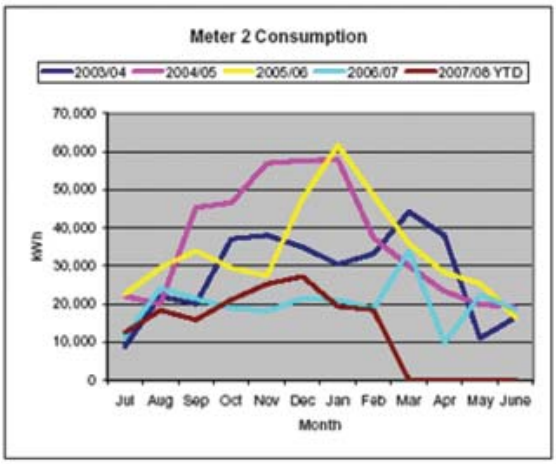
In 2005 the Civic Precinct Technical Services Team at the Civic Theatre in Newcastle, NSW, Australia entered the Newcastle City Council Employees Energy Smart-Water Wise Innovation Awards; an internal initiative instigated by the Green Energy & Water Team who were looking for ways to minimise the use of town water and energy within the Newcastle City Council environment. The Technical Services Team's electrical energy-saving submission detailed the environmental and financial benefits that replacing 26 aging, maintenance-intensive 2.5kW FOH stage lighting instruments with new energy-efficient luminaires would bring to the Theatre. They argued that this potential replacement of half of their total FOH lighting rig would result in increased illumination with 48% less power consumption and because of the reduced heat output shutters and gel would be less like to burn out and the cost of replacement lamps were less expensive than those for the Strand Alto Zoomspots. This entry proved to be a winner and resulted in the installation of 26 **Selecon Pacific Zoomspots** fitted with the 80V Power System and 1200W lamp. Two years on in October 2007, backed by proven and documented energy-saving results the Civic Theatre team were rewarded with a second allocation of 24 units making the entire FOH lighting rig 1200W 80V Pacifics. Since then the City of Newcastle has compiled and released an Electricity Consumption Graphs report (dated February 2008) which shows electricity usages for the Civic Theatre over the past five years and the two full years that the 1200W 80V units have been in use at the Theatre (2006/07 and 2007/08) make for interesting reading, based on similar event / days of usage.

Total events / days of usage per year split into Professional and Community Events

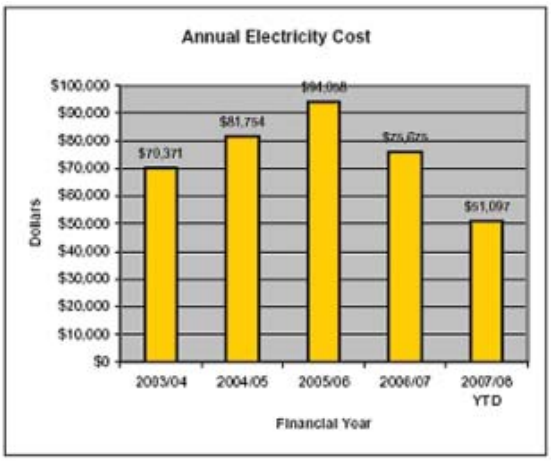
Year	Professional Events Events / Days	Community Events Events / Days
2005	39/91	24/44
2006	38/119	26/90
2007	54/121	35/74
	Approx same days as previous year	
2008 YTD	36/120	20/55
	With 3 months to go days are at '07 level	

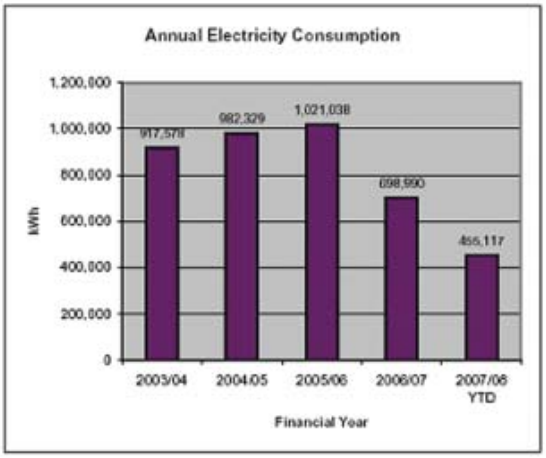


The Meter 1 Consumption graph is for the air-conditioning system only and we can see from the graphs of total KWh consumption that years before the 80v system was installed were between 540,000 - 620,000 kWh and in the first year (2006-2007) when half the FOH rig was 80v the consumption reduced to 450,000 kWh. Year 2007-2008 YTD with approximately the same amount of shows and the balance of the FOH upgraded to 80v system, the consumption has dropped to 300,000 kWhs.



The Meter 2 Consumption graph covers the balance of power to the theatre including cool rooms, fridges etc which all of this power consumption is consistent 24/7 and for the balance of the year. The largest consumer of power on this meter is the stage lighting. The years before the 80V system was installed total consumption was between 350,000 - 425,000 kWhs and in the 2006/2007 year (first 80V upgrade) consumption dropped to 240,000 kWhs and in the current year (2nd 80V upgrade) the consumption has dropped to 165,000 kWhs.





Summary

Prior to the 80V upgrade annual power consumption for the Theatre had reached 1,021,038 kWhs at an annual cost of $94,058. In 2006/07, following the first full year of the upgrade power consumption was 698,990 kWhs at a total cost of $75,675 – total savings over one year: $18,383.

The initial 80V upgrade was then extended to the complete FOH lighting system which for the current period YTD (2007/2008) and has resulted in a total power consumption of 455117 kWhs at a total cost of $51,097 year to date, with the same amount of shows completed as compared with previous years. This would mean a total saving of nearly $43,000 over the year against the original lighting system.

80V power system (rear view)

80V DMX power supply connection diagram

Photo: Greg Hicks

Pacific 80V power system hook

Rama 80V fitted with Barndoor

"Newcastle's Civic Theatre may be 75 years old but it is light years ahead in energy efficient illumination thanks to Selecon", Dave Grinstead, Operations Director.

Up until now Selecon's 80V Power System has used the dimmer output to drive an electronic variable power supply. This solution is now complemented by a direct mains supply, DMX controlled power supply, which uses the same mains power and control network required for moving lights, doing away with the need for a separate dimmer and delivering further cost savings. The Newcastle Civic plans to further lighten their energy load with the replacement of their current 2000W Fresnels with Selecon Rama 80V units in the New Year.

For further information on Selecon's unique 80V power supplies and additional case studies:
www.seleconlight.com/pacific80v