Case Study #25

Voltage Power Optimisation

powerPerfector
energy saving like no other

Energy savings on show at the Barbican

Why it is interesting: The Barbican is Europe's largest multi-arts and conference venue, presenting a diverse range of art, music, theatre, dance, film and creative learning events, it is also the home of the London Symphony Orchestra. Such complex sites bring complex challenges. This Case Study looks at how powerPerfector meets these challenges.

The Barbican multi-arts & conference venue

Annual Savings	
kWh:	7.45%
CO_2kg:	152,800
£:	23,400
ROI:	18%

Don't take our word for it...

"powerPerfector *has delivered an energy saving solution that really made an impact."*

Richard O'Callaghan
Project Manager

barbican

Further information

For information on this, or any of our case studies, please contact:

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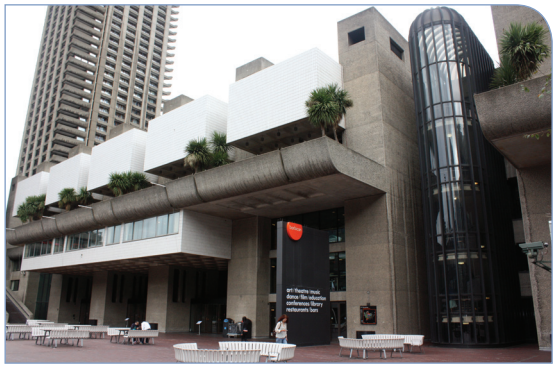

With such a packed schedule of events, making infrastructure improvements at the Barbican can be a logistical challenge.

Having installed powerPerfector units in over 4,500 buildings in the UK, our team has a deep understanding of what our clients expect during installation, in order to minimise disruption to their operations.

Because a powerPerfector installation requires an electrical shutdown, we arrange the vast majority of installations at the most convenient time for the client. At hotels, for instance, that's usually between morning check-out and afternoon check-in, for a 24 hour supermarket we'll shut the site down in the early hours of Sunday morning, before it reopens for trading.

For acute hospitals, we'll arrange back up generation or an on-site UPS to ensure that power is never lost.

Typical of most large sites, the Barbican has a number of individual electrical supplies, more than 25 in total. These are spread across the centre.

Following a survey of the site by an electrical engineer and with the help of the Barbican team we identified a suitable area in which to trial the technology. Six supplies entered the building near to the library, a small portion of which was reallocated to house the six VPO® units required.

As with all powerPerfector installations, to minimise disruption, all site works were completed prior to the shutdown. This includes cabling, trunking and any changes needed to the existing switchgear.

The six units were then delivered to site and energised in three tranches over a ten day period. This allowed the installation team

to systematically ensure that all electrical equipment on site was functioning effectively at an optimised voltage.

"We were impressed with the professionalism of the powerPerfector *installation team, which meant the installations were completed without incident,"* said Richard O'Callaghan, Project Manager, Barbican Centre. *"It was one of the easiest energy efficiency installations we have completed to date."*

Long term partnership

powerPerfector started working with City of London Corporation to reduce its energy costs and carbon footprint in 2008.

VPO® is already in use at Sundial Court, part of the Guildhall School of Music & Drama and in two office sites within the wider City of London Corporation estate.

The voltage optimisation implementations at Sundial Court, Walbrook Wharf and Bernard Morgan House led to savings of 11.3%, 11.4% and 10.7% respectively.

Three months after installation, EEVS Insight began to calculate the savings. Using the International Performance Measurement and Verification Protocol (IPMVP) the savings for the project as a whole were calculated to be 7.45%. This represents an annual saving of £23,404.

The saving was just under that guaranteed by powerPerfector of 7.49%. Further investigation revealed that since the tender was submitted, a lighting refurbishments had taken place which impacted on the savings.

"The savings the units have achieved make this an attractive energy efficiency measure. We are working with powerPerfector *to identify other opportunities accross the Barbican estate,"* added Richard O'Callaghan.

Multiple loads

The six units within the Barbican cover electrical supplies ranging from a cinema, to catering and fountains. Different electrical equipment reacts differently to an optimised voltage. The energy use of most types of lighting will be reduced by supplying it at the correct voltage, this includes incandescent lighting and fluorescent systems with a reactive ballast.

For lighting systems with an electronic ballast there is less direct effect on energy use, but these systems are responsible for generating higher levels of harmonic distortion than a reactive ballast. As the powerPerfector helps to filter harmonic distortion, the efficiency of a site with electronic fluorescent lighting can be improved.

Similarly, there is a substantial opportunity to make savings where motor equipment is 'direct online' and running at part load. However, when a variable speed drive is in use, the motor's power supply is managed by the drive, so there is a reduced direct effect from the powerPerfector. Savings are made by filtering the harmful harmonic content these drives sometimes generate.

The powerPerfector's ability to attenuate harmonics and suppress common transients maximises the lifespan of sensitive electronic equipment including those mentioned above.

A full load assessment is undertaken by a powerPerfector engineer prior to installation, to appraise the likely savings, based on the specific mixture of electrical loads at your site.

Savings on site

Site name	Unit size	Optimisation setting	Installation date	Savings
Feeder 4: Catering	350 pP	9%	09/07/2012	8.0%
Feeder 5: Theatre	280 pP	8%	09/07/2012	8.6%
Feeder 6: Catering	150 pP	10%	19/07/2012	13.6%
Feeder 8: CSPR	150 pP	10%	10/07/2012	4.9%
Feeder 9: Foyer	150 pP	10%	10/07/2012	3.6%
Feeder 11: Lakes	210 pP	10%	19/07/2012	7.6%

There are a range of case studies and client testimonials available on our website, please visit **www.powerperfector.com** for further information.

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