MUSEUM DEVELOPMENT EAST MIDLANDS

GREENER MUSEUMS CASE STUDY
NATIONAL JUSTICE MUSEUM

WHY GREENER MUSEUMS?

Located in the heart of Nottingham, the National Justice Museum (NJM) is a large, complex site comprising 5 main blocks built in the 18th and 19th centuries and a cave system dating further back. In addition to the galleries, courtrooms, private hire rooms and old police station, the site also accommodates six tenant organisations.

Established in 1997, the museum's original lighting, heating, ventilation and cooling systems have either failed altogether or become difficult to control and very expensive to run.

A number of opportunities, including replacing lighting and heating controls, were planned for their 2016/17 HLF project, however in order to build on this momentum and access wider grants NJM joined the **Greener Museums** programme. The provision of impartial advice on future priorities and gaining a deeper understanding of the facts and the figures of their energy and water uses were key drivers for joining.

REVELATIONS OF THE PROCESS

Energy and water management is an ongoing challenge for most sites, however at NJM, the ability to pin-point inefficiencies is significantly impaired by the size and complexity of the site, the presence of tenants and an inadequate number of sub-meters. However as a large user of electricity (circa £33,000 per year) the site does have a meter that measures usage every half an hour. This data is provided by the electricity supplier and enables a detailed understanding of electricity usage to be gained with applied analysis techniques.

In relation to NJM, it highlighted that around 41% of electricity is used out of hours. In fact the museum is estimated to account for just 38% of the total bill.

> **"What stood out to me was 41% of our electricity usage was happening when we had closed all of the doors and that is the kind of thing we are using this report to get into."**
>
> **Gary Holmes, General Manager**

Annual water costs are currently higher than gas bills at NJM. Analysis of 6-monthly water bills indicated that abnormally high usage could be attributed to non-museum uses and/or leaks on site. Benchmarking against a similar museum profile indicated that NJM's water costs are £4,000 above expected levels and approximately 50% of the bill is potentially attributable to tenant usage. The review explored ways of limiting the site's exposure to water leaks and waste (e.g. taps left on) as well as improving ability to monitor usage.

The museum uses gas to fire 8 large boilers located around the site. Analysis of the monthly gas data indicated that usage is relatively high over the summer months when the heating system is switched off. Whilst the boilers are old and manually controlled, this was unexpected. Experiments undertaken by the General Manager revealed that non-museum usage of gas over the summer months is likely to be significantly higher than initially estimated.

Insights afforded by the data analysis motivated further investigations by the General Manager and Finance Team to identify root causes and savings initiatives.

OUTCOMES AND PLANS

The compelling figures arising from the review led to Operations staff, the Finance Team and Senior Management working together to address abnormally high usage of water, out of hours electricity and other utility usage. These alone could lead to savings of £6,000 per year or more. There are also plans to reinvigorate staff awareness and engagement through increased management commitment and involvement in the process.

Assisted by the MDEM small grant, the museum has installed new push button taps to limit exposure to water (and electricity) wastage. Also under investigation is the installation of washroom controls that shut off water to toilets and basins when the space is unoccupied in order to limit leakages in these high risk areas.

Analysis of post HLF electricity usage shows that new LED lighting is forecast to reduce lighting costs by at least £2,500 per year, enabling accommodation of additional audio visual and air conditioning equipment without increasing overall running costs. New boilers, heating controls and secondary glazing have also been fitted to one of the blocks and gas usage will be monitored to identify impact prior to rolling out to the other blocks.

Increased monitoring of data will be assisted by requesting more regular water invoices. Also under investigation is the use of equipment that enables utility data to be automatically fed through to management software, saving staff a substantial amount of time and providing early alerts to issues.

"This report has given the organisation a lot of power to actually sit down and critically evaluate our environmental issues. It's the catalyst for going forward and reducing our energy usage."

Gary Holmes, General Manager

Push control taps

LED lighting in the main hall

Annual energy and water costs: £54,860 (2015/16)

Savings identified: £11,000 (20%)

Annual CO_2 savings: 43 tonnes

To hear the full audio case study by members of the National Justice Museum please go to www.mdem.org.uk/case-studies/greener-museums-case-studies

ABOUT THE GREENER MUSEUMS PROGRAMME

In 2016/17 museums joined the **MDEM Greener Museums** programme to access specialist advice and support from a dedicated Advisor. Museums received an on-site review to identify opportunities to become greener and more resilient, followed by a report and action planning development meeting. An MDEM small grant was also made available to museums on the programme.

Greener Museums is part of the wider Museum Development Programme run by MDEM and funded by the Arts Council England. To find out more please go to: www.mdem.org.uk/green-museums-2016