

TITLE:

Energy Performance and Estates Condition Surveys at Heriot Watt University

DATE:

October 2007

INSTITUTION PROFILE

HE

6,500 FTE students

1,500 staff

City (outskirts)

SUMMARY

Heriot-Watt University in Edinburgh appointed Property and Construction Consultants, Dearle and Henderson, to undertake an Estates Condition and Compliance Survey for their Riccarton Campus. To ensure compliance with the new EU Directive on the Energy Performance of Buildings they asked that the survey also include a review of the buildings' energy performance. Heriot Watt now has Energy Performance Certificates for 56 of its 80 buildings at their Riccarton campus.

EAUC COMMENT

This case study shows the benefits of having accurate data on the energy performance of buildings. By knowing which buildings are less efficient than others it is possible to influence future investment in the Estate.



PROJECT PARTNERS

Heriot-Watt University, Dearle and Henderson, Property and Construction Consultants, IES Ltd (UK).

THE PROBLEM

With a lack of accurate information on energy performance of individual buildings Heriot-Watt identified the need to undertake detailed audits and site surveys to ensure they could comply with the EU Directive and its request that energy performance certificates be available for all buildings.

THE APPROACH

An initial review of historic drawings, construction data and site surveys was undertaken. Information from the review was fed into computer software which produced 3D imagery of the buildings.

Attributes (e.g. building details, heating, lighting, activity, location and weather) were attached to the geometry and simulations representing actual (based on building as built with actual U-values) and notional (based on building as compliant with Scottish Building Standards Section 6 or English Building Standards 2006 Part L) situations were undertaken. This produced an amount of carbon dioxide produced per building (kg/CO₂/m²) which gave the calculated "as designed" performance of the building/s.

Finally the results between the two simulations were compared, certificates were produced and log books developed.

GOALS

First and foremost Heriot Watt was aiming to ensure compliance with the new EU Directive on Energy Performance of Buildings and identify ways they could improve the energy performance of its buildings. In addition to this they aimed to use the information to help:

- Target capital investment in energy efficiency measures
- Target areas to reduce CO₂ emissions
- Develop actual performance measures of the buildings and comparing this with the measured performance

OBSTACLES AND SOLUTIONS

- Lack of built data for some buildings
- Lack of information of plant and its uses
- Lack of adequate data on methods of measuring Building Performance due to changes or proposed changes to Building Regulations
- An on site assessment of buildings was undertaken
- An on site assessment of building plant and operations was undertaken
- Await finalised measurement guidance from Scottish Building Standards Agency and English Building Standards Agency

PERFORMANCE AND RESULTS

The University now knows the designed performance of its buildings, the majority of which are more than thirty years old.

The University has certification for 56 of its main buildings which require certificates under the EU EPBD legislation, such as Residences, Academic Buildings and Administrative Buildings.

The University is demonstrating best practice in identifying the energy efficiency of its current Estate. The information obtained from the review will support the Estate Strategy of the University in identifying areas for investment in energy efficiency measures to reduce the University's overall CO2 use / footprint.

LESSONS LEARNT

The main lessons learned were:-

- It can be challenging to be at the cutting edge of the implementation of new directives as it is often difficult to source suitably trained Assessors and keep up to date with changes and delays associated with new legislation
- Being able to provide the Energy Assessors with good records of the building construction meant the data and 'as designed' calculation is more accurate
- Having good sub-metering allowed the measured 'operational performance' to be added to the certificates

FURTHER INFORMATION

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IES Ltd (UK) software system for integrated building performance analysis tools for use by architects and engineers, planners and facilities managers.
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