

EneSolve Case Study

Multi-Site Hospital

The objective of this client engagement was to deliver substantial energy savings with a payback period of less than 5 years.

The method of delivery chosen was an Energy Performance Contract (EPC) which guaranteed the energy savings pursuant to the results of the Detailed Feasibility Study (DFS). Subject to achieving the guaranteed energy savings, additional savings were split 50/50 between the contractor and the client as a performance incentive.

The ability to guarantee projected savings is the critical difference between traditional consulting reports and the EPC. Such guarantees can only be given where the head contractor has the depth of skill and experience necessary to identify, qualify and implement the energy efficiency initiatives.

MEASURES IMPLEMENTED

There were a number of substantial measures implemented across a range of engineering disciplines. Major disciplines are highlighted below, together with point form summaries of the specific measures implemented in this case.

1. HVAC controls

- re-profiling of heating/cooling loads and improved correlation with outside air temperatures, to achieve greater use of outside air; improved outside air damper(s) controls
- re-profiling of temperature set-points and dead bands
- total review of air volumes and velocities to closer match Code requirements
- improved modulation of heating and cooling inputs at the supply end, to eliminate/significantly reduce "heating fighting cooling"
 - reprogramming of all mixing box controls
- Reconfiguration of temperature sensor infrastructure (locations especially) to improve supply/demand matching

2. Chiller(s) efficiency/optimization

- sequencing of chillers to better match chiller performance curves to cooling demand
- reset of chilled water temperatures
- installation of state of the art electronic controls (including to chilled water loop)
- revision of cooling towers controls (resulting in significant savings in both energy and water)

3. Boiler control/operation

- comprehensive review of demand
 - water efficiency measures implemented
- rationalization of supply infrastructure
 - some appliances de-commissioned
 - others fitted with upgraded controls
 - improvements to maintenance specs (combustion efficiency in particular)
- improved pumping (regularly found to be grossly oversized and single-speed)

4. Domestic hot water (DHW)

- Measures similar to Point 3 above.

5. Power factor (PF)

- analysis of PF at every DB
- PF units designed supplied and installed to deliver cost-effective outcome based on REVISED demand (due to above measures)

6. Lighting

- comprehensive survey of all lighting infrastructure using unique, cost effective methodology, down to per-fitting, per-circuit level
- retrofit strategy based on;
 - fitting types
 - functional requirements (note, wide range – operating theatres through to corridors)
- unique solutions developed for each application, down to special purpose/one off components (due to strong alliance with lighting manufacturers and scale of work throughput)

7. Hydronic Systems

- unique, bespoke application involving the modulation of controls for an old, constant flow system

There was also a specialized piece of work required for the major centralized kitchen. This incorporated the following measures.

1. Review of all appliances in terms of use, efficiency & control

- decommissioning of some appliances
- replacement of others
- new controls fitted to some
- revised maintenance specs written and implemented for all appliances

2. Review of HVAC infrastructure

- decommissioning of existing heating system
- total revision of ventilation/air handling plant
- application of radiant heating infrastructure where appropriate

RESULTS

As a result of all analyses and implementation, the final project results were:

Total Capital Expenditure:	\$1million
Annual Energy Savings (AES) Guarantee:	\$220,000 per annum
AES Guarantee - % of total energy consumption:	19%
Actual Energy Savings:	21%*
Payback Period:	App. 4.5 yrs
Performance Guarantee:	AES over 6 years.
Profit Share:	50/50 above AES Guarantee

*This project was commenced in 2002/3 and has consistently delivered savings above the AES guarantee. This result exemplified the value of an integrated approach to energy efficiency contracting which is the cornerstone principle of the EneSolve business model.