Project Knowledge – Cooling Plant Optimisation by University of Surrey

BEFORE:

- The Existing Stal Ammonia chiller served all three buildings, poor COP plant switching continuously
- 2,530,590 kWh consumed
- £265,712 /year running cost
- Poor plant reliability

AFTER:

- Project cost - £102,460
- Post- 2,316,750 kWh
- £22,453 /year savings
- Payback of 4.6 years
- 114 tCO_2 saved per year

[Project completion date – February 2011]

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Supporting Comments:

- The current Stal chiller has a measured COP of between 2.2 to 3.1 with a seasonal average around 2.4 The new plant will have a COP of between 5 & 6 at full load and as high as 7 to 9 at part load. We expect the seasonal average to be around 6.5, almost 3 times the current machine.
- To ensure our financial assessment is robust, we have reduced the seasonal COP to 5.1 and ignored the impact of the controls changes to effect free cooling and building pre-cooling.
- The building and process loads are considerable. We estimate the electricity use associated with cooling plant at around 16% (compared to normal levels of 9-12%).
- The total estimated cooling energy consumption is 404,894 kWh. With the new cooling plant the reduced consumption will be 191,054 kWh a reduction of 213,840 kWh or 52%
- We've applied a fuel cost (day rate) 10.5 p/kWh – over the life of the plant we should see significantly higher savings as fuel prices increase
- The manufacturer is Geoclima and the plant was supplied by KlimaTherm

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