



CHILLED WATER System Energy Survey

Quantify · Implement · Verify

 Telereal
Trillium


AVIVA

Case Study

Efficient Air Chilled Water Survey reduces AVIVA's annual cooling energy down by 10% from 5.3 MWh and quantified further potential savings of 17%

PROJECT -

Chilled water system, resilience and energy optimisation, at their HQ in York

CLIENT -

Building Owner:

TelerealTrillium, one of the UKs largest property companies

Building user:

AVIVA the UKs largest insurance group

PHASE 1 - Actual Results

- **Resilience** – From tripping out at 27°C to operation >36°C
- **531,300** kWh annual energy reduction
- **£47,800** annual energy saving
- **£3,504** annual CRC tax reduction
- **15** month payback
- **292** Tonnes of CO₂ annual reduction

PHASE 2 - Predicted Results

- **770,740** kWh annual energy reduction
- **£61,659** annual energy saving
- **£5,088** annual CRC tax reduction
- **24** month payback
- **424** Tonnes of CO₂ annual reduction

RECOMMENDATION

"My gratitude goes to Steven Biggs and the team at Efficient Air for their efforts during the upgrade work at Wellington Row in York. This was a particularly challenging project for a whole number of reasons and I am impressed with the manner that the team handled all the problems we encountered at design/cost stage and during the work."

Arthur Portelli, CEng FIET FCIBSE, Assistant Technical Director, Telereal Trillium

THE BRIEF

Efficient Air were to take a holistic approach to analyse the whole chilled water system. The report was to determine why the system fails at ambient temperatures of 27°C and above. Benchmark current performance against manufacturers data and building load and design a high efficiency upgrade to elevate current capacity with improved part and full load efficiency. To quantify the annual savings against implementation costs to show potential return on investment. Then project plan an instal against a tight deadline, outside normal working hours and with the minimum of disruption.

AVIVA / TelerealTrillium | Case Study | April 2011

THE APPROACH

Working with the facilities manager, building owner, and tenants, Efficient Air set about the challenge by assessing the current performance of chillers and condensers using their specialist **ChillerCheck** on site analyser to trouble-shoot the refrigeration circuits of the chillers, the focus was then placed on the design, technology and suitability of all line components within the chilled water system.



WHAT WE FOUND

PHASE 1 - Implemented and verified

Issues identified and rectified were,

- Chillers low on refrigerant charge
- Filter driers and elastomeric seals not replaced when R22 refrigerant has been replaced with non ozone depleting alternatives
- The system was originally designed to work at lower ambient temperatures than encountered in today's climate
- Lower efficiency "glide properties" of R22 replacement refrigerant were found
- Short circuiting of condenser exhaust air onto adjacent condensers
- Head pressure control
- The flat bed fans were low efficiency, single speed and not controlled in parallel

PHASE 2 - Quantified for Implementation

Issues identified for rectification are,

- Change belt driven fixed speed pumps to inverter controlled directly drive technology
- Commission a variable chilled water flow control strategy
- Reduce the percentage of glycol within the system to increase heat exchange efficiency
- Install free cooling LPA circuit to chillers to benefit from low ambient free cooling periods
- Rectify faulty fan coil unit control valves which are letting by



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For further details on our **Chiller Check** System Energy Survey, please contact:

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