



DATA CENTRE COOLING OPTIMISATION

Quantify · Implement · Verify

colt

smarter / faster / further

CLIENT -

Colt Technology Services -

Europe's leading
information delivery
service

PROJECT -

Energy and carbon reduction
at two of Colt's London data
centres



Case Study

PHASE 1 - Results

- **44%** contribution to Colt's corporate PUE 10% objective for 2010
- **9%** average savings on the data centre cooling load
- **9%** saving on non-IT overall site loads
- **64%** saving on air delivery plant load
- Fan savings ranging from **56% (min)** to **86% (max)**
- **36%** increase in redundancy (from n+1 to n+3)
- **14 month payback**
- **32%** air pressure delivery capacity increase (average)

PHASE 2

to carry out floor pressure improvements offers further savings
with **11 month payback periods**

RECOMMENDATION

"Efficient Air has brought a new dimension to our data centre energy saving programme. By going beyond the conventional boundaries they have enabled us to achieve excellent results. They have acted professionally and delivered everything that was promised at the outset, and more. We were able to form a close working relationship, and I am grateful for their support throughout the project." **Alistair Farndale, Chief Engineer, Colt Data Centre Services**

THE BRIEF

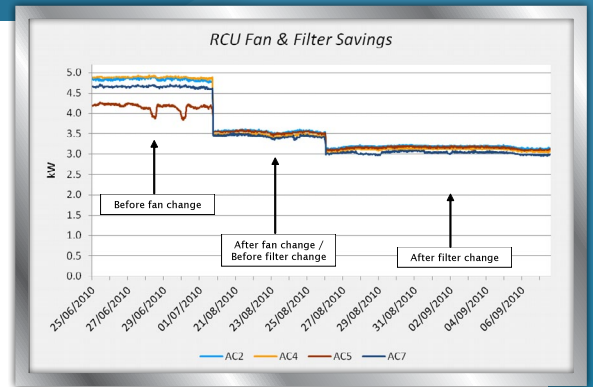
The data centre infrastructure services division of Colt accepted that the energy efficiency at its legacy data centres needed to not only meet best practice standards, but be upgraded to better energy efficiency and reduced CO₂ emission as well as prepare for the organisations inevitable scalability. Efficient Air was given the challenging task of showing how this could be achieved and optimised through a series of phases at both data centres.

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THE APPROACH

Efficient Air was able to apply its newly launched data centre service called 'Sphere', a service specifically designed to optimise existing data centres. Sphere's key fundamental is based on the holistic principle, looking at how each of the constituent parts of the cooling infrastructure, supporting the IT, interact as a whole system. A full Sphere survey might typically include a comprehensive analysis of the chillers, the heat rejection plant, and of the delivery of cooling to racks themselves. Once potential savings have been identified and quantified, Efficient Air would then proceed with a planned implementation strategy for all or some of the initiatives. Finally, verification of the savings is undertaken via 'ring-fenced' monitoring of the equipment, available to the client over a secure portal.

One of the key components to Efficient Air's success is to be able to work with the client and their key business partners, to build a relationship on trust, with the shared goal of making an existing data centre operate as efficiently as possible. This requires an understanding of the client's needs, in respect of return on investment, and carbon reduction objectives.

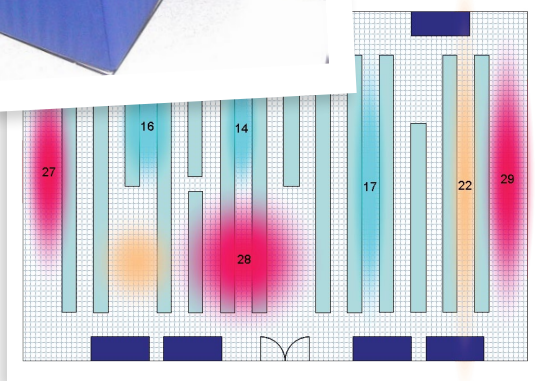


WHAT WE FOUND

The analysis took the form of measurements of air volume and static pressure both at CRAC level and grille level and of chilled water flow rates and temperatures. All analysis used real-time data rather than simulation, allowing for informed decision making, rather than decision making on a best guess principle. This analysis showed that not only could the existing cooling units benefit from new component technology (see post installation monitoring graph above), but the delivery of cooling from CRAC unit to grille, via the floor void, gave a lot of scope for improvement.

A grille's location and air velocity (or throw) is critical, so each terminal was systematically measured using a Balometer (as pictured). Bypass, often overlooked was found to be excessive in some suites, leading to low floor void pressure, in turn resulting in undesirable hotspots. In contrast some aisles had excessive floor grilles leading to coldspots (as illustrated).

Following the improvements made to the floor void integrity, the floor void pressure control (installed by Efficient Air) was enabled and fully commissioned inclusive of fault testing. The pressure control system for each suite delivered a 0-10 Volt control signal to the respective CRAC unit fans against a desired setpoint, this also provided improved redundancy when compared with the original setup. The entire installation was then verified once again and summarised in a series of commissioning reports and site reviews which also gave recommendations for future improvement works.



Generic floor plan

FURTHER BENEFITS

Further benefits were achieved including:

- A control strategy that integrated fail-safe modes and a manual override
- Reduced maintenance and increased resilience due to new equipment, less fans and the elimination of belt drive transmissions
- Better air flow over the CRAC unit heat exchangers, reducing dead spots, leading to increased chiller efficiency
- Non-overloading fan characteristics
- More energy efficient filter specification, presenting lower resistance at reduced capital cost for replacement



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For further details on our **SPHERE** legacy data centre cooling optimising, please contact:

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