

# Optimising Data Centre Infrastructure



# Wasted Energy within UK Data Centre Industry

Current Total Energy Consumption

\*14 Tera Watt Hours

Estimated Energy Saving

5.6 Tera Watt Hours

Potential Energy Consumption

8.4 Tera Watt Hours



Average PUE 1.8

Reduction PUE 0.6

Potential PUE 1.2

\* Assumes UK is approx. 25% of EU Data Centre power consumption. It is also estimated that total data centre power consumed will grown to over 21 Tera Watt Hours by 2020.

## OPTIMISING DATA CENTRE INFRASTRUCTURE

The average PUE within UK data centre infrastructure is conservatively estimated at 1.8. This PUE presents a relatively low efficiency level and offers many data centre operators the opportunity to make significant energy savings through intelligent optimisation.



# Why Is Data Centre Energy Performance Poor ?

Whilst of course not all data centres are under performing it is a fact that the average real operational PUE across UK data centres is  $>1.8$ . This represents an effective efficiency of only 55%.

**It is unlikely that any business would willingly allow parts of their operation to run at 55% efficiency levels!**

## SOME REASONS FOR UNDER PERFORMANCE

### Age Related

Ageing plant & equipment delivering poor energy efficiency ratios compared to modern equivalents

Legacy data centre environment

Unplanned development over a period of time leading to poor airflow efficiency.

### Design Related

The data centre was not originally a purpose built facility

Built by non data centre specialists and unable to cope with contemporary I.T loads

IT load not meeting original design expectations leading to over provisioning

### Operations Related

Lack of maintenance

Slow to adopt modern data centre operational practices

Primary focus is on managing ICT equipment

Limited data centre infrastructure expertise within I.T team

## Three Simple Steps

A simple three step process makes it very easy to implement an effective optimisation plan.

1

### Data Centre Audit

During the initial phase a data centre audit will be undertaken in order to identify key areas of improvement within the current arrangements. The audit report will highlight a range of recommendations detailing the predicted impacts they will have on the overall data centre performance.



2

### Implement Audit Recommendations

The implementation of the audit recommendations is the first step to making meaningful improvements to the data centre energy performance.



3

### Optimisation Services

Data Centre Energy Optimisation services are designed to address data centre imbalances by fine tuning system settings and configuration arrangements with the aim of achieving optimum energy performance.



## POTENTIAL ENERGY SAVINGS

Per 100kW of I.T load the average energy saving is in the region of 60kW\* which equates to a revenue saving of £52K per year

\* Assumes a PUE of 1.8 is reduced to 1.2. Whilst it is difficult to predict actual savings for individual data centres the initial investment of an Audit service is typically less than £2000 (EX VAT).

## Step 1 – Data Centre Audit

A simple three step process makes it very easy to implement an effective optimisation plan.



### Comprehensive Data Centre Review

**1** The audit takes the form of a non-intrusive data centre “MOT” designed to identify both good and bad practices throughout the facility. Audits are aligned with EU Code of Conduct Best Practice Guidelines, TIA 942 Standards and Green Grid & ASHRAE recommendations.

### Audit Details

**2** The audit will inspect a wide range of aspects of the facility with a particular focus around cooling, airflow and power efficiency. The audit will also review general housekeeping, maintenance and documentation systems.

### Produce Guidance & Recommendations

**3** Their output of the audit is a set of recommendations detailing the impact on the data centre performance. These are listed in order of priority with costs vs. estimated payback.

**“Workspace Technology identified a number of energy saving opportunities for SRS. Following their implementation the predicted energy savings of £2K per month was observed. SRS were very pleased with the results.”**

John Price  
Shared Resource  
Services

### EASY TO UNDERSTAND REPORTS

Data Centre operators are able to assess the range of recommendations and make decisions based on simple facts. The Audit report will enable the operator to focus investment where the best energy efficiency improvements can be made.

## Step 2 – Implementation of Audit Recommendations



### Planning

1 Data Centres are mission critical environments, all works should be carefully planned and scheduled to ensure minimum risk and ideally no interruption to service.

Existing Total Facility Power and PUE should be measured in order to benchmark results.

### Implementation

2 Experienced data centre engineers will implement the agreed works in-line with the programme. Following each phase the data centre should be checked to ensure the environmental conditions are stable and the facility is operating correctly.

### Performance Verification

3 Following the implementation of audit recommendations power usage and PUE performance should be re-assessed to verify results against the original benchmark.

**“The PUE of 1.15 produced by Workspace Technology’s team was exceptional. This compared to our original PUE 2.5 and delivered an yearly operational saving to the Council of over £150K.”**

Ian College  
Leicester City Council

## MEASURABLE SAVINGS

By implementing audit recommendations data centre operators are able to realise potential energy savings. Depending on the extent of the works' payback periods typically range from 6 months to 5 years.

## Step 3 – Optimisation Services

1

### Improving System Operation

Data Centre Optimisation Services are designed to address data centre imbalances by fine tuning system settings and configuration arrangements with the aim of achieving optimum energy performance.



2

### Cooling & Electrical Optimisation

Specialist cooling and data centre engineers will undertake careful fine tuning of a range of system settings including speeds, temperatures, set points & modes of operation in order to balance the system and deliver optimum performance.

3

### Optimisation Report

On completion a summary report of actions will document improvements in PUE performance or energy reduction and identify any additional corrective actions or recommendations.

**“One of the best investments our organisation has made. The implementation of audit recommendations resulted in an immediate 50kW energy reduction”**

Peter Robinson  
Humberside Police

## ONGOING DATA CENTRE OPTIMISATION & BALANCING

Optimisation services can be implemented on a stand-alone basis without the need for a Pre-Audit, this will depend on the age and condition of the data centre. Optimisation should be undertaken on a regular basis or when major IT load changes occur to ensure that data centre systems are operating at optimum performance.

## Flexible Approach

Workspace Technology offers a flexible approach to data centre optimisation services. Simply choose the model which works best for your organisation, this may include any or all of the three recommended optimisation steps.

**“Following of a two day optimisation engagement we realised an immediate and lasting reduction in Total Facility Power of over 20kW”**

Matthew Stringer  
Host Europe Group

## OPTIMISATION SERVICE OUTCOMES

Improved Airflow  
Efficiency eliminating  
short cycling of cold air

Application of Best  
Practice Data Centre  
Design Principles

Optimisation of  
Environmental  
Conditions

Identification &  
replacement or  
upgrade of poor  
performing plant

Re-balancing of power  
infrastructure

Identification of “sweet  
spot” operational  
settings in order to  
match the prevailing  
I.T load

Reduced operational  
data centre risk

Reduction in Total  
Facility Power and  
improved PUE

Ability to divert power  
resources to I.T  
services

Avoid the potential  
requirement to  
upgrade power  
infrastructure

## WHO WILL BENEFIT

Data Centre operators that face increasing energy bills will benefit from optimisation services. Data Centres with issues ranging from legacy infrastructure, I.T loads falling short of design capacity, recent changes in I.T load profile and where there has been limited focus on energy efficiency over the past few years will all benefit from the optimisation service.

## Why Workspace Technology

Workspace Technology is dedicated to delivering industry-leading service, support & optimisation for organisations across the UK. We draw on our significant knowledge and expertise of mission critical & data centre environments, technology and operations in order to provide a collaborative approach to service and support throughout the lifetime of your infrastructure.

We are a data centre specialist with over 11 years of practical experience

We directly employ skilled data centre centric mechanical and electrical engineers

We have practical hands on experience of resolving a wide range of data centre issues

Energy efficiency is ingrained into our data centre design, build & management philosophy

We operate our own colocation data centre and therefore share the same experiences as our clients

Workspace Technology's track record of success is second to none

Workspace Technology have contributed to a combined energy reduction of over 3MW over the last 5 years

We have produced a £2.6m ongoing annual operational saving for organisations across the UK

**“The audit undertaken by Workspace Technology quickly identified meaningful and verifiable savings of in excess of £90K per year for the Council”**

Paul Rossiter  
Caerphilly County  
Borough Council

### WHAT TO DO NEXT

Contact Workspace Technology's team who will be more than happy to discuss and evaluate your individual concerns and requirements. We can then provide a recommended course of action.

# Data Centre Optimisation Services



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