



Innovation please!

A 15.8 million kW-h reduction in annual power consumption
Initial results confirm a Power Usage Effectiveness (PUE) of 1.2
A 6.8 million kg reduction in annual CO₂ emissions

overview

➔ Leading oil exploration surveyor Petroleum Geo-Services (PGS) data centre required a high performance data centre solution at the company's regional office in Weybridge, Surrey that would significantly reduce power usage to achieve considerable cost savings and reduced carbon footprint. Keysource was appointed to design, build, install and manage the facility following a competitive tender.

PGS offers a broad range of products to the oil industry including; seismic and electromagnetic services, data acquisition, processing, reservoir analysis/interpretation and multi-client library data. The company helps oil companies to find oil and gas reserves worldwide, offshore and onshore.

the challenge

➔ PGS uses vast amounts of data that is vital to the success of its business, so needed a solution that would provide safe and sufficient storage and allow deployment of high-density HPC hardware. The company also recognised the high financial and environmental cost attached to operating a data centre and wanted to look at innovative new approaches to drive down energy usage.

data centre: · consult · design · deliver · manage



the solution



The data centre is the first facility to adopt Keysource's **ecofris** technology, an innovative new approach to cooling that can reduce the energy cost of operating data centres by more than 45 per cent and is the most efficient option currently available in the UK. The facility has been designed for 1.8MW of IT load and can accommodate high-density HPC hardware at any rack position with rack power densities of 30kW comfortably supported, easily accommodating 15kW per rack specified by the PGS IT team.

Initial results confirm that the data centre has achieved a Power Usage Effectiveness (PUE) ratio – an energy calculation recommended by industry sponsored organisation Green Grid – of 1.2 compared to a typical UK figure for a conventionally designed data centre of 2.2. Therefore, at full IT load and compared to their previous site the **ecofris** cooling solution will reduce annual power consumption by 15.8 million kW-h and reduce emissions by 6.8 million kg of CO₂ per year (Based on UK grid average). Furthermore, the facility has a Data Centre infrastructure Efficiency (DCiE) figure of 83.3%, where 83.3% of the total power being consumed by the facility is powering the IT equipment.

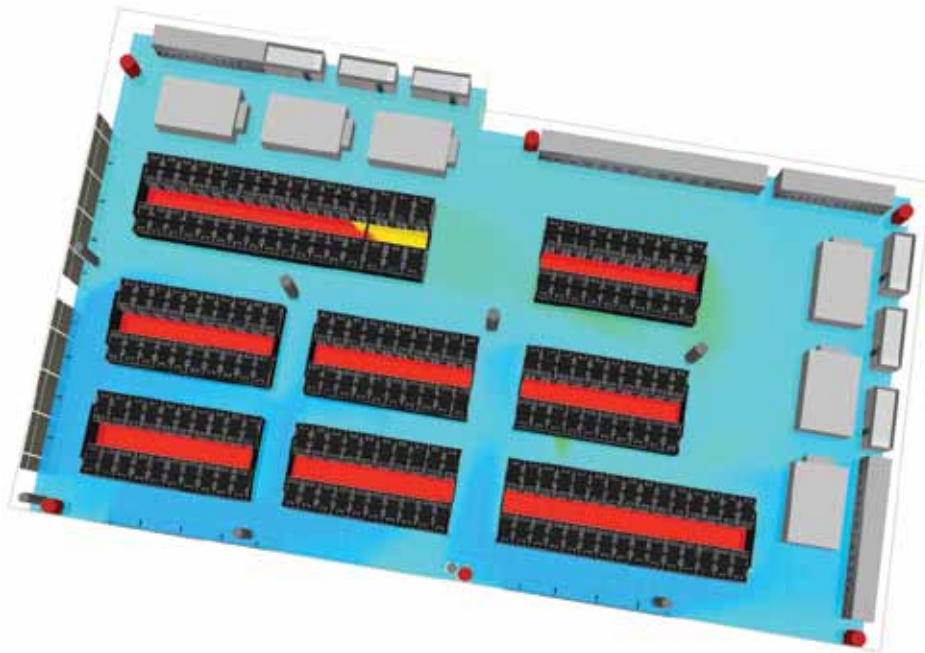
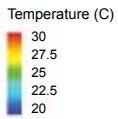
Keysource completed the detailed design for the facility including a new mains supply transformer, N+1 power and cooling solutions as well as supporting protection systems. A modular approach has been utilised to ensure seamless upgrade from the 600kW phase 1 IT load through to full deployment.

Central to the design process, and key to the new concept, was the use of Computational Fluid Dynamics (CFD) software to model the data centre airflow. Keysource's in-house experts have used CFD modelling extensively in the development of the **ecofris** cooling solution to ensure that the rack layout and server airflow requirements are optimally matched with the air handling equipment to maximise efficiency and assure the environmental conditions are maintained under all scenarios.

The data centre build was managed by the Keysource's project management team which delivered the project on-time and within budget, handing over the facility with server racks powered up and all network cabling in place to allow the PGS HPC team to concentrate on populating the racks with the servers.

During the closing stages of construction comprehensive system testing was carried out to verify that the facility operated within the design parameters, with Keysource's Facility Management team taking a strong hand in the final system commissioning to make sure they had a comprehensive understanding of the new systems they will be maintaining, and simulating all conceivable scenarios to make sure all the plant and equipment will work reliably, as one system, once in operation.

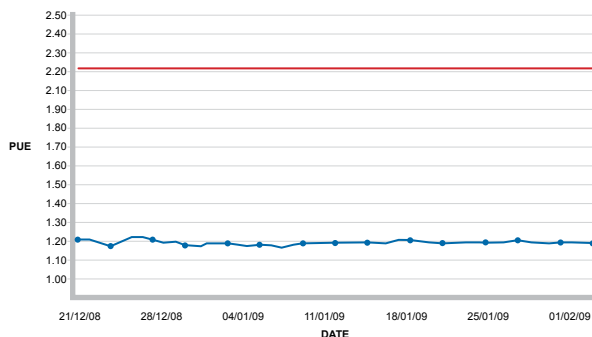
case study: **Petroleum Geo-Services**



A CFD image depicting the air temperatures at full deployment

A comprehensive management and monitoring solution has been installed to alert the Keysource Facility Management team directly in the event of any system alarms. The system brings all the data centre plant and equipment together in one view to simplify ongoing management of the space. This provides high level management reports to track the capacity and performance of the facility, with PUE constantly recorded and reported as one of the Key Performance Indicators.

Mike Turff, Global Data Centre Manager at Petroleum Geo-Services says: **“We are committed to reducing energy, but we also needed to ensure that any data centre design would allow deployment of our high-density server and storage hardware. The safe and efficient storage of vast amounts of vital data is key to the success of our business, however we are also highly committed to a strong environmental stance. The Keysource ecofrís solution provides us with a resilient and future proof answer without compromising our core values.”**



Monitoring & reporting:
PUE graph from ISX Central

- Average UK Data Centre PUE
- PGS PUE



the benefits

- ➔ **Increased Performance** – PUE measurement as low as 1.2 and a DCiE of 83.3%, where 83.3% of total power being consumed by the facility is powering the IT equipment. This is significantly below a conventionally designed data centre that typically has a PUE of 2.2 and a DCiE of 45.5%
- **Energy Efficiency** – projected savings in annual power consumption of 15.8 million kW-h and a reduction in emissions of 6.8 million kg of CO₂ per year (full deployment)
- **High Density** – Can comfortably support high density hardware platforms of 30kW per rack and above
- **Project Management** – an end-to-end solution with highly-responsive client service and project management meant the data centre was completed on-budget and on-time
- **Partnership Approach** – Keysource's unique consultancy approach resulted in a bespoke data centre solution that met the precise needs of PGS

can we help you and your company?

- ➔ If you feel you could benefit from Keysource's innovative data centre design and build services, please get in touch...

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Mike West, Managing Director of Keysource says:

“This facility can legitimately be described as ‘the first next generation data centre’ anywhere in the world. The Ecofris cooling solution is an overall cooling strategy that is the result of 18 months hard work to design the most efficient data centre that not only reduces energy but works with modern high-density IT hardware platforms to multiply energy savings”

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