



Data Centre Sustainability  
Project of the Year



**WINNER**

Low Carbon Industrial  
Project of the Year



Most Sustainable Data Centre  
Project of the Year



## Case Study



# Securing over £1m data centre cooling energy saving for Virgin Media O2

To help deliver against its sustainability and net zero targets, Virgin Media O2 is optimising the performance of its data centre and core network sites with the most advanced, AI-powered optimisation software.



## The EkkoSense® Effect

**15%**  
Energy saving  
across 20 sites

**£1M+**  
Annualised  
saving

**760**  
Equivalent CO<sub>2</sub>  
saved per year



## This case study sets out how Virgin Media O2's data centre team took advantage of EkkoSense's powerful AI-powered data centre cooling optimisation software to secure cooling energy savings worth in excess of £1 million per year – equivalent to 760 tonnes of carbon dioxide using location-based scope 2 accounting.

### Introduction

Virgin Media O2 launched on 1 June 2021, combining the UK's largest and most reliable mobile network with a fully gigabit broadband network.

Its fixed network covers more than half of the country (17.2m homes serviceable) alongside a mobile network that covers 99% of the nation's population.

As the company connects millions of customers every day and is expanding its network to more places across the country, sustainability is at the core of Virgin Media O2's operations so it minimises its impact on the planet.

As part of this, Virgin Media O2 is committed to reducing its energy usage and becoming more energy efficient, and by sourcing renewable energy. It's a key element of its sustainability strategy, the Better Connections Plan, where Virgin Media O2 is also working to achieve net zero carbon emissions across Scopes 1, 2 and 3 by the end of 2040.

### Innovation at the heart of Virgin Media O2's operations

Innovation sits at the heart of everything that Virgin Media O2 does, and the company is investing billions into its infrastructure expansion and upgrades as it rolls out its next generation 5G mobile and fibre networks. This invariably involves a greater workload demand on the company's network of data centres, and places an increased focus on ensuring that Virgin Media O2 data centres are operating as efficiently as possible. However, delivering increased workload throughput, while also ensuring risk reduction and improved sustainability, is often challenging.

To help address this, Virgin Media O2's Technical Site Engineering and Delivery team works consistently to optimise their data centres' energy performance and help unlock additional energy and efficiency improvements. And with electricity prices rising dramatically over the previous year, it was important to focus on securing data centre energy efficiencies that could potentially help to mitigate rising data centre energy costs.

"It can be difficult to unlock the kind of performance improvements that we were looking to achieve – handling greater workloads while also securing energy savings – unless you know exactly what's happening in your data centre in real-time," explained Adrian Lazenby, Virgin Media O2's Head of Technical Site Engineering and Delivery. "The good news is that all the data is out there, ready to be collected – operations teams just need to capture it."

### Virgin Media O2 to make the invisible visible with EkkoSense

That's why Virgin Media O2 engaged EkkoSense, the AI-powered data centre optimisation software specialist, to help its operations teams gain a real-time view of their thermal, power and capacity performance across 20 key Virgin Media O2 UK data centre sites. Unlike traditional, IT-led DCIM-based approaches, EkkoSense offers a distinctive, light-touch AI-enabled software-driven thermal, power and capacity optimisation solution. This enables operations teams to optimise data centre performance while simultaneously delivering quantifiable sustainability results.

The solution brings together an exclusive mix of technology and capabilities. Low-cost Internet of Things (IoT) sensors provide the innovative SaaS platform with valuable data and, using machine learning, provides AI analytics, gaming-class 3D visualisation and Digital Twin capabilities. The technology is backed by embedded advisory support including EkkoSense's PhD-level thermal and engineering experts and deep rooted sector expertise.

Unrivalled levels of granular data centre sensing provides the core machine learning data that enables true real-time visibility of cooling, power and capacity performance. From a thermal management perspective, it's a lot easier to identify potential cooling issues quickly by using comprehensive 3D digital twin visualisations that allow information to be monitored and interpreted quickly.

According to Adrian: "this lets our team see exactly what's happening in data centres across our business. The 3D visualisation particularly helps in terms of highlighting potential anomalies and displaying suggested airflow and cooling improvements."

The deployment of Internet of Things-enabled sensors enables Virgin Media O2's team to see how its sites are performing in real-time. Attaching thermal sensors on all racks and cooling systems allows the capture of more granular and continuous thermal data to feed into the EkkoSense software. Unique EkkoAir Wireless cooling duty sensors also provide real-time tracking of cooling duty loads in kWc for any CRAC/AHU unit.

With the EkkoSense software collecting thousands of data points every five minutes, the millions of data points already collected contribute directly to the effectiveness of machine learning algorithms. "Having access to this volume of real-time insight allows our operations team to see how Virgin Media O2's data centres are performing from a cooling, power and capacity perspective, while also enabling us to identify further energy optimisation opportunities in terms of cooling energy usage and overall savings," added Adrian.



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### Doing in seconds what would have taken weeks before

Artificial intelligence and machine learning at this level scales up the optimisation opportunity for Virgin Media O2, taking all those complex data centre datasets and crunching the numbers, doing in seconds what people would have taken weeks before to achieve. Examples of EkkoSense optimisation functionality here include:

- Identifying data centre hot/cold spots, and rebalancing airflow to match loads before modifying setpoints.
- Identifying free air under-utilisation to increase the free air window.
- Identifying the most efficient cooling units.
- Highlighting cooling faults that, in turn, create reliance on inefficient cooling.

“With EkkoSense’s EkkoSoft Critical monitoring, visualisation and analytics tool in place, Virgin Media O2 now benefits from fully correlated real-time data that’s presented in a distinctive, actionable way,” explained Adrian.

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Key EkkoSense innovations that distinguish the company’s software-based optimisation approach from more traditional legacy DCIM approaches include:

- **The application of machine learning analytics built right into the heart of EkkoSoft Critical** – based on PhD-level thermal expertise, data from 50m+ data points in critical facilities around the world, as well as real-time inputs from sensors deployed across an organisation’s entire estate – from Edge facilities through to the largest enterprise sites
- **Unique Cooling Advisor functionality that provides continuous tangible optimisation recommendations to deliver cooling energy savings up to 30%** – your own virtual PhD expert continually optimising your facility, and always on hand to help in-house data centre teams to deliver the next best optimisation outcome
- **The application of EkkoSense’s distinctive Cooling Zones capability that shows the real-time correlation between cooling units and IT racks to support optimisation and provide very effective redundancy and resilience testing** – providing organisations with a much higher degree of confidence in the ongoing resiliency of their cooling plant
- **A lightweight and easy-to-manage M&E Capacity management capability** – meaning that you no longer need an army of people or huge costs to deliver an effective centralised capacity management process
- **Use of the latest web technologies** – including gaming interfaces to provide data centre teams with the most intuitive, easy-to-use and simplest to manage monitoring and management capabilities. By creating immersive Digital Twin representations of your data centre, operations teams get to see all their current cooling, power and thermal conditions via a single, accessible 3D visualisation
- **Truly granular levels of sensing** – taking advantage of EkkoSense’s latest low-cost IoT wireless sensor technology to allow sensors to be deployed in higher numbers across the data centre right down to rack-level – making true machine learning-based analytics and real-time thermal management of critical facilities a reality. This is typically complemented by our EkkoAir vendor-agnostic cooling unit smart meter that provides real-time cooling duty information, highlights unperforming units and helps predict potential failure points before they happen

**The result is EkkoSoft Critical - an immersive, intuitive and effective M&E software platform that helps customers such as Virgin Media O2 to:**

- Become fully ASHRAE-compliant and remove thermal risk
- Identify unused cooling capacity and unlock potential capacity increases
- Directly support their green agenda & reduce carbon footprint in the quest for net zero
- Gain real-time monitoring insights from anywhere with full remote visibility
- Optimise cooling and gain energy savings
- Plan, predict and model M&E capital spending with confidence

## Translating data into energy savings for Virgin Media O2

Virgin Media O2 was keen to get the optimisation process rolling, and tasked EkkoSense with optimising the cooling performance of 20 of its UK data centres. “We were particularly keen to secure reductions in our data centre cooling energy usage, so set a demanding timeframe for the project,” recalled Adrian.

Installing sensors, deploying the EkkoSoft Critical software and optimising thermal performance took an average two weeks per Virgin Media O2 data centre site. The EkkoSense team optimised the cooling performance of the 20 Virgin Media O2 sites in just six months, helping accelerate the time to savings.

Key benefits for the project to date have included securing an initial cooling energy saving across the 20 sites that’s equivalent to annual savings in excess of £1 million per year. This represents an average . The Virgin Media O2 data centre operations team’s energy saving is equivalent to 760 tonnes of carbon dioxide using location-based scope 2 accounting.

At the same time, the project has also resulted in improved performance for Virgin Media O2’s significant investment in free air cooling devices by maximising free air capacity. Where possible, reducing maximum rack temperatures has also helped to resolve potential thermal risks associated with hot spots – indeed thermal optimisation across the 20 sites has increased thermal resilience and improved cooling capacity.

EkkoSense’s EkkoSoft Critical optimisation is also unique in that it provides organisations such as Virgin Media O2 with an embedded AI-powered Cooling Advisory tool that not only provides real-time insight and optimisation advice, but also helps operations teams to ensure that their data centre estate remains fully optimised.

## Next steps for Virgin Media O2

Virgin Media O2 can take advantage of the powerful ESG Reporting capabilities now available within the latest EkkoSoft Critical software release. The company’s data centre operations team can also access comprehensive global estate dashboard visualisation that provide a clear consistent view of Virgin Media O2’s digitised data centre estate – offering a consolidated view of capacity, power and thermal performance management across monitored sites.

“The good news for Virgin Media O2 is that EkkoSense continues to add value to its AI-powered 3D visualisation and analytics software solution,” said Adrian. “That’s continuing with innovations such as Cooling Anomaly Detection that will help us to identify machinal and electrical equipment performance anomalies before potential failures – and we’re looking forward to further functionality as the software continues its development.”

## EkkoSense Deployment

- Deployed across 20 Virgin Media O2 UK data centre sites
- Demanding timeframe as Virgin Media O2 keen to secure reductions in cooling energy usage

## EkkoSense Deliverables

- EkkoSensor wireless sensors across target Virgin Media O2 sites
- EkkoSoft Critical AI-powered 3D visualisation and analytics software
- EkkoAir wireless cooling duty sensors
- Data Centre Performance Optimisation Managed Service

## Benefits Achieved

- Cooling energy savings secured
- Reduction in carbon emissions
- Removal of thermal risk
- Platform now in place for roll-out to further Virgin Media O2 data centre sites

## ROI

- EkkoSense cooling optimisation delivered in just six months – accelerating time to savings
- Cooling energy annual savings in excess of £1 million per year, equivalent to 760 tonnes of carbon dioxide using location-based scope 2 accounting
- Average 15% saving in data centre cooling across target sites



Bring the power of EkkoSense AI to your critical facilities



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Request your free demonstration and experience the future of data center optimization, today.

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