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OPTIMISING INTERNATIONAL DATA CENTRES

BACKGROUND

When assessing the efficiency of a data centre, the energy used to power it is an important consideration. The cost and carbon mix of energy varies significantly around the world, so using country-specific market information is vital to maximise the accuracy and impact of the analysis.

This was a core component of our work with a data centre in China in 2021. Our goal was to optimise its server estate for cost, carbon, and energy via vendor-neutral hardware suggestions. Interact can be tailored to different market conditions, so these calculations factored in China's lower energy costs and higher carbon mix.

HOW DID WE HELP?

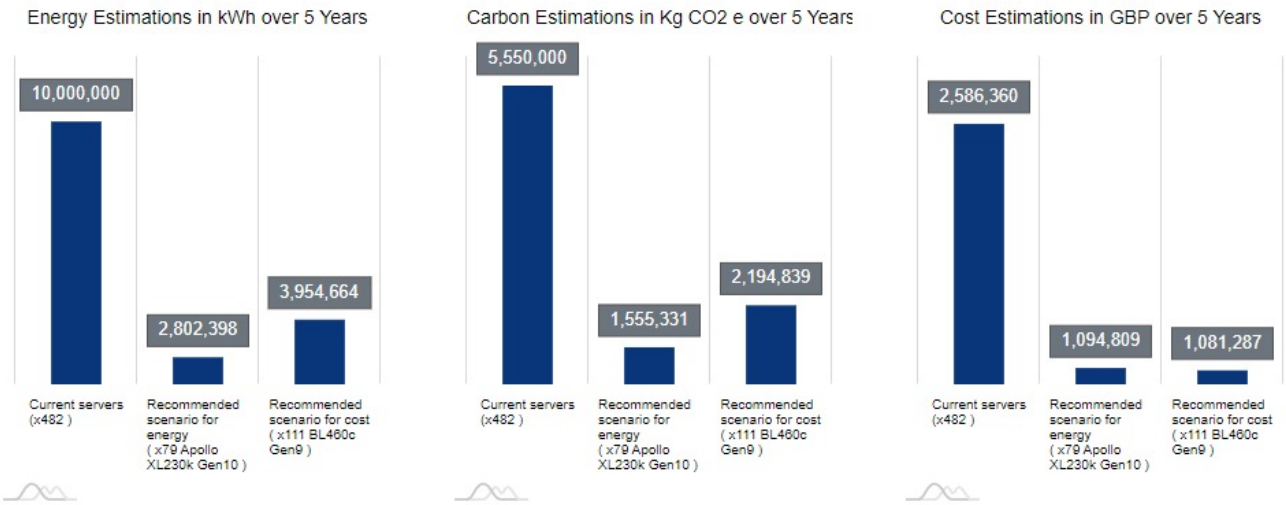
We used the Interact tool to analyse the performance of the data centre's 482 servers. We found that all servers were of a similar age and configuration. Moreover, they were all manufactured in 2012, three years before the slowdown in Moore's Law was shown in CPU trends. This meant it would be possible to replace the whole estate with more efficient newer generation machines.

WHAT WAS THE IMPACT?

Our analysis produced two sets of recommendations. The first maximises energy savings, while the other optimises for cost. The projected impacts of these two options are summarised below.

	Energy saving recommendation	Cost saving recommendation
Servers required (compared to original 482)	79	111
Energy saving	7,197,602 kWh	6,045,336 kWh
Emissions from energy (Scope 2)	3,994,669 kg CO2e	3,355,161 kg CO2e
Supply chain emissions (scope 3)	72,838 kg CO2e	102,342 kg CO2e
Cost saving	£1,052,376 GBP	£1,136,204 GBP

Summary of Recommended Server Refresh Scenarios:



To maximise energy savings, our analysis found that refreshing to the latest generation Apollo server would reduce the number of required servers by 83% to just 79. There are several major benefits to this. Operationally, it will reduce space requirements and cut both cooling and maintenance costs. Additionally, this server model is available on the secondary market, so a further 72,838 kg CO2e of embodied emissions could be saved by opting for refurbished instead of new.

To maximise savings, a Gen9 HPE server model was suggested. While this option would require 32 more servers than the energy optimised alternative, these earlier-generation HPE models are significantly cheaper than the Gen10 Apollos, which would reduce the overall refresh cost. Once again, these servers are available on the secondary market, which means over a tonne of embodied CO2e could once again by avoided.

To demonstrate the impact of country-specific market information, we ran the same analysis on an identical UK-based data centre. Looking at the energy saving recommendations, there would be 42% more cost reductions in the UK but just under 50% less CO2e savings over five years. Such variation would have a huge influence on any purchasing decisions.

The ability to make these accurate calculations is great news for those who run data centres in multiple locations and are trying to find the biggest area of impact. As carbon footprints become increasingly embedded into company reports (see our blog on why Carbon is Core Business), it is vital that today's data centre managers are able to bal-ance both accurately across their global estates.	**China**	**UK**
Emissions from energy (Scope 2)	3,994,669 kg CO2e	1,842,586 kg CO2e
Cost saving	£1,052,376 GBP	£1,491,551 GBP

To find out what we can achieve for you **contact us**.

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