Data Centre and Virtualization

How the Builders of the Digital Infrastructure can help tackle Climate Change

David Watkins

Biography

*David Watkins heads up the Solutions Team at VIRTUS (*https://virtusdatacentres.com/*), working with customers to provide customized solutions. He has been at VIRTUS since 2009, where he was previously head of operations. Before VIRTUS, David was head of UKMEA data centres at Unisys.*

Part of ST Telemedia Global Data Centres Group, VIRTUS Data Centres is London's leading data centre company and owns, designs, builds and operates the country's most efficient and flexible data centres. Located in and around London's metro, VIRTUS Data Centres leads the industry with award winning innovation in hyper efficient, ultra-high density and highly interconnected facilities which are designed specifically to offer the flexibility modern users need https://virtus.green/.

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Abstract
The continued growth of the global data centre market is being driven by an explosion of cloud and internet services. While from a business perspective, growth and expansion arguably represent success, in a data centre context, this exponential growth in data traffic comes at the cost of significantly higher energy demands explains the author of this article.

Introduction

Swedish researcher Anders Andrae predicts[1] that by 2025, data centres will amount to ICT's largest share of global electricity production at 33%, followed by smartphones (15%) networks (10%) and TV (9%). Andrae expects data centres to use 20% of the world's energy by this point too, placing their carbon footprint at 5.5% of the global value – above that of some other notoriously power-hungry sectors.

Given these alarming statistics, the impetus to "green" the data centre industry is significant. Data centre providers are under pressure to reduce their environmental impact across the board, with the EU Commission saying that data centres "can and should become climate neutral by 2030".

It is critical that the industry works collectively to meet their environmental commitments.

Reducing the environmental impact of data centres

The most obvious step to becoming greener is in a move away from fossil fuels. Using sustainable energy is something all industries should be focused on. Data centres are particularly well placed to benefit from renewable energy sources due to their stable power consumption. Some operators are already achieving 100% renewable energy in their buildings, resulting in lower emissions of carbon and other types of pollution, as well as cost efficiencies.

Another immediate way to address the data centre industry's environmental impact is to increase the efficiency of their cooling systems, which currently account for around 40% of data centres' energy consumption. This is something we are making great strides in at VIRTUS, using a low energy indirect evaporative air solution. This technique works by drawing outside air through louvres on the side of the data centre and using it to cool hotter air from the data hall via a heat exchanger before being returned as cool supply air.

While cooling is a vital part of keeping data centres up and running, a recent Uptime report estimated that in the US alone nearly 12.5 billion kW hours would be wasted by over-cooling in data centres and improper airflow management. This points to a

wider trend of energy waste in the sector, including "zombie servers" and a significant amount of retired equipment being sent to landfill rather than recycled. To tackle this, providers like VIRTUS are not only investing in comprehensive recycling schemes, but are also using highly efficient UPS (uninterruptable power supply) systems which have the ability to hibernate parts of the system when they are not being used.

The most committed providers are focusing on delivering a "cradle to grave" green strategy, where environmental ambitions are built into every step of data centre construction and maintenance.

Forward thinking data centre providers design and build their facilities with energy efficiency in mind from the start, for example adopting the latest in building technologies and sustainable sourcing of materials. By establishing proactive sustainability and efficiency measures at inception and leveraging the latest technology, data centre providers can ensure that their facilities are operated, and maintained more sustainably – ensuring a smarter, cleaner way of consuming energy and water.

When it comes to the first step, building facilities, BREEAM standards look at the environmental credentials of commercial buildings, verifying their performance and comparing them against sustainability benchmarks. VIRTUS adopts this best

practice with a number of facilities rated BREEAM "Excellent", placing them in the top 10% of UK non-domestic buildings.

Once a building is up and running there are plenty of ongoing concerns to address. For example, recycling of waste is crucial too. Last year VIRTUS Data Centres recycled 94% of waste across its business.

Reaping the rewards of a green strategy

Some data centre providers are already taking many positive steps to reduce their environmental impact. But it's not just the planet that will benefit if the industry meets its "carbon zero by 2030" target. Becoming energy efficient makes commercial sense as much as it does environmental sense. It is very possible to have a highly efficient data centre without affecting the overall health and reliability of a facility. Indeed, experts agree that the two go hand in hand.

When it comes to renewable energy, the benefits of going green are very clear. The reliability of grid power varies around the globe and can challenge providers to maintain service at the level that their users expect. Renewables are demonstrating increased reliability and helping providers to deliver an uninterrupted service. At a time of significant fuel price fluctuation, the use of renewable energy can offer greater stability of electricity costs, thanks to fixed price model options. Previously renewable energy came with a cost premium, but increased availability has

demonstrated that renewable energy can be effectively priced at, or below, the cost of conventional sources – providing an added cost benefit for data centre providers.

A positive sustainability strategy will not only cut costs and boost efficiency, it will also help meet customer demands. Businesses are now asking their providers for evidence of robust sustainability and carbon reduction measures to complement their own, and are choosing partners based, in part, on whether they are delivering on an environmentally sound strategy. However, customers should be mindful that there are "shades of green". Some data centre providers are more sustainable than others, despite all of them claiming green-credentials. For example, burning bio mass is carbon neutral, but not as sustainable as using wind, solar and tidal power.

In conclusion

There is plenty of evidence of progress already being made, powered by much investment, thoughtful design and innovation. The ability of IT equipment to operate at higher temperatures has increased in recent years, which has significantly reduced the need for energy-intensive mechanical cooling in many climates.

It is through accelerated Research and Development programmes that more energy efficient technologies are quickly becoming available across the board. Perhaps ironically, given the technology sector's contribution to global emissions, it's by harnessing the latest technologies that can help data centre operators to reduce the environmental impact of their own facilities.

More most definitely needs to be done before the industry becomes fully carbon-neutral, but we are optimistic about the future. By building facilities that tackle the pressing issues of today, whilst also preparing for the growing demands of users, we are moving towards long-term sustainability and success.

Reference

[1] http://www.digitaljournal.com/tech-and-science/technology/a-look-at-the-huge-amount-of-energy-consumed-by-data-centers/article/564520