



# FRONT AND CENTRE

**GREEN DATACENTRES ALL THE RAGE AS ENVIRONMENTAL CONCERNS AND ECONOMICS COINCIDE**

**T**he quest for energy-efficient datacentres is picking momentum. The realisation has dawned that our digital world could lead to an unprecedented rise in energy consumption in the datacentres that are the beating heart of this digital stratosphere.

Energy consumption in the datacentre accounts for 20% to 30% of the total cost of ownership (TCO). With vast amounts of power required to operate and cool today's advanced IT equipment, it is prudent to look for ways to reduce this huge operational expense, observes Prem Rodrigues, sales and marketing director for the Middle East, India and SAARC at Siemon.

There's a whole movement behind energy-efficient or green datacentres, whether driven by cost or concern for the environment.

Green datacentres are on the rise in recent times due to the increasing power costs that in turn have their impact on operations costs cutting across storage, management as well as the customer service deliverables.

Financial implications for green data centres have far-reaching effects. The prominent areas where cost savings are visible include some of the most advanced tools for datacentre efficiencies. "From power consumption with energy-efficient implementations, reduced water usage, efficient refrigerant and cooling systems are some of the ways that lower operating costs and are high on environmental benefits," says Ganesh Bhat, head of data centres, eHosting DataFort.

That said, energy savings are more than rewards, irrespective of incentives or not, says Bhat. "While there are direct cost-saving implications, indirectly, we can contribute towards reducing the carbon footprint which is a major concern across the world. In fact, it is good to see the Dubai Electricity and Water Authority (DEWA) now mentioning the equivalent carbon footprint in monthly bills to

make customers aware of their contribution towards the environment."

Bhat says customers themselves are now concentrating not just on the financial implications of using datacentres but are also very keen to be a part of the global phenomenon of becoming more power-conscious and efficient.

"It is this demand which is spearheading datacentre providers like EHDF to make adequate changes to meet customer needs. Therefore, when customers are themselves advancing on their carbon footprint agendas, sustainable datacentre providers aim to match customers' business policies and strategic goals.

"It includes the power to demonstrate to customers on how they can decrease their power consumption, reduce carbon emission and strengthen operational efficiencies," he adds.

The pursuit of greener datacentre infrastructure is both a technological and operational pursuit.

Smart technologies such as automated cooling optimisation using IoT and AI are being employed to modulate the temperature and volume of cooling delivered based on the actual requirement by IT loads on a real-time basis. This is done by placing a dense array of temperature sensors to determine exactly where the heat load is within the data centre, explains Annit Lalla, datacentre lifecycle services manager, MEA, Schneider Electric.

Data is wirelessly transmitted to network gateways, aggregated, and sent to a purpose-built appliance where it is analysed by control software. Control commands are then delivered to the cooling equipment. As IT load changes, the built-in machine learning automatically adjusts cooling output to match the dynamic data centre environment.

"This precise matching of delivery to the actual requirement significantly reduces stress and improves cooling energy efficiency," says Lalla.

## PHYSICAL LAYER

Whilst power consumption has been addressed in recent years through new



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**GANESH BHAT, HEAD OF DATA CENTRES, EHOSTING DATAFORT**

technologies, including Energy Efficient Ethernet, virtualisation, and the development of more efficient cooling technologies, operators must not overlook the physical layer IT infrastructure of a data centre, says Rodrigues.

"The right choice of racks and cabinets, cabling and power distribution units (PDUs) can make a significant difference to data centre energy efficiency and intelligent power utilisation."

Within the physical infrastructure,



“The right choice of racks and cabinets, cabling and PDUs can make a significant difference to energy efficiency.”

**PREM RODRIGUES, SALES AND MARKETING DIRECTOR FOR THE MIDDLE EAST, INDIA AND SAARC AT SIEMON**

the most important area of focus should be cooling and airflow management, followed by improvement in UPS efficiencies, says Lalla. “Cooling easily consumes close to 50% of energy in the data centre and usually has the most potential for savings,” he adds.

The easiest no-cost way to reduce

cooling energy use is to set temperature and humidity set points as per ASHRAE TC9.9 recommended Thermal Guidelines that allow temperature at the inlet of the rack to reach to the upper threshold of 27 degrees Celsius. Use of aisle containment, blanking panels and grommets to avoid mixing and short-cycling of air are other simple measures to improve cooling energy efficiency.

UPS technologies that now provide close to 99% efficiencies are equally beneficial to save close to 4-5% of energy that is otherwise wasted in the form of heat and conversion losses in legacy UPS systems and must be considered during new design or upgrades of data centres. Lower heat losses also require a much lower capacity of cooling infrastructure, explains Rodrigues.

A key principle to understand is that reducing energy consumption can reduce the power capacity-related costs as well as the energy costs, Lalla observes. “Temporary savings like load shedding or server power management reduces electricity costs but do not necessarily reduce the power rating of the physical infrastructure and the related capital costs. Permanent or structural changes like high-efficiency servers or high-efficiency UPS systems reduce both the electricity costs and the infrastructure costs. For data centres, a general rule is that structural consumption avoidance is worth approximately twice as much as temporary consumption avoidance.”

Cabinets that are designed to control airflow can have a huge impact on maximizing thermal management and efficiency. For example, high-flow front and rear doors that allow for 82% airflow will facilitate proper hot aisle/cold aisle circulation, observes Rodrigues.

Cabinet accessories such as brush guards, blanking panels and grommets also help control airflow and temperature. Vertical exhaust ducts (chimneys)

can passively direct exhaust heat from active equipment into the return air space to increase HVAC efficiency and can be field extended to a range of ceiling heights. This keeps hot air from entering the data centre space and controls the flow of air to the CRAC units, increasing the delta T (the difference between intake and exhaust temperatures) for optimal efficiency.

Another aspect to consider is cable management, says Siemon’s Rodrigues. Proper vertical cable management that moves datacentre cables out of the horizontal equipment mounting areas and away from equipment cooling fans improves overall airflow and cooling efficiency.

Wider 800mm-wide cabinets, like those offered as part of Siemon’s Wheel-House range of data centre cabling systems, feature zero-U space on each side of the cabinet for cable management, patching and for power distribution units (PDUs). This improves thermal management inside the cabinet but also allows for increased active equipment density in the cabinet’s horizontal space.

On the software side of things, the latest DCIM platforms can now be fully automated be it for inventory management, capacity management, change management or IT optimisation.

“DCIM platforms can further be integrated with IT and network management tools as well as building management and utility level power management software to analyse and understand the impact of changes in one system to another,” says Lalla.

Colocation providers can use DCIM tools, like a tenant portal, to inform their tenants of their operational status. The operational status may mean the amount of power a tenant is using any given day, or the maximum temperature their IT equipment gets at the front of the rack, or even the optimal location

**25%**  
Ratio of energy consumption to TCO

to install their next server, based on the availability of network ports, power, cooling, and rack space. “This transparency goes a long way in building trust and goodwill with their colocation partner,” says Lalla.

**COMPETITIVE ADVANTAGE**

Indeed, cloud service providers are at the forefront of the global drive for efficient datacentres.

Bhat says eHDF is making progressive changes in its datacentre, an ongoing process across various upgrades and implementations. “The last two years have been major game changers with considerable investments of around AED 2 million to strategically work towards becoming more energy efficient. It has also helped us in making inroads into lowering our power consumption and carbon footprint,” says Bhat.

eHDF’s investments in energy efficiency have been centered around cooling systems equipped with the latest technology. “We have laid overhead cable trays within our datacentres which are double layered to accommodate copper and fibre-optic cables. Additionally, our power cables are placed under a raised floor which helps in energy efficiency. These initiatives are also supported by the re-alignment of the hot and cold aisles. This has benefitted in uniform and unhindered airflow which allows for higher energy efficiency,” Bhat explains.

In a competitive landscape where

every player is using the same energy source at the same cost, reducing energy spend becomes a key differentiating factor in staying ahead in the game and improving margins that can be passed on to the consumer or ploughed back as investments in innovation, automation and upgrades, observes Lalla.

It is also important to note that climate change is impacting every region in the world including the Middle East. “Using more energy-efficient and cleaner technologies ultimately don’t benefit just the immediate user but also has a larger impact in reducing overall demand for power that is generated using fossil fuels,” Lalla adds.

Energy is a key ingredient to facilitate economic development in the Middle East. Expectations for a rapidly growing economy in the next decade will likely cause an increase in the fraction of energy consumed domestically limiting what is available for export. These challenges are the biggest for resource-rich countries since their economy is heavily dependent on fossil fuel exports alongside an energy-intensive economy, observes Lalla.

“However, inefficient energy production and consumption have played a role in the deterioration of the energy landscape in the Middle East compared to the global energy system. Thus, this highlights the necessity for suitable energy strategies and effective policies that will be central to sustainable energy development,” Lalla adds.



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**ANNIT LALLA, DATACENTRE LIFECYCLE SERVICES MANAGER, MEA, SCHNEIDER ELECTRIC.**

Rarely do commercial and ethical pursuits intersect. However, in the quest for greener datacentres, customers, service providers, and technology providers seem to be talking with both their hearts and their pockets. Building more energy efficient datacentres is as commercially-viable as it is noble. ●

