DCD > ebook

The Sustainability Challenge

A guide to creating actionable sustainability strategies to implement efficient design, optimize operations, introduce renewables and decarbonize supply chains.

Schneider Electric

Chapter 4:
Optimizing Operations

Why digitization holds the key to your sustainable strategy
With increasingly distributed IT and complex workloads, Claire Fletcher, DCD, takes a look at the increasing role of software in driving sustainability.

A Framework for how to modernize data center facility infrastructure
Patrick Donovan, Senior research Analyst, Data Center Science Centre, Schneider Electric, highlights a 4-step framework for data center modernization and performance

Waste heat warms up
Graeme Burton, Content Head, DCD, talks circularity and district heating schemes - looking at how data centers can better serve the communities they are in.

Why digitization holds the key to your sustainable strategy

Not only must we make technology itself more environmentally friendly but we must also deploy the technology responsibly and effectively to become more sustainable. Digitization and transparency can help achieve this.

Digitization continues to transform how we work and live. As the role of technology in day-to-day life deepens, however, so does the amount of energy it consumes.

Innovations in technology also provide us with sustainability enablers, allowing organizations to shrink carbon footprints and manage energy more efficiently. We are facing, therefore, what Accenture have referred to as a twofold-imperative; not only must we make technology itself more environmentally friendly but we must also deploy the technology responsibly and effectively to become more sustainable.

For data centers, this means continued improvements in operational efficiency and new paradigms in using technology to drive efficiency.

Indeed, the data center of the future will bear little resemblance to the cabinets of old. The next gen data center will have more interaction with the grid and renewables; greater power variability with IT as efficiencies start to improve; a mix of complex cooling architectures, and more sites to manage in a hybrid environment.

DCD talked with Kevin Kent, CEO, Critical Facilities Efficiency Solutions, on how the industry could meet this challenge. He proposed the key question the data center industry should be asking itself; 'what evolving technologies can we exploit and how can we best utilize them?'

Is data intelligence the key?

With increasingly distributed IT and complex workloads, the smart use of software allows "operators to take a more proactive response to monitoring, management and sustainability', says Kent. Ensuring we get these services in place requires a combination of connected devices that need to become more intelligent whether they're located on the edge or in data centers. 'Do we actually have the right software tools to help us manage that and understand how equipment is performing and what alterations are required'?

In addition, Kent notes, "we must also consider if we have a strategy on lifecycle optimization to ensure that equipment is being maintained, recycled and de-risked". What are the operational efficiency options you have to maximize this lifespan?

For the hyperscalers and public cloud providers, digitization and intelligent use of data is already part and parcel of data center deployment and operations. Google has previously

When it comes to collecting data, bad data is worse than no data

detailed how it uses DeepMind AI for cooling and was able to cut PUE by 15 percent through the automatic management of variables including fans, cooling systems, and windows. The company has also used DeepMind for predicting the output of wind turbines up to 36 hours in advance, which it used to predict power needs for its facilities connected to wind farms.

Safety and security applications such as automatic temperature checks, touchless authorization, payment and control systems, and traffic monitoring, which played a vital role throughout the pandemic are also likely to remain in the future. As Olivier Micheli, CEO, Data4 told us, "Automation provides many benefits but requires smarter and more intelligent planned systems and infrastructure to ensure security from end to end. These approaches provide assurance to customers, and their customer's customers'".

How can deploying monitoring software help?

In 2021, legacy software isn't quite

cutting it. We need intelligent dashboards that will help us identify solutions more quickly.

Schneider Electric's EcoStruxure solution deploys software, analytics and services across three main domains: EcoStruxure Power, EcoStruxure Building and EcoStruxure IT, allowing customers visibility across all aspects of their organization.

Most colocation customers today also now expect sustainability reports alongside their financial ones. And if you're not quite sure how to go about that, Schneider Electric has answered that call with EcoStruxure Resource Advisor.

This innovative tool supports a data center's ability to carry out sustainability reporting, helping to appease climate conscious customers and their demands for green credentials.

EcoStruxure Resource Advisor can tell you what your carbon emissions are, your energy procurement costs, what type of energy it is you're procuring, and whether it's clean. It will also provide guidance with project planning and risk management. Resource Advisor doesn't just monitor traditional infrastructure, but reaches into other areas that may previously have been overlooked, or limited to the sustainability office (should your business have one).

Implementing energy management software such as this, can actually help your bottom line too. Data points accumulate fast, and before you know it, your business may have generated millions pertaining to energy and sustainability. Imagine all that complexity spread out across disparate systems and a hodgepodge of locations, being used by separate teams who can't easily share information, it's a headache waiting to happen.

Resource Advisor allows you to collect multiple types of data, from spreadsheets and invoices, to meters and submeters, from every facility, all in a single platform. This provides invaluable visibility to enterprise KPI's, as well the ability to identify opportunities with cloud-based software that will scale with the business.

And when it comes to collecting data, bad data is worse than no data. Schneider found that up to 80 percent of customer data requires 'data cleaning', this is why when collecting and aggregating data, Resource Advisor can help ensure this is accurate, as data streams undergo stringent industry-standard quality testing and cleaning.

Good, dynamic data can then be leveraged across your entire enterprise to not only save money, but increase efficiency and transparency. But even when you have good quality, accurate data, data on its own is useless. To make the most of it, you need the right internal resources in place to make sense of it all. A recent Intel study found that when presented with a list of big data challenges, the response was overwhelmingly 'data analytics' and 'data expertise'.

Luckily, Schneider has all the internal expertise you'll ever need to help you translate your data into action. Survey tools featured in Resource Advisor can be utilized to both collect and analyze data, allowing you to make informed decisions based on good quality data and intelligence tools.

Schneider also has a dedicated global data operations team, whose sole purpose is to help customers achieve an accurate and complete data set which affords them global reporting capabilities via Resource Advisor.

The Schneider data team validates customer data, then makes it available for reporting. In the past 24 months alone, invoice validation efforts have uncovered over €45 million in invoice errors, so even if you think you know what you're doing, there's always room for improvement.

Echoing this sentiment, Sudhir Kalra, SVP, Global Operations at Compass Datacenters says, "The people working within the data centers and data center operators need to be increasingly 'computer' savvy. Mechanical and engineering knowledge will always be valuable, but a diagnostic and analytical understanding of internal issues will become more important."

As data centers become larger, more complex and increasingly integrated into everyday life, knowledge will become ever more prevalent if constant uptime is to be maintained.

Maintain and modernize

Naturally, all this new and improved visibility extends to lifecycle services,

not only considering how you can maintain and extend the life of your facility, but also any potential modernization, whether this be from scratch, or improving what's already installed. it's a case of striking an amicable balance between maintenance and modernization in order to hit that sustainability sweet spot.

If you're not in a position to modernize right now, it's worth having a stringent maintenance plan in place. Schneider offers digitally augmented maintenance services in four key areas: electrical distribution, UPS, cooling and EPMS/BMS.

By moving from traditional calendar-based to condition-based maintenance, maintenance is carried out when it's actually needed, resulting in reduced budgets of up to 40 percent, as well as an 80 percent reduction in electrical failure due to fire. This not only ensures maximum operational efficiency (whilst reducing the risk of downtime) but helps extend the life of your equipment through the proactive replacement of parts.

According to Schneider Electric's Steven Carlini, robots (and ever-advancing AI technology) could also be a viable option in automating data center operations.

Some of these robots have already demonstrated the ability to replace servers housed in data center IT racks. And although at the moment anything more complex might be a little challenging, in a world almost unrecognizable from the one we knew a couple of years ago, anything is possible.

Robots of the future aside, if you can modernize alongside your maintenance plan, then all the better, but you needn't overhaul your entire facility.

For example, replacing only active components as opposed to a whole unit, will minimize raw material consumption, and ensuring your infrastructure is 'right-sized' to fit your needs will save you money. It might sound simple, but time and time again organizations panic and over provision; aligning your infrastructure with current operating conditions is an impactful way of reducing energy consumption.

Replacing only active components as opposed to a whole unit, will minimize raw material consumption

If you'd like to marry together the best of both maintenance and modernization, Schneider advises the implementation of smart sensors in order to transform your equipment into connected assets, enabling software analytics to optimize operations and make data-driven decisions that improve efficiency. Smart sensors are also useful for predictive maintenance, to ensure faults are spotted before anything goes wrong.

Refurbish and remanufacture

Older equipment is staying in service longer than ever before in a bid to cut costs. Cost control and maintaining productivity can be a tricky balancing act, but to help tip the scale, it's worth considering remanufactured equipment.

Schneider offers a vast selection of remanufactured industrial electronics, including many items that are fully remanufactured, certified, and protected by a comprehensive warranty.

Remanufacturing does more than breathe new life into older equipment; every remanufactured part is upgraded using the latest technology and to the most up to date standards. Second life doesn't have to mean second best.

Reuse and redistribute

Say you have a perfectly good product that has become obsolete, perhaps due to advances in technology, what do you do with it? You can reuse it.

Although linear-economy thinking might suggest scrapping obsolete inventory through traditional recycling to reclaim the component materials, that sacrifices the value that was added in the design and manufacturing process. Instead, applying circular-economy thinking acknowledges and retains that embedded value.

In 2015, Schneider began working with the supply chain and marketing teams in one of its divisions to identify products for which this approach made sense. From there, a secondary market could be found for those products that are no longer fit for (original) purpose.

Finding a secondary market not only generates cash at the consolidated contribution level, but opens up new markets, increasing the customer portfolio, with no disruption to the primary channel.

Recycle

If you've exhausted all other options and you're still left with equipment that is no longer viable in your critical data center, then the last port of call should be recycling.

Ninety-eight percent of a medium voltage cubicle can be recycled, and Schneider has saved over 35,000 tonnes of CO2 through its End of Life (EOL) services.

Schneider takes full responsibility for the end-of-life processing of obsolete electrical equipment, with an IEC compliant solution that also deals with SF6 gas – this includes providing you with a recycling or destruction certificate for traceability and peace of mind.

Overall, by implementing only what you need (as opposed to what you think you need) and recycling what you don't, based on accurate, clean data, the right software and expertise can be an invaluable asset when it comes to ensuring your sustainability goals are achieved, as well as any otherwise hidden opportunities for sustainability that may not have been realized.

A Framework for How to Modernize Data Center Facility Infrastructure

Patrick Donovan is a Senior Research Analyst for the Data Center Science Center at Schneider Electric. He has over 20 years of experience developing and supporting critical power and cooling systems for Schneider Electric's IT Business unit including several award-winning power protection, efficiency and availability solutions. An author of numerous white papers, industry articles, and technology assessments, Patrick's research on data center physical infrastructure technologies and markets offers guidance and advice on best practices for planning, designing, and operation of data center facilities

As physical infrastructure systems age beyond their warranties, software tools no longer reflect or comprehend reality, and operations & maintenance (O&M) programs grow outdated and/or become under-staffed, the risk of an interruption in service goes up significantly. Aging data centers must either be modernized or have its IT outsourced to cloud service and colocation providers to minimize the risk of business disruption. Remaining sites that delay modernizing also fail to benefit from recent technological advances. These improvements make data centers simpler, more efficient, easier to manage, and less expensive to operate today.

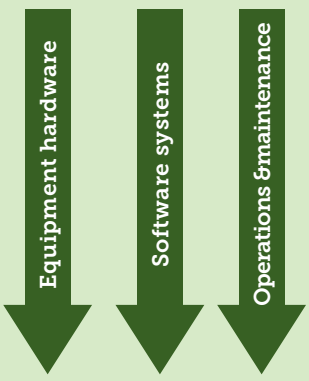
This article lays out a simple 4-step framework for how to go about modernizing a facility. It begins first with developing performance standards. This is then used to perform a gap analysis identifying risks and needs. This approach, developed by a team of Solution Architects at Schneider Electric, should be used to cover the three key domains of data center modernization: (1) equipment hardware (electrical & mechanical), (2) software systems, and (3) operations & maintenance programs. Keeping the IT systems running depends on all three of these domains. So, it is critical that all are considered in a modernization project.

4 Steps of the Data Center Modernization Framework

The four-step framework is a measured and methodical process to determine what to modernize in your facility, and how and when to

Four-step framework for modernization

1. Develop performance standards
2. Benchmark performance & identify health risk
3. Determine options to address gaps
4. Prioritize actions based on cost, feasibility, risk



do it. It is best applied holistically, across domains, but can be applied to a single domain within your data center as well.

1. Develop performance standards — It is important to first start with documenting the specific objectives and goals of the modernization project. What do you want the data center to look like at the end of the project? How should it perform and what is needed to achieve that? It is useful to start with the larger business and IT objectives. These may well have changed since you first built the data center. The criticality and power capacity needs may have changed significantly as a result. Re-evaluating your needs in the context of today's organizational objectives will help you figure out, for example, what level of electrical redundancy is really needed or what the operations team staffing levels should be at a given site.

A performance standard for each of the key domains should be written down and documented. If, for example, the decision is that the data center should meet a particular tier or criticality standard, then what it takes specifically to meet those requirements should be documented in the design standard. Make sure you have buy-in from all the key stakeholders and an understanding of what the IT outsourcing strategy is. An example performance standard is shown below for the power and cooling systems:

Technological advances make data centers simpler, more efficient, easier to manage, and less expensive to operate today.

2. Benchmark performance & identify health risks — With the performance standards clearly documenting in detail where you want to be, the next step is to evaluate what the current state of the data center is across all three domains and noting what is at risk of causing incidents. This involves physically investigating the infrastructure equipment and their interconnections. You want to understand each device's age, maintenance contract status, load vs. capacity, etc. It means interviewing the O&M team and reviewing their methods of procedure and training documentation. You should not just rely on drawings or written reports. Data center infrastructure management (DCIM) tools should be checked against the equipment benchmark to see how well the software map of assets and their interconnections match reality. Use the performance standard documents as scorecards to record the current reality and to identify gaps in performance and health risks.

3. Determine options to address gaps — With the current situation documented, the next step is to

System	Attribute	Level 1 Standard	Level 2 Standard	Level 3 Standard
Power	UPS redundancy	N	N+1	2N
	UPS battery runtime	5 min	10 min	15 min
	UPS battery type	VRLA or Li-ion	Li-ion	Li-ion
	Generator redundancy	N	N+1	2N
	Generator fuel onsite	24 hours	48 hours	72 hours
	Branch circuit monitoring	No	Yes	Yes
Cooling	Heat rejection redundancy	N	N+1	2N
	Air distribution redundancy	N	N+1	N+1
	CRAH fans	Fixed speed	VFD	VFD
	Economizer mode	No	Yes	Yes
	Thermal storage	No	30 min	1 hour
	Aisle containment	No	Yes	Yes

Example of performance standards

consider and document what it would take to bridge each of the gaps. Vendors and consulting engineers may be needed to clearly understand what your options are, as well as their costs. This effort will begin to form a picture of what it will take time, money, and labor-wise to achieve the project goals. This, in turn, could cause you to re-evaluate the design standards. And that's OK, this is designed to be an iterative process.

In addition to benchmarking against your performance standard, a basic "health check" should be conducted to identify systems at risk. This health check should evaluate:

- Age of devices and warranty status
- Maintenance history and service contract status
- Current load vs. capacity of systems

As devices age, they present greater downtime risks. Components are more likely to fail or require maintenance. Many devices as they age are also not under maintenance contracts.

4. Prioritize actions based on cost, feasibility & risk — The last step before the actual implementation of upgrades and replacements begins, is to prioritize the actions needed to close the gaps to bring the data center to the performance levels spelled out in the design standards. Being a (presumably) mission-critical data center, all gaps need to be evaluated based on the amount of risk they represent to the continued functioning of the IT. For each gap uncovered in the audit, you must calculate the risk of not addressing it. Obviously, gaps with the biggest risk go to the top of your list of needs to focus on. This risk needs to be balanced against cost, time, how disruptive it might be to on-going operations, and any other objectives deemed important, such as energy efficiency goals.

Note there are 3rd party vendors who can assist you or even lead this evaluation process. Not only would they simplify and likely accelerate the process for you, but you would benefit from their having experience with many data centers. Also, their independence might make for a more accurate, unbiased judgement of what risks might exist in your facility.

Identify & Address the Basics (Low-hanging Fruit)

During the processes of creating the performance standards and benchmarking performance, you will likely uncover easy-to-fix issues, i.e., items involving relatively little to no CapEx and time to implement. These should be addressed right away, of course. Low-hanging-fruit actions we often see include:

- **Power:** conducting preventative maintenance (PM) services on units that are past due, removing unused power modules from UPSs, redistributing unbalanced loads, correcting mistakes in PDU/Rack PDU assignment if redundancy rules are found to be broken, etc.
- **Cooling:** conducting past-due PM services, adding blanking panels to racks, plugging holes in raised floors, removing obstructions from underfloor air pathways, making sure floor tiles are in the right places, making sure racks are aligned properly, etc.
- **Operations:** updating/correcting as-built drawings, ensure methods of procedure (MOPs) and emergency operating procedures (EOPs) are correct and in the right places, verify staff is properly trained on emergency procedures, etc.
- **Software systems:** reviewing and making sure all software tools have an accurate map of assets, resources and their dependencies are mapped correctly, and reviewing alarm thresholds and notification policies.

Following and adhering to this framework will simplify the process and reduce risk. It will optimize costs by focusing spending on process improvements, hardware upgrades, and replacements that have the biggest impact on reducing critical incidents and failures that can cause downtime of the IT systems and applications. And new business requirements may mean the infrastructure needed today may be much less than what you needed when it was first built. When you combine that with the likely efficiency gains that modern infrastructure and their management tools bring, the real total cost of ownership of a newly modernized facility is often less than you expected.

To learn more, download Schneider Electric white paper 272: A Framework for How to Modernize Data Center Facility Infrastructure.

This framework will optimize costs by focusing spending on process improvements, hardware upgrades, and replacements that have the biggest impact on reducing critical incidents and failures that can cause downtime of the IT systems and applications.

Waste heat warms up

90 percent of the thermal energy that goes into a data center can be recovered. So how do we make waste-heat more useful?

When Facebook was looking to Denmark as a key location in its network of global data centers, part of the brief for the designers was to maximize every possible aspect of sustainability. One item on that list was the idea of reusing waste heat from data center cooling systems - a proposal that has excited interest for some time, but has often foundered on the practical realities of implementation.

It doesn't take complex technology to convert waste heat into something useful. The challenge is the expense, combined with the fact that data centers are often a long way from the locations that can actually do something useful with their second-hand energy.

But that's changing, and Facebook is just one high-profile proponent, along with Amazon Web Services, Google, and others. In Denmark, Facebook was able to secure a tie-up between its third facility, in Odense, and the local district heating company, Fjernvarme Fyn, to recycle warm air extracted from the 'hot aisle' of the data center.

"The warm air is directed to our cooling units. This warm air is directed over a coil – cold water comes in, the air heats up the water, and the warm water is then piped across the street to the heat pump," says Lauren Edelman, energy program manager at Facebook.

Once the air reaches Fjernvarme Fyn the temperature is boosted using a heat pump – powered by renewable energy – before the water is delivered into the district heating network.

This scheme is expected to recover some 100,000-megawatt-hours of energy per year, which Facebook estimates will warm around 6,900 homes.

The drive behind such sustainability initiatives comes after 10 to 15 years of technology companies and data center operators pushing the power usage effectiveness (PUE) down from above two – the US average is around 2.5 – to figures ever-closer to one, says S&P Global Market Intelligence senior research analyst Daniel Bizo.

Improving PUE means data centers consume less energy. Reusing their waste heat is an additional benefit, but it needs infrastructure. And, while the European Union has been pushing district heating schemes as an environmentally friendlier alternative to electric or gas central heating, these are not widely used outside of Germany, Scandinavia (excluding Norway), and a handful of other places.

The difficulty of finding alternative uses for data centers' waste heat is illustrated by Google's latest data center opening in Middenmeer, the Netherlands.

While the company claims it has been able to radically slash power consumption per unit of compute power in its data centers, compared to the data centers it opened less than ten years ago, its waste heat re-use at Middenmeer doesn't currently extend any further than helping to heat the office space at the data center for its 125 employees.

Staying cool

Erik Barentsen, a senior policy officer, energy and sustainability, at the Dutch Data Center Association notes that there are basically three main forms of data center cooling. The first one, direct air cooling, "is not really applicable for recovering waste heat," says Barentsen.

"The second is where you have computer room air conditioning, in which the air in the IT room is chilled," he adds. With servers arranged in 'cool' and 'hot' aisles, the exhaust air can be extracted, run through a heat exchanger and returned to the cool aisles, helping to lower air conditioning costs, as well as extracting heat for re-use.

However, the typical exhaust heat from an ordinary air-cooled data center is only between about 25 degrees and 35 degrees celsius, he adds, limiting its value without the addition (and expense) of a heat pump to boost its temperature.

The third system, says Barentsen, is by deploying liquid cooling. "Liquid cooling can be done either through immersed technology, where the whole system is immersed in oil and the oil itself is conditioned to a certain temperature, or you can use a closed-loop liquid cooling system," he says.

The main benefit of liquid cooling, adds Andy Lawrence, executive director of research at the Uptime Institute, is that servers can be run hotter and harder, while higher exhaust temperatures widens the scope for re-use. Using liquid cooling, server racks can be also more densely packed.

"The exhaust heat is going to come

out piping hot – above 50 degrees Celsius would be quite common – and using it for hot water or heating would make a lot of sense," says Lawrence.

But, notes Barentsen, liquid cooling doesn't improve overall data center efficiency – it merely makes exhaust heat re-use more viable.

"In essence, the amount of waste heat recovered compared to the electrical input will remain the same: 90 percent of the thermal energy that goes into a data center can be recovered," says Barentsen. "However, at least for the time being, the residual heat temperature will make a difference because with liquid cooling the residual heat is easier to use in a district heating system."

Even then, there are challenges over how to re-use this resource if there isn't a friendly neighborhood district heating company willing to take it off of the data center operator's hands.

The US National Renewable Energy Centre, for example, used excess warm air to heat the pathways around its HQ in Golden, Colorado in order to keep them free from snow and ice in winter, but that is scarcely an efficient use of a valuable resource.

A more practical alternative solution has been developed by Dutch tech company Blockheating, together with consultancy IT Renew. It has devised a containerized data center that can use liquid cooling to maximize heat capture, piping the result to commercial greenhouses – for which the Netherlands is famed – to help keep tomatoes and bell peppers growing throughout the autumn and winter months without the use of gas.

In Denmark, Facebook was able to secure a tie-up between its third facility, in Odense, and the local district heating company, Fjernvarme Fyn, to recycle warm air extracted from the 'hot aisle' of the data center.

Its 200kW Edge data centers use liquid cooling – enabling more compute power to be packed into a relatively small space – that can be converted into water at a toasty temperature of 65 degrees celsius.

However, the demand for such Edge data centers next to greenhouse facilities is likely to be highly niche, and while gas prices are low it's unlikely to gain much traction, suggests Barentsen.

Tighter regulation

What may help drive data center exhaust heat re-use is a combination of the broader corporate push towards carbon neutrality and sustainability – especially among well-healed organizations that can most easily shoulder upfront expenses – and regulation, particularly in the European Union.

For around the past decade, the EU has been pushing member states to implement district heating schemes, providing funds for start-ups, arguing that district heating is more efficient and less carbon-intensive than either electric or gas central heating.

Indeed, part-funding from the EU is behind a district heating scheme in Dublin, Ireland. South Dublin County Council – under whose authority the Castlebagot 'digital business hub' falls – has established its own publicly owned energy company, called Heatworks, to pipe heat from data centers in the hub to the newly established Tallaght District Heating Network.

More recently, there have been calls for tighter regulation of the data center industry, especially following a December 2020 United Nations report claiming that carbon emissions from the construction and operation of buildings now accounts for 38 percent of total global energy-related CO2 emissions. Heating (and cooling) buildings around the world is responsible for just under 10 gigatonnes of CO2 emissions, it claimed.

But for the time being, warns Lawrence, proponents of liquid cooling need to convince an industry geared towards air cooling that it is the way forward.

"The case for liquid cooling is quite strong, but... every designer knows air systems. There's lots of equipment out there, lots of standardized designs and it's cheaper in terms of capital outlay," says Lawrence.

EcoDataCenter Case Study

"When we build a data centre, we consider how we're part of the community. With EcoStruxure IT Advisor, we can give something back to the local grid." - Mikael Svanfeldt, Chief Technology Officer, EcoDataCenter

The challenge

- Focused on sustainability, EcoDataCenter needed an ultra-low carbon footprint data centre at the heart of its HPC colocation in Falun, Sweden.
- EcoDataCenter wanted to set up an ultra-efficient, reliable power management system to support this project and ensure customer-server uptime.
- The company also sought greater physical security and cybersecurity for data safety and communications between clients.

The Solution:

Sustainable digitization with EcoStruxure solutions

Apps, Analytics & Services: EcoStruxure IT Advisor, Connected Services Hub

Edge Control: EcoStruxure IT Expert, EcoStruxure Building Operation, EcoStruxure Energy Expert, EcoStruxure Building Expert

Connected Products: Uniflair™ Turbocor Chillers, APC™ Netshelter, Galaxy™ VX UPS, Pod Data Center, InfraStruxure™, Masterpact™ MTZ, Premset™, rPDU, Smart Panels (IEC), Sensors & RFID, CRAH-units, Canalis™, Lithium-ion batteries, cooling centres, AHUs, and heat pumps

- As EcoDataCenter's chosen partner for the project, Schneider Electric's EcoStruxure for Cloud & Service Providers solution was ideal for working effectively with third-party solutions.
- Connected Services Hub, a dedicated team from Schneider Electric data centre experts, remotely monitors, troubleshoots and analyses EcoDataCenter's critical facility 24/7.
- Two Uniflair™ Turbocor Chillers add to facility climate control, supplementing the usually low Nordic temperatures, especially during summer's humidity.

The Resuts:

- EcoDataCenter now has connected sensors and meter data generating analytic reports on the data centre's operational efficiency — and its sustainability index.
- Within EcoStruxure architecture, four Galaxy VX UPSs support 1,250 kW of customer load in its 99% efficiency ECOnversion Mode. This backup power frees up energy that can be diverted to clients.
- EcoStruxure proves to be crucial in helping recycle the facility's heat waste. Now, EcoDataCenter uses that efficiency to give back to the local grid, keeping the company focused on being one of the most sustainable data centres in the Nordics.