By: **Swedish Modules & ABB**

The OCP movement creates new opportunities to develop sustainable Data Centers: White Paper about embracing the opportunities in the Data Center Industry.

OCP is creating new levels of sustainability for Data Center Design

The growing use and development of OCP hardware, is beginning to make a big impact on the design work for Data Centers. The Open Innovation Community are growing and the projects with direct or indirect impact on the data Center design increase every week. Optimization on every level is the order of the day and the mission to develop a sustainable infrastructure for the digital society seems to be more and more central tasks to work with. Saving energy is saving the environment - and saving money, so the motivation is high for those stakeholders who run their business within the telco and IT-service markets. What about the rest of us? The industry upstream, the developers and innovators of the construction, the mechanical-, the electrical- and the security systems. Are we open together?

Over 200 OCP-Projects are in the pipeline, ready to be released in open source format to the market. The Global OCP Summit gathered 3,600 attendees this year. There were team members from 727 organizations and 42 countries around the world. There were 13 Engineering Workshop tracks, comprised of 135 sessions. From the Academy, the following Universities participated in the OCP Future Technologies Symposium; MIT, UC Berkeley, Princeton, Northwestern, Smith College, UC Santa Cruz, UC San Diego, UC Santa Barbara, University of New Hampshire, Vienna University of Technology, Qazvin IA University, University of Manitoba and Osaka University.

The use of OCP HW is growing fast

Huawei, Nokia, LinkedIn and Alibaba are some of the Companies that stated their "all in" mindset to use OCP for the deployment of their IT-infrastructure. Microsoft, Facebook and Google have been there for a while. So, what really happens is that OCP hardware shows the same development curve as Linux regarding the pace of usage and adoption! This is a real challenge for the Data Center Industry to embrace. As a matter of fact, we already have most of the technology, competence and know how in place, (locked up in our storehouses)

The Design opens up for new constructions

The new design of OCP hardware; servers, switches, power supplies and racks etc, creates new conditions in the Data Center facillity and opens up for new constructions. OCP hardware is maintained all from the front of the rack, which means that you can design for a narrow rear/hot aisle. The OCP hardware allows much higher inlet temperatures in the cold passage, up to 30-35 ° C are acceptable values, which creates a new baseline when it comes to the cooling systems design work.

Higher temperatures reduce the cost of energy use, but also create new opportunities for reuse of waste heat from the Data Centers. The technology for optimizing the cooling systems with these new parameters is well known in the industry. The systems for free cooling, direct and indirect cooling of fresh air, as well as heat pumps and hot aisles etc are more or less commodity products on the market.

OCP will add positive effects to the already efficient infrastructure

+15%
Reduce of CO2 emission comparing to traditional HW

+30%
External Power supporting System Savings

+35%
Opex Savings by higher Energy Efficiency & decreasing Maintenance Costs

Cost comparison traditional 2N VS OCP 2N.

Example of cost savings due to simplified electrical infrastructure:
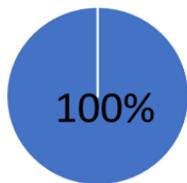
CAPEX
- No centralized UPS + batteries
- Less numbers of circuit breakers and cabling
- Reduced installation cost
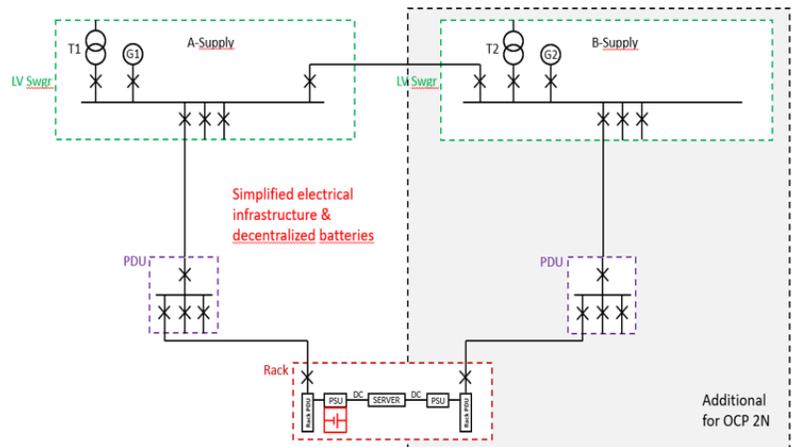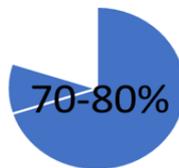- Reduced footprint in electrical rooms, facility cost

OPEX
- Reduced maintenance cost
- Simplified control & operation

Cost traditional 2N

100%

Cost OCP 2N

70-80%

The Design that saves money

When designing the power system for a critical facility as a Data Center, you need to prioritise robustness. Keeping it simple is usually a key for availability and for operational personnel to have a clear picture of the infrastructure. We have seen the industry mature throughout the years. Keeping the cost down for CAPEX and OPEX, building scalable and going from "want to have" to "need to have". OCP design gives us the solution for all of the above. The power train has a high impact of the global resources. OCP helps to reduce mining for minerals and metal which also gives less transports by sea and land. Deploying generators and UPS supply to a minimum in order to only run necessary IT operations on premises saves money. Another benefit that comes with OCP design for the power system, is that the footprint reduces in the power rooms, which helps you reduce the size of your building or gives you a larger white space.

The reuse of energy

We should always strive to use a minimum of energy and to have that mindset for each component in the Data Centre. The growth of the energy use for Data Centers can be terrifying if you look at the forecasted numbers. However, the used energy should be seen as a resource when we are reusing it into our cities district heating systems. The importance of not only increase the efficiency of the supporting systems, power and cooling, but also the need for reuse of the wasted heat, cannot be underestimated.

According to an article written by Wayne M. Adams, the chairman of SNIA's board of directors in nov 2018 *"Power consumption in data centers is a global problem"*, he stated *"About five percent of total global energy usage is by electronics. That number is projected to grow to at least 40 percent by 2030 unless there are major advances made in the lowering of electricity consumption. The information and communications technology (ICT) sector, predicts to use 20 percent of all the world's electricity by 2025, and emit up to 5.5 percent of all carbon emissions."*

In this context we need to open up for the necessity of not only more efficient solutions, but also for the need of reuse the wasted energy and bring it back to society. We need to think Eco systems and close the loop to become sustainable! District heating, Agriculture, Geothermal energy storage, Hydro gas production, Solar cell farms etc. The Data Centers need to be a part of these systems and the Data Center Industry should work in collaboration with all the stakeholders involved, not only our own family.

Positive effects of using an OCP Data Center together with the reuse of energy concept from Stockholm Data Parks
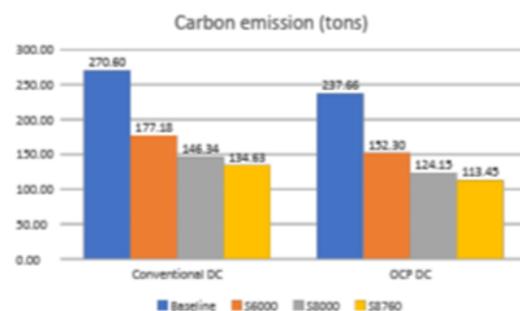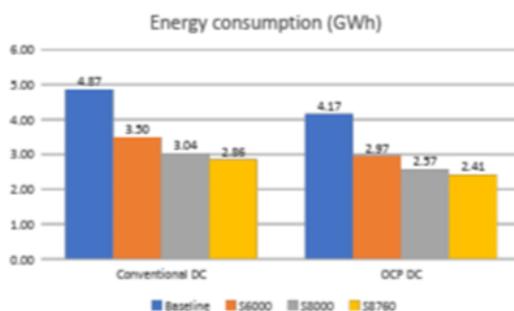
Conclusion

The OCP movement, creates new opportunities to develop sustainable Data Centers, but are we embracing this opportunities in the Data Center Industry? We need to be honest and say: Not for the moment. There are still a lot of work to be done. We must give up "Old School thinking"; that it is the industry that creates rules and standards for the development of new technology, this is not the situation. The next generations of digital solutions will come from the open innovation source, developed by the contributors, who are the engineers, the users, the public authorities, the academy, the farmers, the city planners and the students, etc. We need to invite new guests for dinner if we want to be in this party.

So we will like to call out a challenge, where are ASHRAE and UpTime Institute? Why are you not in this Community with your contribution? We miss you guys and we really will appreciated your presence in this important work for a sustainable society.

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