ICEOTOPE™

Accelerating the transition to a low carbon more sustainable future!

Iceotope for Carbon Reduction

The nationwide adoption of "carbon reduction commitments" by universities and colleges is exciting! Many are making a real effort to reduce energy consumption in absolute terms, setting challenging annual milestones on the journey toward 2020.

However, for many computing (one of the largest single consumers of resources) is a problem area. It seems too big and mission critical to "play with" yet it is destined to be on par with CO2 emissions of the airline industry in the not so distant future. Set against a background of an increasing reliance on computing, something has got to change.

While much of the ICT Industry has focused on reducing energy consumption at a component level and greening their supply chain, they have regarded the implications of Jevons Paradox as upside (i.e. they sell more) and have done little to tackle the externalities of the massive energy intensive systems and bespoke facilities required to house and cool today's IT.

Indeed, converting energy into heat is extremely efficient. However, it is a real shame that most "vent" this valuable resource (namely heat) into our changing climate rather than harvesting and reusing it. Until now.

Iceotope is the culmination of a 5 year UK based R&D effort, originally with the University of Sheffield and Sheffield Hallam and now with the University of Leeds. Iceotope has been established to dramatically reduce the energy required to power and cool IT, to improve the resource efficiency of the primary systems (dynamically reducing the electronic waste) and to provide the possibility for heat reuse.

FACT...

Iceotope uses less energy to power and cool its integrated compute platform than anyone else on the market today takes - JUST TO POWER THEIR IT - that means Full Time Free Cooling with a reduced power load. Impossible? No, just the application of science!

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The Iceotope Solution

The Iceotope Solution uses industry standard IT and "end to end" liquid cooling to deliver improved reliability, better performance and reduced energy footprint. It does not require CRAC chillers, humidity control, air filtration and because the system can be plumbed into the building/district heating system, it can even be located in listed buildings. The hardware itself has been engineered to last and will be reused for 5 or 6 production cycles before recycling.

Silent in operation, the Iceotope Solution can be positioned in people areas. It is isolated from facilities by an integrated heat exchanger, which means a wide range of choices are available including the use of "grey water" in the heat harvesting reuse/disposal process. The Iceotope Solution can save capital expenditure, operating costs and lower CO2 emissions. These benefits accrue to a wide range of key stakeholders, so everyone wins!

FACT...

Iceotope uses an average of 20% less energy to power its servers.

Iceotope requires 97% less energy to cool.

Iceotope can deliver output water at 50°C.

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CO2 Emissions: Liquid Comparison to Air

Based on an air cooled supercomputer with 1MW average IT power consumption, 20% is assumed as internal fans and the system is presumed to have a PUE of 1.8 (Uptime Institute Global Average 2011).

Iceotope is assumed to reduce overall cooling and infrastructure overhead by about 4% with internal pumps at 0.36% of IT load. Actual electronics are assumed to be equivalent for the sake of comparison.

CO2 at 0.544KG/KWh, continuous use of supercomputer is assumed (Iceotope would typically use 0.835MW versus a modern supercomputer, which would consume roughly1.8MW overall).

Electricity cost is assumed at 11.7p/KWh. Headline figures rounded to 2 significant digits. Additional CO2 saving from heat recovery is not considered in the calculation.

FACT...

Versus a modern 1MW (IT load) supercomputer, Iceotope could save up to 4.6 Kt of CO2 per year and as much as £0.97m in electricity. Iceotope's waste heat could also be used to heat buildings, saving additional CO2 from the reduced demand on heating boilers.