Data Centers That Recycle Waste Heat

Waste heat from servers at the new Telecity Paris data center (left) is being used to heat an on-site arboretum (right).

A growing number of data centers are redirecting the heat from their hot aisles to nearby homes, offices, greenhouses and even swimming pools. The ability to re-use excess heat from servers is being built into new data centers, helping to improve the energy efficiency profile of these facilities. We've pulled together some interesting examples of heat recycling below.

Telecity (France)

The latest example comes from **Telecity,** which is using waste heat from its new [Condorcet data center] in Paris to heat an on-site Climate Change Arboretum, where scientists will recreate the climatic conditions expected to prevail in France in 2050. Société Forestière and the French National Institute for Agricultural Research (INRA) will use the arboretum to grow and research plants from around the world with the aim of selecting those species most adaptable to changes in the prevailing climatic conditions.

Redirection of 'Hot' Air from the Aisle

Temperatures in most data center hot aisles range from 80 to 115 degrees Fahrenheit (27 to 46 degrees Celsius), still fairly low temperatures for some heat recovery strategies. But we're seeing more facilities finding ways to capture and reuse this heat.

Telehouse West (United Kingdom)
Telehouse to Heat Homes at Docklands

Excess heat from servers at the new Telehouse Westdata center in the Docklands section of London will soon be used in nearby houses and businesses. The waste heat from the $180 million Telehouse colocation facility will be used in a district heat network, which is expected to produce up to nine megawatts of power for the local Dockland community.

IBM (Switzerland)
Data Center Used to Heat Swimming Pool

An IBM data center in Switzerland is being used to heat a nearby swimming pool. Hot air generated by the Uitikon center will flow through heat exchangers to warm water that will be pumped into the nearby community pool. IBM says the volume of heat thrown off by GIB-Services' data center is enough to warm 80 homes. Or one swimming pool, it would appear.

Academica (Finland)
Data Center Housed Under Cathedral Heats Homes in Finland

Treehugger.com reports that waste heat from a data center in Finland underneath Uspenski Cathedral (a popular tourist spot) will warm up water pipes and channel it to nearby homes for heating. The planned data center for information technology services firm Academica would be capable of providing enough heat to warm up 500 large private houses.

IBM and Syracuse University (New York)
Recycling Waste Heat in Nearby Buildings
A data center built by IBM and Syracuse University uses gas-powered micro-turbines to generate on-site power. During the winter, the 585 degree F (307 C) exhaust from the micro-turbines flows through heat exchangers to produce hot water, which is then piped to a nearby office building to be reused in the building's heating system.

Notre Dame University (Indiana)
Data Center Heats A Greenhouse
The Notre Dame Center for Research Computing has placed a rack of high-performance computing (HPC) nodes at a local municipal greenhouse, the South Bend Greenhouse and Botanical Garden, to help heat the flowers and plants in the facility.

Quebecor (Canada)
Companies Reuse Data Center Waste Heat to Improve Energy Efficiency

Quebecor channels excess heat produced by servers at its data center in Winnipeg, Canada to the nearby offices of a local newspaper. The company ran a second duct out of the exhaust plenum to the intake duct of the editorial office upstairs. The process was controlled by pneumatic baffles that open and close depending on readings of thermometers within the ducts.

Industry Thought Leaders Say Using Waste Heat is A Productive Practice

IBM's Elisabeth Stahl noted the benefits of using the data center as an energy producer in a recent Industry Perspectives column. "Through adopting this final level of the IT energy efficiency hierarchy, we can build a scalable, flexible, and green data center that is dynamic in its infrastructure," Stahl wrote. "Through this 'self-actualization' we can potentially save on energy costs; as a producer we might also even be able to make money as well."