

Greening the Dublin data center

In Ireland, Microsoft has built its largest data center outside the United States, using cutting-edge technology and an innovative approach to energy efficiency as part of an integrated strategy for environment sustainability.

Program Fast Facts

Situation: Data centers are vital for tomorrow's economy but are at risk of consuming high volumes of energy.

Solution: Microsoft built the Dublin data center using advanced energy efficient technology in accordance with its commitment to the EU Code of Conduct for Green Data Centers, which promotes best practices for energy efficiency and sustainability in the ICT sector.

Benefits:

- Reduced energy consumption
- Reduced CO2 emissions
- Increased capacity and performance.

The internet is developing at a tremendous pace as more businesses and people worldwide gain access to an ever greater range of online services including online office functionality, video and music downloads and more. Experts predict a continuous growth towards 'cloud computing', i.e., the provision of software plus services over the internet, which will provide companies with an opportunity to save money on ICT infrastructure, and software developers with an advanced interoperable platform to create innovative software for the future.

To support this projected growth, the software industry is building more data centers. This represents a challenge as data centers consume a significant amount of energy. For example, in the UK, data centers presently represent 3 percent of energy consumption and this is expected to double by 2020 if nothing changes, leading to more CO2 emissions and huge electricity bills for ICT companies that host data centers.

To tackle this challenge, Microsoft has adopted a strategy to dramatically improve its data centers' energy efficiency. In May 2009 the company signed the EU Code of Conduct for Green Data Centres, which includes a commitment to comply with European standards and best practices. Then in July 2009, Microsoft opened a new data center in Dublin, Ireland, that has a Power Use Effectiveness (PUE) of 1.25, on a scale where 1 is the optimal (the average in the industry is approximately 2.0 and Microsoft data centers globally presently have an average of 1.6). An important function for the Dublin data centre will be to host web conferencing tools like Microsoft's Office Live Meeting that enable customers to reduce business travel, and thereby reduce costs and emissions.



Moreover, Microsoft is working on additional methods to eliminate 50 percent of data centers' energy consumption (e.g. through reductions in artificial cooling, lighting and electricity transformers) and to reduce by 50 percent the need for new IT equipment.

The new Microsoft data center in Ireland already consumes approximately 50 percent less energy than a traditional data center of similar size and level of activity. In the Dublin facility, Microsoft has applied all of the expected and most of the optional best practices under the EU Code and will only employ artificial cooling on a few days per year. The data center is an officially recognized best practice by the European Commission meeting the requirements of the Sustainable Energy Europe Campaign (www.sustenergy.org) in contributing to the achievement of making a voluntary commitment to the EU energy policy goals in the field of energy efficiency. This is possible due to a range of innovations, one being the use of outside air to cool the data center at almost zero cost. This provides dramatic environmental savings as artificial cooling normally consumes approximately 38 percent of the facility's electricity consumption and 18 million liters of water per month. In addition, the latest generation of servers and 24/7 monitoring will help to create further energy savings.

Beyond the Dublin data center, Microsoft has already implemented, or is planning to implement, the majority of the EU Code's best practices in its data centers in Europe and across the globe. The company is also exploring the innovative use of shipping containers as flexible and portable housing for servers which provide 10 times the density for data centers and drive dramatic savings in power usage. Finally, Microsoft Research, the company's in-house research branch, is supporting these efforts by constantly looking for innovative ways to improve energy efficiency. For example, [the Green Project](#) looks for new algorithms that avoid unnecessary precision. In Microsoft's search engine Bing, a new algorithm gives more emphasis on the first pages of results than in the later pages, thus reducing the amount of energy needed to provide similar results. Another research project is [Everest](#), which allows data written to an overloaded volume to be temporarily off-loaded to underutilized storage resources in the data center, with an energy saving of up to 60 percent.

"We need to do three things," says Jean-Philippe Courtois, President of Microsoft International. "One, address the issues in our own industry; two, work to find technological answers to the environmental problems we are all facing today and tomorrow; and three, help individuals and organizations to change their behavior. Signing up to the EU Code of Conduct is just a small part of Microsoft's commitment to environmental sustainability, but with the projected growth of cloud computing it's important. We are also working with our network of partners, customers, environmental



groups, industry groups, and leading environmental scientists and academics to drive global action on climate change and share best practice.”

ABOUT THE EU CODE OF CONDUCT

The European Union Code of Conduct on Data Centers is a European wide voluntary initiative aiming to develop energy efficiency performance standards for data centers. Participants will commit to implementing a subset of expected best practice, to meeting minimum procurement standards and to annually reporting energy consumption. The Code of Conduct will be continuously developed and updated in consultation with stakeholders to follow technological development.

Microsoft Europe:

<http://www.microsoft.com/europe>

Environment at Microsoft:

<http://www.microsoft.com/environment/>

Video on Microsoft data centres:

http://www.microsoft.com/environment/videoplayer/standalone.aspx?initialVideo=environment_energyEfficientDataCenters

Microsoft Best Practices in data centres:

http://www.microsoft.com/environment/our_commitment/articles/datacenter_bp.aspx