Data Center Initiatives

Materiality Assessment Topic: Company energy use

Issue Summary

Data centers host Information and Communications Technology (ICT) systems and associated equipment. These facilities make modern communications and business operations possible, but they also use energy and water to maintain optimum conditions for the equipment inside.

Our Position

Our data centers serve as the "nerve centers" for AT&T's reliable services and network. Having large amounts of equipment in one facility requires that we maintain certain conditions in the rooms, such as temperature and humidity levels. We're actively working to reduce the energy and water used to maintain these conditions.

Our Action

We operate data centers and server farms/labs for a variety of uses:

- Enterprise Data Centers host computer equipment and technology for our core operations.
- Internet Data Centers host data and Internet service for our customers.
- Video Hub Offices host data and Internet service for our U-verse customers.
- Voice Messaging Centers host voicemail and data services for Internet and external customers.
- National Technology Centers host data and Internet service for our wireless customers.

Data centers have ecological and economic costs to operate. To combat each of these, we use sustainability criteria when designing and constructing data centers, managing data center facilities and deploying new ICT equipment.

DESIGN AND CONSTRUCTION

AT&T considers sustainability as one of the variables in the design and construction process of any new data center. In the process we consider sustainable design and LEED-qualifying solutions that affect water, energy and waste — i.e., economization, reduced impervious surfaces and natural low maintenance landscaping.

FACILITY MANAGEMENT

Improving the energy use of data centers represents a constant challenge and opportunity for our business. We are committed to pursuing energy efficiency at these facilities in order to provide a productive and efficient space for our ICT equipment. In 2012, we realized energy savings of 24 million kWh from projects that optimized facility operations at our data

centers.[1] This is the equivalent of the electricity use of 2,064 homes, according to the EPA Equivalencies Calculator.

Common projects included replacement of older major air conditioning equipment (chillers and compressors) with newer, more efficient equipment. Other projects included retrofitting of existing equipment with variable frequency drives (VFDs), and other similar enhancements to use existing equipment in a more efficient manner.

Here are just a few examples of the types of projects we identified and/or implemented in 2012:

- **Kansas City, MO Data Center**
  We installed a water-side economizer for a total energy savings 1,250,000 kWh annually. We also installed six new 20 HP VFDs on computer room air handler units for a total savings of 352,888 kWh per year.

- **Mission, KS Super Head End Office (SHO)**
  We installed 40 horsepower variable frequency drives on two main air handler units. We also installed new output dampers and control system optimizations. These led to total savings of 261,400 kWh per year.

- **Fairfield, CA Data Center**
  We replaced an older end-of-life chiller with a newer, more energy efficient machine. This led to total energy savings of 613,234 kWh per year.
- **Lynwood, WA Data Center**
  We conducted a major retrofit that included the installation of an air-side economizer with cycle capability. This led to total energy savings of 1,388,183 kWh per year.

In 2013, we will continue to look for opportunities to make our data center facilities more efficient and sustainable. We expect our planned projects for 2013 to yield similar or better energy savings than we saw in 2012.

ICT EQUIPMENT-RELATED EFFORTS

In addition to energy reductions in our facilities, we continue to focus on driving efficiency in the ICT equipment (servers, storage, network etc.) inside the building. Specifically, we focus on compression and virtualization of our equipment. Efforts to move new and existing physical services to virtual machines yielded annualized energy avoidance of 55.2 million kWh in 2012, equal to the electricity use of 4,876 homes annually, according to the EPA Equivalencies Calculator.

Demand for virtualization and demand for data center equipment rise in tandem. In 2012, our overall IT equipment energy growth increased by .04 percent, down from 7 percent in 2011, while our physical server and storage growth increased by 4 percent and 28 percent respectively. Virtual Servers made up the bulk of server growth in 2012 with a 40 percent increase. The avoidance of power using virtual servers resulted in a demand increase of approximately 200 kW instead of 4-6 MW for uninterruptable power supply.

In 2013, radical changes to platform solutions, greater adoption of virtualization and cloud services, along with new technology improvements in server cabinets, cooling

[1] These savings numbers are also included in the total facilities-related savings. Read more in our Energy Management issue brief.

methods and modular computing will enable even greater energy improvements.

THE GREEN GRID

We continued our work with a global consortium dedicated to advancing energy efficiency in data centers and business computing ecosystems. As a contributing leader, we serve on the End User Advisory Council and several technical and liaison subcommittees and supported the development and investigation of the Sustainable Site Selection Tools and Papers. The End User Advisory Council is chartered to:

- Serve as an advisory body to The Green Grid's board of directors by providing input and guidance on the general direction of the consortium's strategies.
- Actively participate in The Green Grid's technical committee activities.
- Help guide and shape the desired outcome of published materials, processes and recommendations from The Green Grid as one unified voice of the end-user community.
- Drive greater awareness of The Green Grid within the broad community of data center end users.