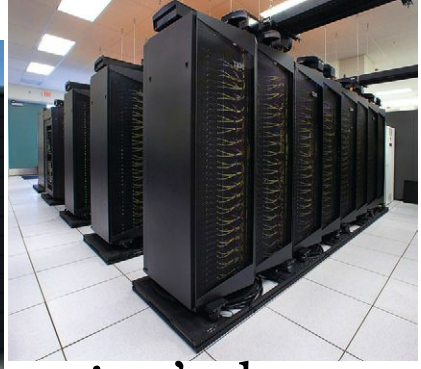

Powering cloud computing's data centers

BY JULIET EILPERIN

To most people, the cloud is an abstract warehouse in the sky where we store our photos, documents and other key bits of information with a click of a button. But the technology that keeps the cloud running—data centers and mobile telecommunications networks, operating 24 hours a day—requires electricity, making it a target for environmentalists hoping to curb greenhouse gas emissions.

All but one of the nation's major IT companies still rely on fossil-fuel energy to power more than half their cloud operations, according to a report recently issued by the advocacy group Greenpeace. Amazon.com Web Services, Apple, Oracle and Salesforce rank toward the bottom for their carbon footprints. Dell is the only company that relies on fossil fuels for less than half of its electricity demands.

Virginia hosts some of the major servers, with more than a dozen new data centers expected to be built in the next two years.

Although it is hard to pinpoint how much energy cloud computing uses each year, the IT sector estimated in 2008 that it represented two percent of the world's greenhouse gas emissions. In 2007, data centers and mobile communications used 623 billion kilowatt hours of electricity; if the industry were a country, it would rank fifth in the world in terms of electricity demand, behind the United States, China, Russia and Japan.

"Data centers and the cloud would be an environmental win if we build them in the right way and connect them in the right way," Greenpeace IT analyst Gary Cook said in an interview. "If we just connect them to traditional sources of fossil-fuel energy, that becomes a real train wreck."

More than half of U.S. Internet traffic passes through Northern Virginia, according to Thomas F. Farrell II, chief executive of Dominion Resources, a major utility pipeline and power company.

The state hosts nearly three quarters of the servers for the East Coast portion of Amazon Web Services, known as EC2 Cloud Hosting, as well as a major Microsoft facility.

The major supplier for these data centers is Dominion Virginia Power, which gets 38 percent of its electricity from coal, 17 percent from gas, 42 percent from nuclear and 3 percent from renewables.

Farrell said he expects an additional 14 data centers to be built over the next two years. Estimates of the energy use of each data center vary widely, running from the equivalent of 6,000 to 8,000 homes to much higher numbers. Dominion estimates that data centers will account for 63 percent of the state's growth in electricity demand over the next five years.

Dominion Virginia Power is in the process of closing or converting seven coal-fired power plants in Virginia, company spokesman David Botkins noted in an e-mail.

"We have one of the cleanest-generating fleets in the nation, including one of the best records among our peers in terms of carbon intensity," Botkins said.

Greenpeace spokesman David Pomerantz noted that, as increasingly important customers for the nation's utilities, IT firms are well positioned to lobby politicians and company executives alike to boost renewable energy supplies. "They hold a ton of leverage," he said.

Some IT companies are already using this leverage, either by choosing to have data centers near renewable sources, investing directly in renewable energy or pushing for legislative changes on the state level.

Last month, Utah enacted legislation—at the urging of Internet giants ebay, Google, Oracle and other members of a group called Data Center Pulse—to let non-utility energy customers buy and transmit power directly from renewable energy developers. The measure, which will take effect this summer, removes a roadblock ebay encountered as it built its first data center in South Jordan, Utah, in an effort to tap cleaner energy supplies.

Dean Nelson, vice president for ebay's global foundation services, said it took more than a year to make the necessary policy change. Ninety-four percent of Utah's electricity generation comes from coal; ebay gets 11 percent of its electricity from renewables, and Nelson said the company hopes to increase that amount as it consolidates data center operations in Utah, Arizona, and Nevada.

"That's why this is so critical. It's cleaning it up in our own back yard," Nelson said, adding that in the next two months the company will send out requests for proposals from renewable-energy vendors.

Google, by contrast, has devoted significant resources into investing directly into renewable energy projects, including one aimed at building a massive transmission line for offshore wind energy along the Atlantic Coast and what promises to become the world's largest wind farm, located in Oregon. These investments total more than $915 million so far; the company also boasts data centers that are 50 percent more efficient than the industry average.

[*Based on a Washington Post article*]