Greenwire
THE LEADER IN ENERGY & ENVIRONMENTAL POLICY NEWS

Published: Thursday, February 4, 2016

The nation's largest information technology and computing companies could be underestimating the carbon footprints of their data centers by up to 25 percent, according to an analysis today.

The study by Lux Research found that big corporations relying on U.S. EPA data are producing estimates of their energy mix that do not fully capture their carbon dioxide emissions. The authors devised an analytical tool using data from the U.S. Energy Information Administration that they say more accurately captures the carbon footprints of data centers operated by companies like Google, Amazon, Facebook and Apple.

"Our team of data scientists analyzed the North American electric grid, improving the accuracy of carbon reporting by a factor of 80," said Ory Zik, vice president of analytics at Lux. "The results show that many sites are far more reliant on coal than reported -- notably, they include many large data centers."

Zik said the team hoped to encourage big computing companies to use their data capabilities to embark on their own detailed analyses of their carbon footprints. He said another goal was to improve federal data on the mix of sources generating electricity.

Although acknowledging that public data is somewhat scarce, the Lux report found that at least some leading computing companies rely on EPA's Emissions & Generation Resource Integrated Database, or eGRID, to measure their carbon dioxide emissions. But Lux said the data is outdated -- the latest data is from 2012 -- and not specific enough to get a complete picture of where energy in different parts of the country is being generated.

Using monthly data from EIA, Lux divided the nation into 134 regions, compared with the 20 used in the eGRID data. The researchers then analyzed the grid to create a tool that estimates the mix of energy sources in those regions.

The tool was first published in October in the journal *Environmental Science & Technology*. Today's new paper applies the method to study the energy use of data centers.

"We've chosen to start with data centers because they are huge energy consumers and they have no excuse to say we don't have data capabilities," Zik said. "If we can normalize the data, surely so can Google and Apple."

According to the analysis, four of Google's big data centers in the United States likely rely more on coal than the eGRID data portrays, meaning emissions from the centers are likely 42,000 metric tons of carbon dioxide equivalent higher than what the company says.

The analysis also found that the EPA data set likely underestimates the emissions from Amazon's data centers by about 85,000 metric tons of carbon dioxide equivalent per year. The Lux tool based on EIA data found that 23 of the company's cloud services data centers are connected to the Virginia electricity grid, which is more reliant on coal than is portrayed.

Amazon has countered claims that its data centers are not climate friendly, arguing that analyses that look solely at energy mix are missing key information about energy efficiency and resource use.

According to Amazon, customers who use Amazon's cloud services are cutting carbon dioxide emissions by 88 percent compared with using their own data centers.

"Fewer servers and powering them more efficiently is at least as important to reducing the carbon impact of a company's data center as its power mix," Amazon says.

Zik credited computing companies for taking steps to reduce their energy consumption within their walls but said information about where their electricity is coming from remains a "blind spot."

"The data sector industry has been optimizing their electricity consumption for years," he said. "The question is where electricity comes from. That's the new question."