

The environmental cost of data centers is substantial. Making them energy-efficient only solves half the problem

April 4 2023, by Tiola Allain



Credit: AI-generated image ([disclaimer](#))

In 2022, Indonesia hosted around [215 million internet users](#), who spent an average of [more than eight hours](#) on the internet every day.

This includes activities with lower [data](#) traffic such as using ride-hailing

apps and sending emails, to heavier ones like video streaming and big data processing.

Data and internet have made people's lives easier, but we often dismiss their environmental cost. To store and manage [digital information](#), we need massive spaces called [data centers](#) that uses a lot of [energy](#) and water to control its temperature.

Humans' increasing dependence on data has caused a growing demand for data centers.

Indonesia currently houses [94 data centers](#) with leading names including China's Alibaba Cloud, the United States' Google Cloud and state-owned-enterprise PT Telkom Indonesia. They have a combined capacity of 727.1 megawatts.

As an illustration, a small one megawatt data center requires electricity to power 1,000 houses and consumes around 26 million liters of water per year

The number is expected to rise by about [20% each year](#) due to the country's growing digital activity.

The Indonesian government plans on constructing [four National Data Centers by 2026](#)—each boasting a capacity of up to 40 megawatts.

Additionally, demand for data centers may shift to Indonesia from Singapore—[the region's digital powerhouse](#)—which is currently limiting further growth of data centers due to environmental sustainability concerns.

Indonesia's capital Jakarta is now one of the [fastest-growing data center hubs](#) in the Asia Pacific, second only to Melbourne, Australia.

It is important for these data centers to adopt [sustainable practices](#) to reduce their [environmental impact](#).

So, how can we create a digital regime that is more environmentally sustainable?

Make them transparent and efficient

To control and minimize the environmental cost of growing data centers, the Indonesian government and industry players need to create plans for more sustainable methods of operation and reporting.

Currently, the government only imposes [a mandatory reporting program](#) on energy consumption for large energy consumers of about 70 gigawatt hours per year.

However, [there are no data centers](#) that meet this threshold. A hyperscale data center consumes around [20–50 megawatt hours annually](#), far below the 70 gigawatt hours threshold. So reports on actual energy consumption from individual data centers have been unknown.

To ensure transparency, data center operators—regardless of how much energy they consume—should collaborate to systematically report energy consumption.

The public must also have access to the sector's annual energy usage for greater accountability.

On top of this, the government should require the electricity usage of data centers to be efficient.

In Singapore, for instance, [data centers are required](#) to have a "power usage effectiveness" of 1.3 (the closer they are to 1, the more efficient a

center is).

The rule pushes operators to design and operate their data centers in the most energy-efficient way possible. This includes the usage of modern energy-efficient machines, which will significantly cut [energy consumption](#) and save costs in the long run.

The government should also encourage data center operators to adopt more environmentally-sustainable energy sources.

Currently, several data centers in Indonesia have received Renewable Energy Certificates to prove their commitment to using [renewable energy](#) to power up their facilities from Indonesia's state-owned electricity company, PLN.

In the future, the government could encourage more companies to adopt a similar approach, for example by giving tax incentives for industry players using renewable energy.

In Europe, a group of data center operators, including the US' Amazon Web Services and Google, have committed to buy enough renewable energy to match [75% of their total energy consumption by 2025 and 100% by 2030](#).

Behavioral adjustment in digital space is needed

Making sure data centers run as efficiently as possible is still only half of the battle.

Emissions from data centers are not the only concern. There are also negative environmental impacts from the advanced use of data, many of which are difficult to measure.

For instance, there are environmental costs from increased consumerism due to the ability of big data and algorithms to flood users with the "right" advertisements, and to keep users engaged in social media and e-commerce platforms.

Efficient data centers may become susceptible to [the "Jevons Paradox,"](#) where their optimized operations could encourage increased growth and resource consumption in the long term.

At the end of the day, technological innovations and efficiency alone cannot achieve sustainability—it has to be accompanied by a continuous behavioral adjustment in the digital space. Educating Indonesian users on the tangible impacts of their digital activities is an essential step.

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