CASLE
CENTRO DE AVALIAÇÃO DE SUFICIÊNCIA EM LÍNGUA ESTRANGEIRA

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LÍNGUA INGLESA

TEXTO: Five ways data centers endanger their local communities and the country as a whole

Every internet search, streamed video and AI-generated response depends on a data center somewhere. Driven by rapid growth in artificial intelligence, cloud computing and cryptocurrency, data centers have become the backbone of the modern digital economy. But though their key role is in enabling virtual and remote experiences, data centers are physical buildings in real communities around the nation and the globe.

The United States hosts more than 4,000 data centers – more than any other country. The U.S. Department of Energy expects that, taken together, all U.S. data centers will consume as much as 12% of all U.S. electricity by 2028. In 2023, data centers consumed about 4.4% of total U.S. electricity – roughly 176 terawatt-hours.

In the U.S., Virginia has more data centers than any other state – over 600, two-thirds of which are in the northern Virginia suburbs of Washington, D.C. In 2023, the state's data centers consumed about 26% of Virginia's total electricity supply – a higher share than in any other state.

We study science communication, climate science and public health, so we wanted to understand how data centers in Virginia affect the people who live near them and the broader public. We found that the data centers that already exist affect nearby residents and the nation as a whole in five main areas: air quality, water quality, noise levels, land use and energy costs.

Air pollution

Data centers generally operate 24/7 and consume enormous amounts of electricity, which must be generated somewhere – either near the data center or farther away. When fossil fuels are burned to generate that power, they emit a wide range of air pollutants, including those linked to lung disease, cardiovascular disease, stroke and neurological conditions. They also emit heat-trapping pollution that causes global warming and climate change, which, in turn, worsens air pollution further.

Generating power for U.S. data centers in 2023 emitted the equivalent of 2.2% of the nation's greenhouse gas emissions. Other air pollutants emitted from fossil-fuel combustion are associated with increased risk of ADHD and autism in children and risks of Parkinson's and Alzheimer's diseases in older adults.

Unless the energy powering data centers comes from clean energy sources, such as solar, wind or geothermal, generating that electricity also pollutes the air. People who live near fossil-fuel burning power plants, whether in communities that also host data centers or in distant states, are exposed to air pollution. And during electrical outages, on-site diesel generators kick in, releasing large amounts of air pollution that can harm data center employees and nearby residents alike.

Water consumption and pollution

Data centers require vast quantities of water to cool their servers. Globally, they are projected to consume between 4.2 billion and 6.6 billion cubic meters of water annually by 2027. In the United States, data centers already rank among the top 10 industrial water users.

In northern Virginia, data center water use has risen sharply. In Loudoun County alone, just northwest of D.C., potable water use by data centers more than doubled between 2019 and 2023, while facilities across northern Virginia consumed nearly 2 billion gallons of water in 2023.

This demand can strain local rivers, aquifers and municipal water systems, even in regions like the mid-Atlantic that are not usually prone to drought, but especially in regions like the U.S. Southwest that face persistent droughts.

Noise pollution

Data centers' continuous operation means that cooling systems, including air chillers and cooling fans, generate a persistent humming sound around the clock – as do any generators that are in use to provide power.

In northern Virginia, some residents have complained about an industrial-scale "drone" or "hum." Measurements at the data centers that were the subject of complaints found noise levels were between 40 and 59 decibels on residential property.

Those noise levels are quieter than a conversation with someone 3 feet away and not loud enough to damage people's hearing or violate local noise ordinances. But they are close to levels the EPA says reduce people's ability to work, sleep and exercise. Some people have complained that data center noise has given them trouble sleeping and concentrating, and some have said they avoid using their homes' outdoor spaces, where the noise is louder.

Land use and community well-being

Data center expansion often targets land near green spaces, agricultural areas or rural communities where developers can secure affordable land with access to existing electricity supplies.

Converting green space into industrial facilities can diminish health benefits associated with being in and near natural environments, including opportunities for physical activity and improved mental well-being.

In Virginia, residents living near data center construction have reported increased exposure to truck traffic and diesel exhaust, which can contribute to respiratory and cardiovascular health risks, especially in children and older adults. While these effects are typical of large construction projects, they can be amplified when several data centers are clustered together.

In places like Prince William County, Virginia, developers have proposed data centers on roughly 2,400 acres of undeveloped land in the Rural Crescent, an area designated by the county's planners to remain relatively undeveloped. Those data centers could transform open space and rural farmland into industrial zones, disrupting communities with long-standing ties to the land.

Rising energy costs

As data centers increase electricity demand, they put upward pressure on energy prices across the grid. A 2024 Virginia legislative report found that the state's typical residential electricity bill could rise by $14 to $37 per month by 2040 because of grid strain tied to data center growth – a 9% to 25% increase over current average bills, and a figure that does not factor in potential inflation.

These higher costs are paid by all consumers, but they place a greater burden on families that are most economically distressed, who also tend to have more health problems. Lower-income families spend a higher share of their budget on electricity, and when bills rise, the consequences can include reduced access to adequate heating and cooling, increased risks of heat-related illness and cold-related cardiovascular stress, as well as difficult choices between paying for energy and food or healthcare.

What can be done

Many of these health harms can be mitigated through better planning and design. Increasing the share of renewable energy used to power data centers would help reduce air pollution and associated health harms.

Using recycled water in targeted systems that cool individual server rows or racks rather than whole buildings can significantly reduce cooling energy demand, with some studies estimating reductions of up to 29%. On noise, a Leesburg, Virginia, data center reduced low-frequency tonal noise by reengineering its fan mounts. And on energy costs, requiring large-scale data centers to cover more of the grid costs they create could help protect residential customers from higher electricity bills.

The world's digital infrastructure runs through data centers, and that is not changing. We believe that expanding this infrastructure without protecting the health of surrounding communities is an unacceptable option.

Source:https://theconversation.com/5-ways-data-centers-endanger-their-local-communities-and-the-country-as-a-whole-282348

QUESTÃO 01 (1,0)

A afirmação de que os data centers são "the backbone of the modern digital economy", apesar de sua função estar associada a experiências "virtual and remote", permite inferir que o texto pretende, principalmente,

(A) demonstrar que a economia digital tornou desnecessária a existência de infraestruturas físicas especializadas.
(B)enfatizar o contraste entre a aparente virtualidade dos serviços digitais e a materialidade de suas consequências ambientais e sociais.
(C) defender que os impactos ambientais dos data centers são inevitáveis porque a sociedade depende cada vez mais da tecnologia.
(D) argumentar que os data centers deveriam ser transferidos para regiões afastadas dos grandes centros urbanos.

QUESTÃO 02 (1,0)

Analisando os dados numéricos e a projeção de consumo de energia dos data centers nos EUA (4,4% em 2023 para até 12% em 2028), infere-se que:

(A)O aumento da demanda energética será acompanhado por uma redução proporcional dos custos para os consumidores residenciais.
(B)A Virgínia deixará de ser o principal polo de data centers devido ao esgotamento de suas reservas hídricas.
(C)As fontes de energia renovável cobrirão totalmente a demanda adicional prevista até o ano de 2028.
(D)O consumo proporcional de eletricidade pelos data centers nos EUA deve quase triplicar em um intervalo de cinco anos.

QUESTÃO 03 (1,0)

De acordo com o texto, que doenças podem ocorrer em decorrência da poluição do ar causada pela geração de energia a partir de combustíveis fósseis?

(A)Doenças pulmonares, derrames cerebrais, e câncer.
(B)Doenças pulmonares, oculares, cardíacas e Parkinson.
(C)Doenças cardiovasculares, neurológicas, pulmonares e AVC.
(D)Doenças dermatológicas, neurológicas, oncológicas e cardíacas.

QUESTÃO 04 (1,0)

Qual é a tradução correta de acordo com o contexto para a frase "...near fossil-fuel burning power plants..." no sétimo parágrafo?

(A)... quase o fóssil combustível queimando o poder das plantas.
(B)... perto do combustível fóssil com o poder das plantas queimando.
(C)... próximo do combustível fóssil que queima usinas de força.
(D)... perto de usinas de energia que queimam combustíveis fósseis.

QUESTÃO 05 (1,0)

Que alternativa abaixo é incorreta em relação ao que é dito sobre o barulho emitido pelos data centers?

(A)O sistema de resfriamento dos data centers emite um zumbido constante.
(B)O barulho emitido é equivalente a uma conversa com uma pessoa a menos de um metro de distância.
(C)O barulho emitido está próximo dos níveis que reduzem a capacidade de trabalho, sono e exercício físico.
(D)Algumas pessoas reclamam que o barulho atrapalha o sono e a concentração.

QUESTÃO 06 (1,0)

No que diz respeito ao uso do solo e ao planejamento urbano no condado de Prince William, a instalação de data centers representa:

(A)Uma ameaça de conversão de áreas rurais e abertas preservadas em zonas de desenvolvimento e especulação industrial.
(B)Um modelo sustentável que proíbe o tráfego de caminhões e geradores a diesel durante a fase de construção.
(C)Uma oportunidade de reflorestamento e recuperação de habitats degradados pela atividade agrícola intensiva.
(D)Um projeto consensual aprovado sem ressalvas pela comunidade local devido à geração de novos empregos ecológicos.

QUESTÃO 07 (1,0)

Na seção "What can be done", os autores apresentam diferentes medidas: uso de fontes renováveis, utilização de água reciclada, alterações nos sistemas de ventilação e maior participação dos data centers nos custos da rede elétrica. A diversidade dessas propostas permite concluir que, segundo o texto,

(A)os impactos dos data centers são inevitáveis e podem ser resolvidos apenas pela interrupção de sua expansão.
(B)a principal solução para os problemas ambientais dos data centers consiste exclusivamente na substituição dos combustíveis fósseis por energia solar
(C). os diferentes impactos exigem estratégias específicas de planejamento, projeto e distribuição de custos, e não uma única solução tecnológica.

(D) medidas destinadas à redução dos impactos ambientais são incompatíveis com a expansão da infraestrutura digital.

QUESTÃO 08 (1,0)

A partir da leitura integral do texto, entende-se que a intenção central dos autores é:

(A) evidenciar os custos ambientais e comunitários dos data centers, defendendo o crescimento responsável e com proteção à saúde pública.
(B) defender a migração de todas as infraestruturas digitais norte-americanas para países em desenvolvimento.
(C) demonstrar a inviabilidade financeira e operacional do uso de fontes renováveis de energia na computação.
(D) provar que a inteligência artificial e a computação em nuvem trazem mais prejuízos do que benefícios para a sociedade.

QUESTÃO 09 (1,0)

No trecho “Unless the energy powering data centers comes from clean energy sources, such as solar, wind or geothermal, generating that electricity also pollutes the air”, a palavra “Unless” estabelece uma relação de sentido equivalente a

(A) “although”, introduzindo uma ideia de concessão.
(B) “because”, introduzindo uma ideia de causa.
(C) “if ... not”, introduzindo uma condição negativa.
(D) “while”, introduzindo uma ideia de simultaneidade.

QUESTÃO 10 (1,0)

No trecho “These higher costs are paid by all consumers, but they place a greater burden on families that are most economically distressed”, o pronome “they” estabelece uma relação de referência que é fundamental para a compreensão do argumento. Nesse contexto, “they” refere-se a

(A) altos custos.
(B) todos os consumidores.
(C) famílias.
(D) lugares.

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