RESPONSIBLE DATA CENTER DEVELOPMENT

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WHY IT MATTERS

Virginia is home to the largest concentration of **data centers** in the world, with a combined power consumption capacity about four times greater than the next closest American markets, Dallas and Silicon Valley.[1] This massive industry is continuing to grow rapidly, requiring huge amounts of energy, land, and water to operate, resulting in widespread community impacts.

One data center can use as much energy as thousands of households; in fact, a large "hyperscale" data center can consume over 100 **megawatt (MW)** of power,[2] which equates to the power consumed by approximately 80,000 households. As of early 2023, data centers make up 21% of Dominion Energy's power load in Virginia,[3] with **PJM**'s projections indicating a doubling of the state's peak electricity demand through 2038.[4]

While Dominion has a long history of predicting more growth than occurs, electricity consumption has increased significantly over the past four years[5] and their high projections[6] and "electric service agreements"[7] with the data center industry are being used to justify dozens of new substations and expensive transmission projects to serve data center load requests throughout the state[8,9] as well as new polluting gas facilities that would increase all ratepayers' electric bills significantly despite the need being driven almost entirely by data centers.

Data centers can also have significant local air quality impacts. Data centers around Virginia rely on diesel generators as a backup electricity source. In Northern Virginia, data centers have obtained air permits for over 4,000 diesel generators with a combined capacity of over 11GW of power[10,11]–more than all of Dominion's entire gas generator fleet. There is no monitoring of the impacts on air quality from periodic testing of these generators which is usually done monthly[12] or any analysis on the impact if there were a transmission level outage.

Data center campuses are getting larger, requiring massive amounts of land and water. Projects over 1,000 acres have been proposed directly adjacent to national and state parks, threatening the integrity of Virginia's landscapes and wildlife corridors. Despite prioritizing **reclaimed water** for data center cooling in the past, Loudoun County's data center potable water consumption is now higher, having increased by 250% in the last 4 years, totaling 899 million gallons in 2023.[13] Data center development expectations in other parts of the state are also triggering additional surface water withdrawal requests.[14]

The nexus of land, energy, water, and ratepayer impacts represents a complex challenge–and immense opportunity–to protect Virginia's environmental resources.

CURRENT LANDSCAPE

For years, statewide tax incentives and active recruitment by both state and local economic development offices have encouraged data centers to continue siting in Northern Virginia, despite its existing heavy concentration of data centers.[15] Coupled with skyrocketing demand following the 2020 pandemic, Northern Virginia as well as other markets throughout the state are experiencing exponential growth. Unfortunately, there has been no proactive planning or adjustment to the state tax incentives to address this shift and the need to protect the resources of the state. Without sufficient regional or statewide oversight, localities continue to approve more facilities without considering the statewide and nationwide impacts on the electric grid, ratepayers, water supply, national and state parks, or air pollution.

The concentrated data center growth in Northern Virginia has also resulted in a congested grid that is already in need of significant transmission projects. PJM, for example, recently approved a $5B portfolio of transmission projects that would expand grid connections from West Virginia, Pennsylvania, and Maryland to the Northern Virginia data center market. One of the major projects in that portfolio is the Mid-Atlantic Resiliency Link traversing from data center alley out to West Virginia where the power generation is primarily coal and gas-fired power plants.[16]

In December 2023, the Joint Legislative Audit & Review Commission (JLARC) passed a resolution[17] to study data centers and better understand these wide-ranging impacts. That study remains ongoing, and it should help guide decision-makers. However, the energy costs[18,19] and many of the environmental impacts of data centers are already well known.

OPPORTUNITIES

It is time for the state to play a larger role in planning for and mitigating the impacts of this explosive industry. As one of the largest industries in the state, data centers require greater transparency and oversight to ensure that their development is happening in a sustainable manner that benefits communities without harming our health and natural resources.

The current review process is inadequate at both the local and state level. Localities, for example, are making decisions about large data center projects with little to no information about the significant ramifications on the state's electric grid and ratepayers, water supplies, air quality, or carbon emissions. During the local approval process, localities should be required to consider information about the potential grid impacts of a data center proposal, including energy demand, required infrastructure, and interconnection conditions. For particularly large data center projects, this review could happen at the state level to help ensure continued grid reliability and prevent excessively high costs from falling to the ratepayers. In addition, a state-level review could evaluate impacts on shared regional resources or state goals not usually in the localities' purview to address, such as the protection of national and state parks, water supply, and air quality.

In addition, as grid infrastructure costs add up, Virginia needs to be sure that the SCC and other agencies have the

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appropriate tools to ensure that data center companies are paying their fair share of transmission, distribution, and generation costs.

A final important opportunity is to revisit the state's tax incentives. The current approach continues to attract development but has failed to incentivize data center companies to mitigate environmental and community impacts. A revamped tax incentive could encourage clean energy commitments, energy efficiency standards, innovative demand shifting and peak shaving that reduce facility's energy consumption, diesel generators phase-out, efficient cooling w ater systems, and buffers from parks, homes, schools, and nearby communities.

TOP TAKEAWAYS

Local review of data center developments is inadequate to evaluate widespread impacts on the grid, electric ratepayers, water resources, parks, air quality, and emissions, and a state review process is necessary.

With data centers representing the driving force behind significant load growth projections, it is important to ensure the industry is paying its fair share and costs aren't falling on all utility ratepayers.

Virginia already has the largest data center market in the world, so state incentives should be tightened to encourage data center proposals that are more sustainable.

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