1000 FRIENDS of FLORIDA

Special Report

Potential Impacts of Data Center Development on Florida Communities:

Issues for State and Local Policymakers

By 1000 Friends of Florida

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Data Center Development

Introduction



Data centers are facilities for the storage and processing of the vast amount of electronic data now required by American society's use of electronic media and computing capacity for a wide range of purposes by corporations, government and individual consumers. Data centers are expanding rapidly at locations across the country — driven particularly by cloud storage of data and by the rapid growth of Artificial Intelligence (AI) for multiple applications. While Florida is not seen as much of a national hot spot for data center growth like Virginia and Texas, there are already an estimated 120 data centers in Florida and substantial investment in data centers is likely with the attendant impacts described in this paper.

Physically, data centers are buildings filled with servers and computers linked to outside users operating 24 hours a day. They include systems to cool the equipment, which produces significant amounts of heat from its operation. Data centers require massive amounts of electricity and include banks of large generators as backup in case of power failures or shortages of power. Data centers are expensive to construct and equip (and represent substantial property value), but when operational, they employ relatively few people and fewer still highly paid workers.

The Impacts of Data Centers

Energy Demand

Data centers require vast amounts of electrical energy to power servers and cooling systems, according to the PEW Research Center, which has sourced data from the International Energy Agency. A typical AI-focused data center consumes as much electricity as 100,000 households. The larger data centers now under construction are expected to use 20 times as much. This translates into increasing overall energy demand, shown on the graph on the next page.

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Data Center Development

The Impacts of Data Centers *continued*

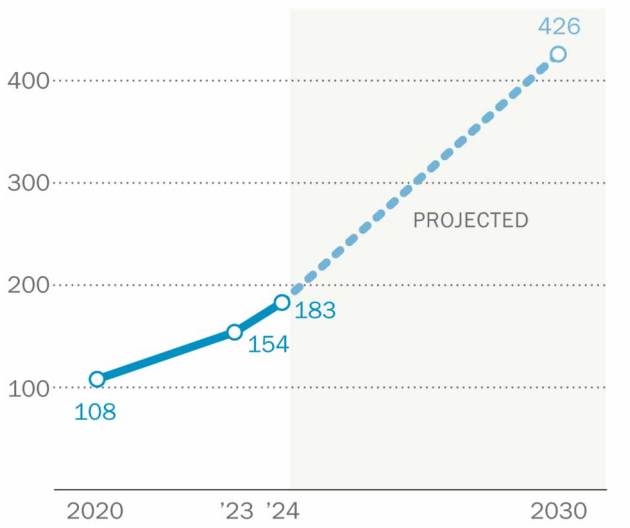
Existing electrical generating capacity is usually not sufficient to power these facilities, so new generating sources need to be constructed adjacent to sites, or at other locations requiring new transmission lines and substations. In some cases renewable energy sources, particularly solar arrays, are being constructed to supply some of the needed power, but because data centers require power 24 hours a day, very large other energy sources are generally needed.

Energy demand for data centers has raised several important issues:

- Because of the speed at which data centers are being developed, new generating facilities cannot come online fast enough to supply the needed power, so old, polluting, and inefficient fossil-fuel power plants that were scheduled to be retired are being kept in operation.
- Some companies and developers have made commitments for the use of renewable energy to power data centers and co-location of solar power generation is taking place, particularly in the West. While solar power has no emissions, it changes land use, including displacing active farm and ranch land.
- Gas-fired generating plants are the easiest to construct, but while they have lower conventional and greenhouse gas emissions than coal plants, they still represent a net increase in emissions. They also require new gas pipelines and electricity transmissions corridors.
- There is much talk of small modular nuclear generating plants and restarting closed conventional nuclear plants, but these energy sources will take time to get online and present their own land-use issues.
- A major concern is who pays for the additional electrical and generating and transmission capacity. The article, "Extracting Profits from the Public: How Utility Ratepayers Are Paying for Big Tech Power" from the Environmental Energy and Law Program at Harvard Law School (March, 2015) makes the case that in some instances power companies and data center developers have entered into agreements that allocate some of the costs of additional generating and transmission capacity to other ratepayers, thus increasing electric rates for all. States are now passing legislation to preclude this from happening. Policies and legislation addressing this issue have been proposed in Florida.

Electricity Consumption at U.S. Data Centers is Expected to More Than Double by 2030

Total electricity consumption by U.S. data centers (terawatt-hours)



Note: 2030 projection is based on IEA's "base case" scenario, which assumes current industry forecasts and regulatory conditions persist. Source: International Energy Agency, "Energy and AI," April 2025. PEW RESEARCH CENTER

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The Impacts of Data Centers *continued*

Water Use

The operation of the servers and other equipment within data centers produces substantial heat, requiring the buildings and the equipment to be cooled. While there is ongoing research and development to invent and perfect new, more-efficient cooling systems, most data centers now use evaporative cooling for this purpose. This means that most of the water used for cooling is lost to the air and cannot be recirculated. A study by the Houston Advanced Research Center (HARC) and the University of Houston found that data centers in Texas will use 49 billion gallons of water in 2025, and as much as 399 billion gallons in 2030. That would be equivalent to drawing down the largest reservoir in the US — 157,000-acre Lake Mead — by more than 16 feet in a year.

Given that local groundwater is the primary source of water in Florida and that some areas of Florida are already withdrawing too much water to be sustainable under drought conditions, water use is likely a major factor in data-center siting and management in this state. Yes, recycled water can be used for cooling, but it, too, will be lost in the most widely used cooling systems.

There are air-cooling systems that can be used for data systems, and, as noted above, new cooling systems are being explored. However, air cooling and some other approaches use more power. Thus, there is a tradeoff between water use and the impacts of power demands discussed above.

Direct Air Quality

The primary direct air-quality issue from data centers is when their diesel generators are in operation. This is an intermittent problem not as significant as the larger air-quality issues from base electric generation, but generator noise and emissions can be a concern for adjacent residential neighborhoods.

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The Impacts of Data Centers *continued*

Land Use and Quality of Life

Data centers are large, windowless buildings that are strongly fenced for security purposes, are brightly illuminated, and include larger emergency power generators that are noisy and that produce air pollution when in use. These buildings employ comparatively few people. Large electric substations are likely a related land use. The overall land-use effect is one of an industrial dead zone that in scale and character may be incompatible with other land uses like housing and commercial activity. Because data centers tend to cluster in certain locations (particularly at the intersection of electric and fiber-optic transmission lines), this can produce large areas of fenced-off industrial land uses. Operation of the on-site generators can produce noise sufficient to disturb adjacent land users. In some locations, data centers displace farming on suitable soils and wildlife habitat. These land-use impacts have become controversial in rural areas and adjacent to minority communities.

Property Taxes

Because of the value of their buildings and equipment, data centers have the potential to enhance local tax bases, but the literature suggests that a number of states and municipalities have made tax-reduction agreements with developers to attract data centers that negate those potential tax benefits. A study by the Ford School of Science, Technology and Public Policy at the University of Michigan suggests that many such tax breaks are net losers for states and municipalities — that is, the overall economic benefits to the community are worth less than the benefits afforded the corporations from the tax reductions.

Traffic

Because data centers have relatively few employees for the size of the facilities, automobile traffic is not an issue with their siting and construction.

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Addressing Impacts

As data center development has accelerated, state and local governments have taken steps to address data-center impacts. Various states including Florida, as noted above, have new or pending policies pertaining to data centers and their electric-power requirements.

The highest concentration of data centers in the U.S. is in northern Virginia outside Washington, D.C. The Piedmont Environmental Council (PEC), a large non-profit conservation and regional planning organization, has been deeply involved in the data-center policy in that region.

Among PEC's suggestions is the need to integrate planning for data centers with comprehensive planning for the communities in which they are to be located. In Florida, while regulating electrical utilities is a state responsibility, planners at the local level are best positioned to address land-use issues presented by data centers, with the support of regional water management districts and relevant state agencies.

Questions for planners to consider in evaluating applications to site data centers:

Community Compatibility & Equity

- How close would the data center be to sensitive public facilities, such as schools, parks, wildlife trails, elder-care centers and hospitals?
- Would the data center be located near low-income communities?
- What noise impacts would cooling systems and generators create for any neighboring communities or future development?
- What limits on lighting for industrial-scale data centers would be needed to curtail negative impacts on the environment and on the quality of life of nearby communities?
- What buffers and design requirements would be needed to make a data center more compatible with its neighbors?
- What limits on height and intensity would be needed to make a data center more compatible with neighboring land uses?

Land-Use Compatibility & Growth Implications

- What other land uses might be incompatible with a data center — e.g., commercial, tourism?
- If located near undeveloped land, would the data center spur price increases for land that inhibit future residential or mixed-use development in the region?
- Would the data center and the electrical infrastructure supporting it consume productive agricultural land?
- What would be the impacts on neighboring land use of the electrical infrastructure needed to support a data center?
- What other kinds of development would be attracted by that electrical infrastructure?

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Addressing Impacts *continued*

Natural Resources & Conservation

- Would the data center be located in or near the Florida Wildlife Corridor, and how could it impact efforts to conserve and protect the Corridor?
- Would the proposed data center hinder landscape connectivity due to its size, fencing or security measures?
- How would impacts to wildlife habitat and conservation lands be avoided, minimized, or mitigated?

Water Supply & Wastewater

- What would be the projected water demand for cooling, and how large a share of the local water supply would it consume?
- Would recycled water be available? (These are issues to be explored with water management districts.)
- What would be the impact on local wastewater treatment capacity?

Energy Infrastructure & Environmental Impacts

- What would be the land-use and environmental impacts of the electrical infrastructure required to support the data center?
- What would be the potential environmental impacts of backup generators?
- Would requirements for low-sulfur fuel, filters, emissions limits and air-quality monitoring be needed?

Public Safety & Emergency Services

- Would local fire departments be trained and equipped in responding to risks associated with lithium batteries, diesel generators, on-site fuel storage, facility size, and limited access?
- How would the environmental risks created by on-site fuel storage be mitigated?

Given the potentially significant impacts of data centers on electricity, water, the environment, public services, future development, agriculture, neighboring communities and their quality of life, these are issues planners need to ***consider thoroughly before any approvals are granted.***



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