



Panel Discussion: Data Centers in Virginia

November 17, 2023

Outline

- 1 Overview of Data Centers Incentives and Challenges
- 2 Introduction of Panelists
- 3 Panel Discussion: Status and Future of Industry
- 4 2024 Session Outlook

Purpose

- Discuss the successes and challenges of the data center industry in Virginia.
- Provide an overview of economic development incentives related to data centers from both the state and local perspectives.
- Review previous and future evaluations of data center incentives and their effectiveness.

Definition

- Data Centers are facilities that house networked computer equipment, including servers and data storage devices, and related equipment such as batteries, backup power generation, and cooling, to manage, process, and distribute information.
- May be classified as enterprise, colocation, hyperscale, edge, or modular.

Source: Northern Virginia Technology Council (NVTC), The Impact of Data Centers on the State and Local Economies of Virginia, March 2022.

What is hyperscale?

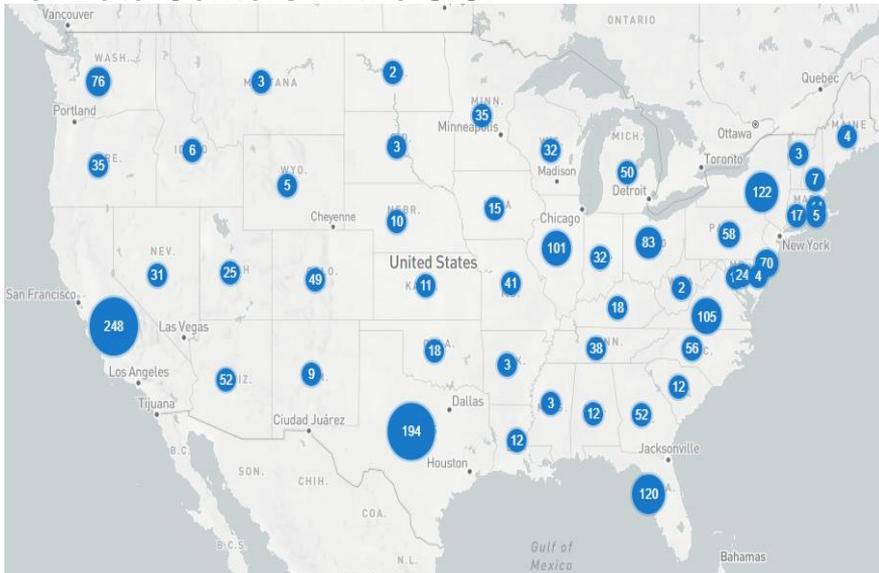
- Mission critical facility that supports robust and scalable workloads.
- Typically exceed 5,000 servers and 10,000 square feet.
- Often associated with large tech companies.
- Support thousands of individual servers operating via high-speed connectivity.

What is colocation?

- Third-party leased facility that provides the building, cooling, power, bandwidth and physical security.
- Customer provides the servers and data storage assets.

Northern Virginia is the Largest Data Center Market in the US because of Strengths that Benefit the Industry

Northern Virginia Has the Highest Concentration of Data Centers in the U.S.



- Stable climate and low level of seismic activity (few earthquakes).
- Relatively low power cost rates.
- Well-educated workforce.
- Proximity to major customers (federal government, federal contractors, tech firms).
- Confluence of major internet infrastructure elements.
- Virginia was an early offeror of incentives.

Source: datacentermap.com/USA. Accessed 11/6/2023.

Source: www.governing.com/infrastructure/the-data-center-capital-of-the-world-is-in-virginia. Accessed 10/3/23.

Virginia's SUT Exemption is a Significant Incentive

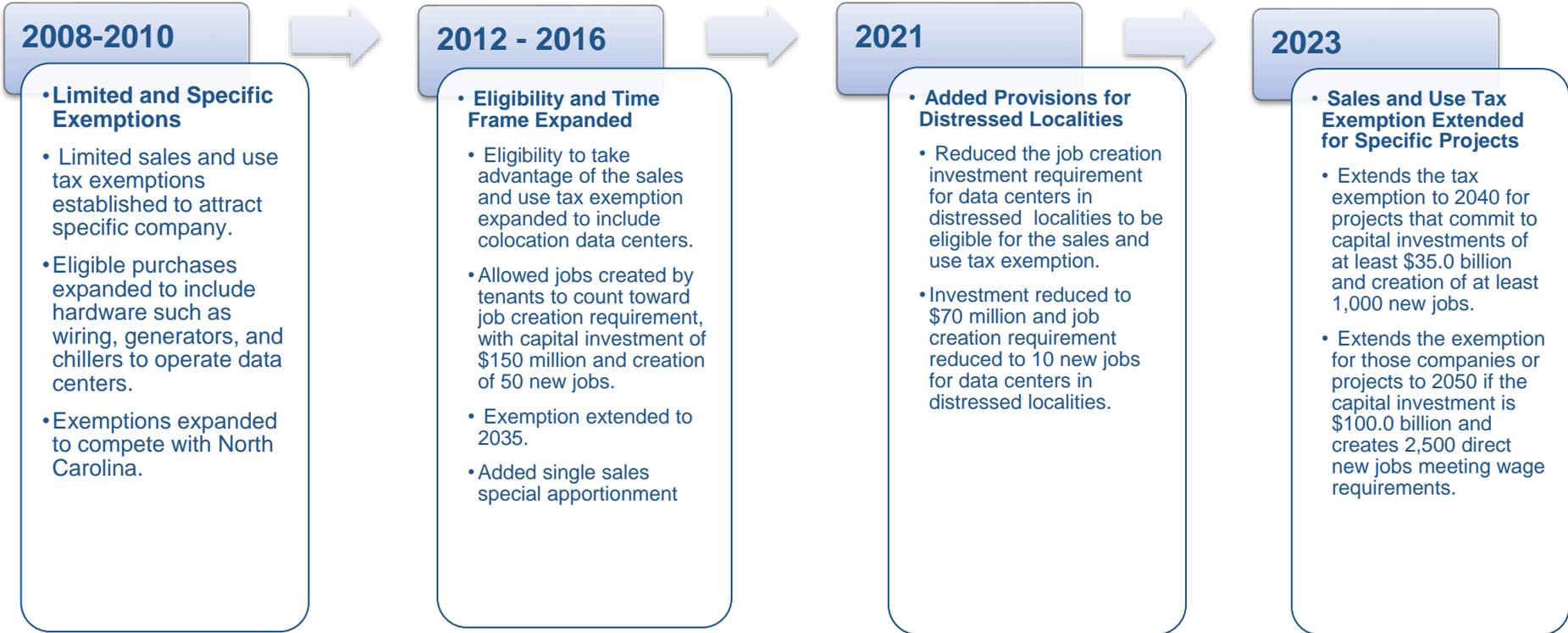
- Purchases of qualifying equipment are eligible for a sales and use tax exemption for data centers meeting **investment and job thresholds (\$150.0 million capital investment and 50 new jobs, except in distressed localities)** under a Memorandum of Understanding with the Virginia Economic Development Partnership.
- The incentive is the estimated forgone tax revenue.

(\$ in Millions)	FY 2022	FY 2023	FY 2024*	FY 2025*
Total Qualifying Investments in Virginia	\$9,422.9	\$16,062.9	\$16,548.9	\$16,886.6
Total Sales and Use Tax Exemption Claimed	(673.5)	(932.7)	(961.0)	(980.6)
State – GF Unrestricted	(258.8)	(357.9)	(368.7)	(376.2)
State – GF Restricted (education and transportation)	(300.5)	(416.8)	(429.5)	(438.3)
Local	(114.2)	(158.0)	(162.8)	(166.1)

*Estimated using CPI forecast to inflate future values.

Source: VEDP and TAX, preliminary reporting under provisions of § 58.1-609.3, Code of Virginia.

Evolution of Data Center Incentives



Source: JLARC, *Data Center and Manufacturing Incentives*, June 2019. §58.1-609.3, Code of Virginia.

Recent Challenges Related to Data Centers

- Substantial energy demand from data centers.
- Industry growth is concentrated in certain regions of the state.
- Local government tax base dependence.
- Land use and environmental concerns.
- Highly competitive national incentive marketplace.

Meet the Panelists



Josh Levi

President,
Data Center
Coalition



Christina Winn

President and
Executive Chair,
Virginia Economic
Developers
Association



Bill Murray

Senior Vice
President –
Corporate Affairs
and
Communications,
Dominion Energy



Stephen Hartka

Vice President –
Research,
Virginia Economic
Development
Partnership



Kimberly Sarte

Associate Director -
Ongoing Oversight
and Fiscal Analysis,
Joint Legislative
Audit and Review
Commission



Data Centers:

Powering the Internet and the Global Economy

Josh Levi, President
Data Center Coalition



Data Center Coalition

- **The Voice** of the data center sector.
- **Advocates** for a business climate, policies, and investments that support the growth and competitiveness of the industry.
- **Information Resource** for elected officials, candidates, community leaders, and other stakeholders.

Virginia's Data Center Industry

Jobs

- 2021 Direct Employment: 17,380
 - 32% Increase Since 2017
- 2021 Total Employment (Direct, Indirect, and Induced) : 86,290
 - 26% Increase Since 2017

Labor Income

- 2021 Total Labor Income: \$7.9 billion
 - 57% Increase Since 2017

GDP Impact

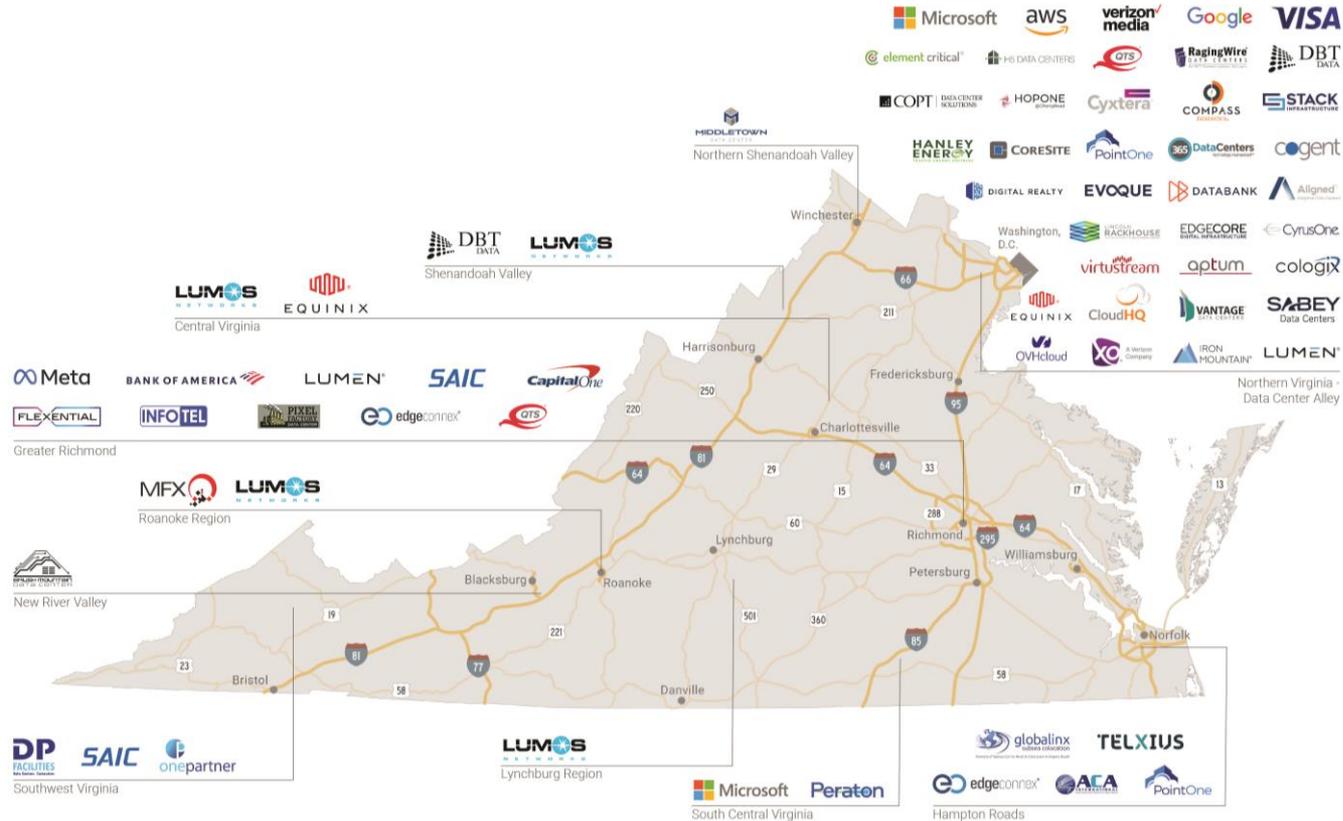
- \$13.525 Billion in 2021
 - 52% Increase Since 2017



Why Data Centers?

- Significant driver of Virginia's economy.
- Enable digital infrastructure that supports platforms, industries, and applications individuals and organizations rely on.
- Represent huge capital investments.
- Generation of substantial tax revenue.
- Build and support larger ecosystems of suppliers, service providers, and other sectors of the economy.
 - Each direct job in the data center industry supports more than six additional jobs.

Data Centers in Virginia



Source of Image: Virginia Economic Development Partnership

Data Centers in Virginia

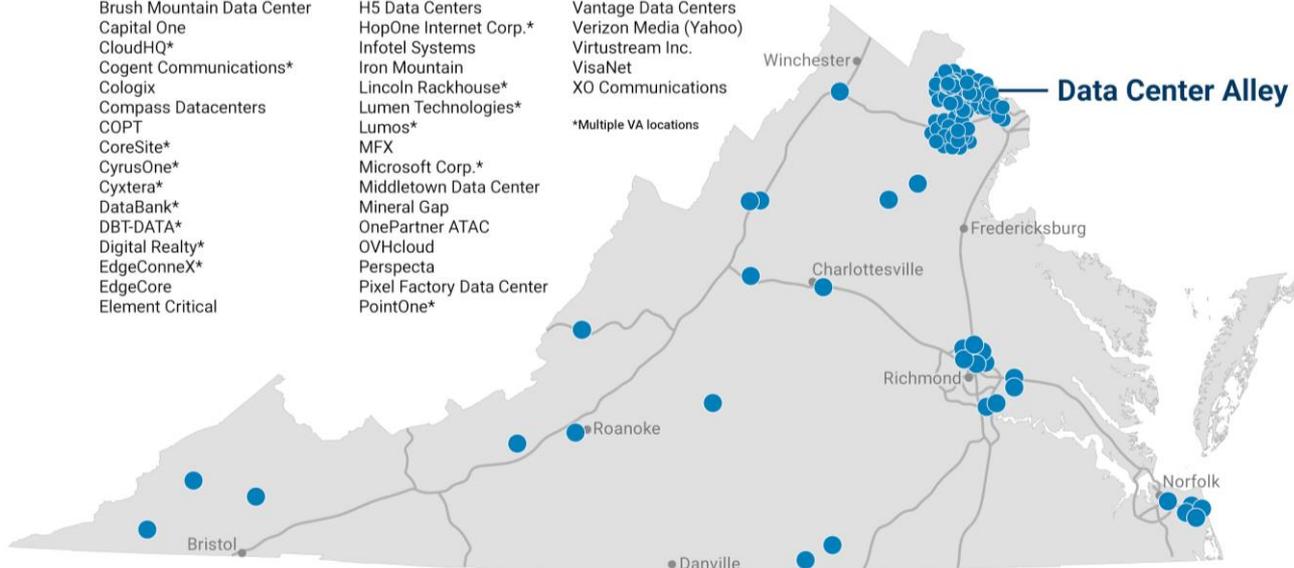
Major Data Centers in Virginia

365 Data Centers
 ACA International
 Aligned
 Amazon Web Services*
 Aptum Technologies
 Bank of America
 Brush Mountain Data Center
 Capital One
 CloudHQ*
 Cogent Communications*
 Cologix
 Compass Datacenters
 COPT
 CoreSite*
 CyrusOne*
 Cyxtera*
 DataBank*
 DBT-DATA*
 Digital Realty*
 EdgeConneX*
 EdgeCore
 Element Critical

Equinix*
 Evoque
 Facebook
 Flexential
 Globalinx Data Centers
 Google*
 H5 Data Centers
 HopOne Internet Corp.*
 Infotel Systems
 Iron Mountain
 Lincoln Rackhouse*
 Lumen Technologies*
 Lumos*
 MFX
 Microsoft Corp.*
 Middletown Data Center
 Mineral Gap
 OnePartner ATAC
 OVHcloud
 Perspecta
 Pixel Factory Data Center
 PointOne*

Quality Technology Services (QTS)*
 RagingWire*
 Sabey Data Centers
 SAIC and VITA*
 Stack Infrastructure*
 Telxius
 Vantage Data Centers
 Verizon Media (Yahoo)
 Virtustream Inc.
 VisaNet
 XO Communications

*Multiple VA locations



Source: Data Center Hawk, Baxtel.com, Company Websites

● Publicly Disclosed Data Center Location

Recent Publicly Reported Projects and Announcements Include:

- Caroline County
- Culpeper County
- Fauquier County
- Hanover County
- King George County

- Louisa County
- Spotsylvania County
- Stafford County
- Surry County



**Josh Levi, President
Data Center Coalition**

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VIRGINIA ECONOMIC DEVELOPMENT ASSOCIATION



Christina Winn
2023 VEDA President

CONSIDERATIONS

- **Economic Impact**
 - Major driver of sizable capital investments that increase the overall commercial tax base providing local government revenue stream to fund schools, parks, libraries, and social services.
 - Critical for state and locality to maintain competitive operating costs to ensure continued reinvestment in properties.
 - Minimal impact on localities to provide road infrastructure and other local ongoing operational support services.
 - Data center industry is driving investment in businesses in the data center supply chain.



CONSIDERATIONS

- **Workforce**
 - Careers offer rapidly rising high wages with continued career growth.
 - Offers alternative career pathway for non-college bound students.
 - Data center companies offer competitive benefits and work environments.
 - Skills can be transferable to other industry sectors.
 - Almost twice as many construction jobs.



CONSIDERATIONS

- **Market Competition**
 - Non-Disclosure Agreements (NDAs)
 - Proactive vs Reactive markets
 - Incentives
 - Over 30 states have some type of incentives to attract data centers
 - Operating costs and tax environment
 - Expedited permitting



CONSIDERATIONS

- **Land Use**
 - **By-right, Rezoning, Special Use Permits**
 - “Campus” projects tend to have longer build-out timelines
 - Entitled projects, consistent with other types of commercial projects, may be entitled for more square footage than what will ultimately be built.
 - Enterprise vs. co-location (may not know the end-user/tenant)
 - Adjacent uses and noise
 - Technological evolution of the data center industry



CONSIDERATIONS

- **Design Standards**
 - **Site Design**
 - Building placement and orientation
 - Screening mechanical equipment and substations
 - Buffer yard requirements
 - Fencing and security
 - **Building Design**
 - Massing and scale
 - Entryways
 - Fenestration/windows
 - Exterior colors and materials



CONSIDERATIONS

- **Sustainability Measures**
 - Due to large capital investment, the data center industry is driving innovation to meet sustainable goals.
- **Site Design Standards**
 - Minimize land disturbance, tree preservation, reduce surface runoff, maximize open space and trails, etc.
- **Building Design Standards**
 - Efficient water usage and recycling, sustainable building materials, reduce power consumption, etc.
- **Energy Supply and Transmission Lines**



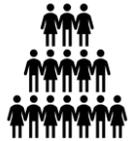
William "Bill" Murray

Senior Vice President – Corporate Affairs and Communications

Dominion Energy



Committed to serving the people of the Commonwealth by safely providing reliable, affordable, and increasingly clean energy



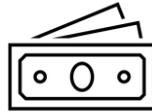
2.7M

Electric customers
(homes and businesses)



10,000+

Employees & contractors



16%

Below the national
average residential rate



65,000+

Miles of power lines



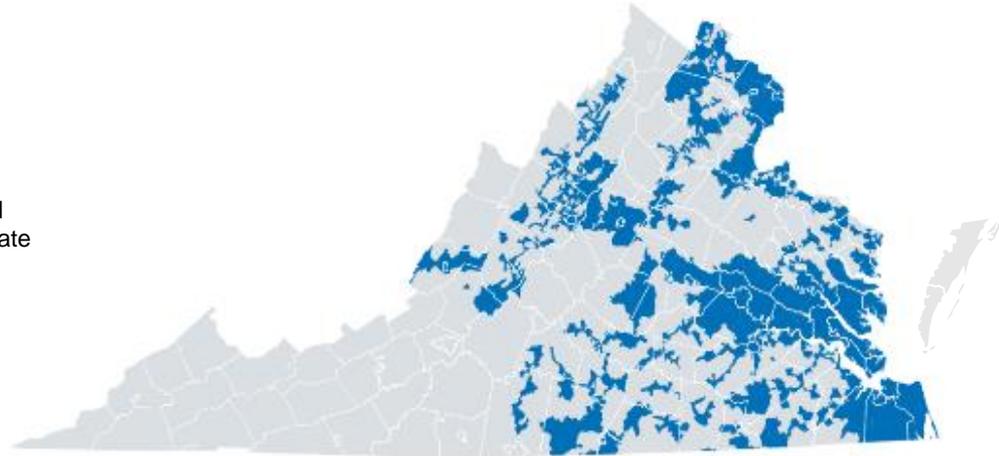
20,400+

Megawatts of generation



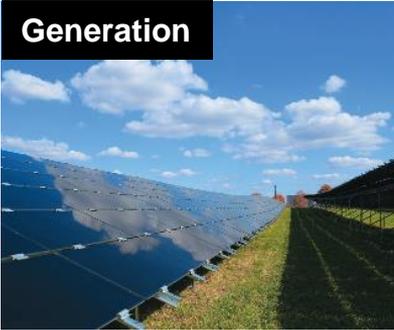
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Years of EnergyShare



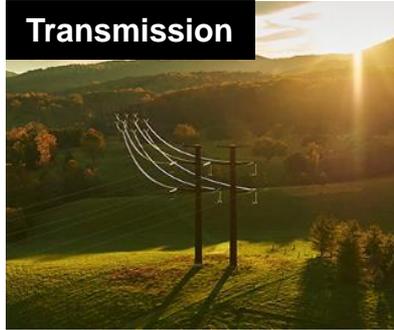
Core Operational Segments of an Electric Utility

Generation



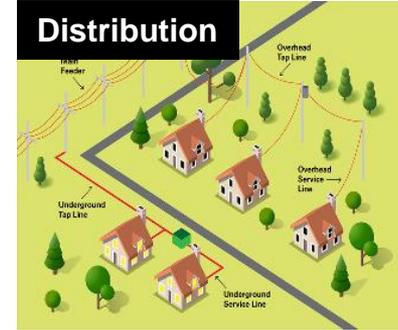
- Ex: solar, wind, hydro, biomass, nuclear, natural gas, coal
- Purchased power from the wholesale (PJM) market
- Must balance generation and load (customer demand)
- Baseload units: able to operate around the clock to serve demand
- Peaker units: run only during periods of high (peak) demand

Transmission



- Transmission substations “step-up” electricity to high voltage
- Higher voltage minimizes energy loss over long distances
- Regional transmission network operated by PJM Interconnection
- Interstate transmission also subject to federal regulation (FERC)

Distribution



- Distribution grid substations “step-down” to lower voltage
- Transformers on utility poles further reduce voltage
- Voltage lowered to be compatible with household appliances, etc.
- Neighborhood “tap lines” connect to individual end-use customers

The SCC’s regulatory oversight and ratemaking authority covers all segments.

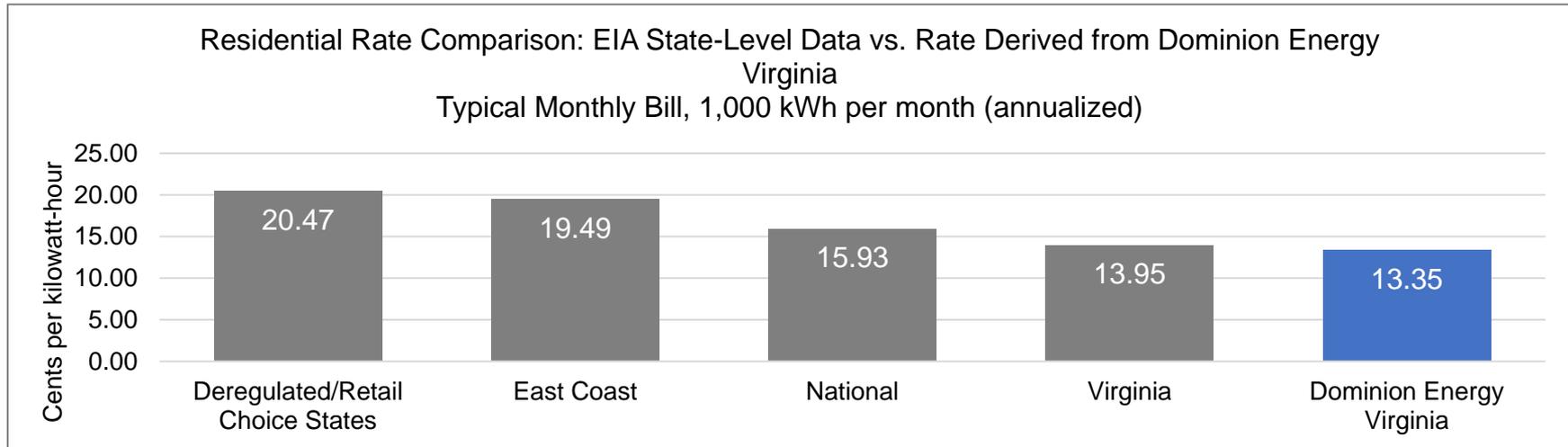
A Megawatt Is Not a Megawatt

Generation Type	Average Capacity Factor	Carbon-free?	Fuel-free?	Dispatchable?	Rotating Mass?
Solar Photovoltaic	~28%	YES	YES	NO	NO
Offshore Wind	~42%*	YES	YES	NO	NO
Biomass	~83%	Carbon-neutral (per EPA)	NO	YES	YES
Natural Gas Combined-Cycle	~87%	NO (~1/2 carbon of coal)	NO	YES	YES
Advanced Nuclear	~90%	YES	NO	YES	YES

*Reflects expectations for the commercial-scale Coastal Virginia Offshore Wind project's net capacity factor (Case No. PUR-2021-00142).

As of November 2023, DEV's residential rate was:

- 4.3% below the Virginia average
- 16.2% below the National average
- 31.5% below the East Coast average
- 34.8% below the Deregulated/Retail Choice States



Deregulated/Retail Choice States: CT, ME, MA, NH, RI, NJ, NY, PA, IL, MI, OH, DE, DC, MD, TX, CA, OR.

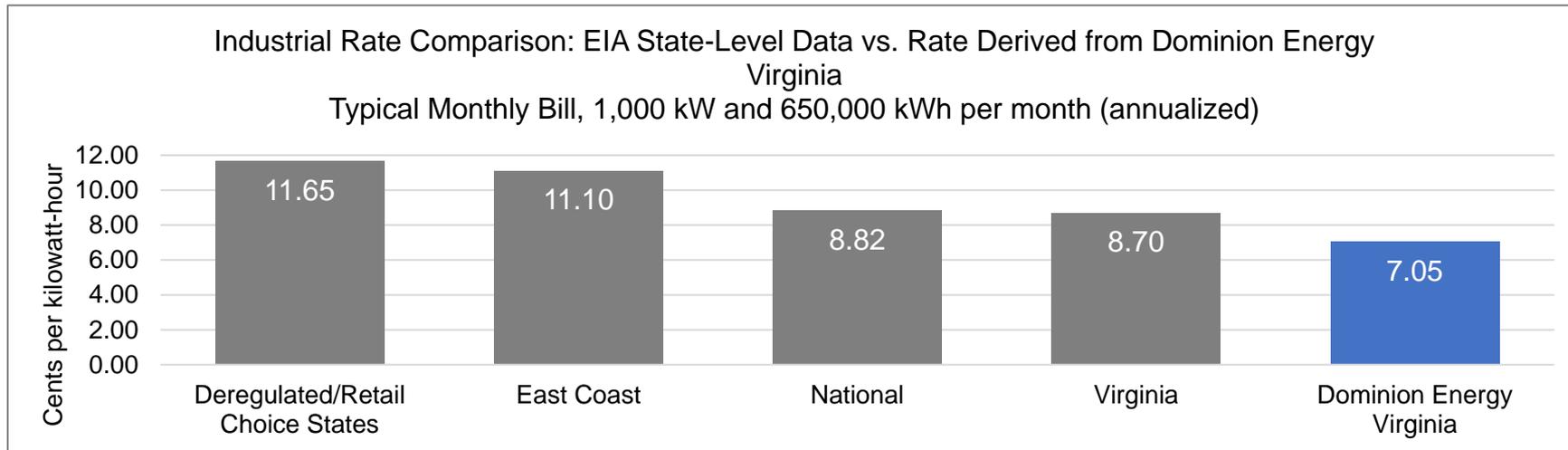
East Coast Average: CT, ME, MA, NH, RI, NJ, NY, PA, DE, DC, FL, GA, MD, NC, SC, VA.

DEV Source: Derived from the typical customer bill as of November 1, 2023 (for 1,000 kilowatt-hours of usage).

Benchmarks Source: U.S. Energy Information Administration, Table 5.6.A Average Price of Electricity to Ultimate Customers by End-Use Sector. Data released October 24, 2023, reflecting August 2023 rates.

As of November 2023, DEV's industrial rate was:

- 19.0% below the Virginia average
- 20.1% below the National average
- 36.5% below the East Coast average
- 39.5% below the Deregulated/Retail Choice States



Deregulated/Retail Choice States: CT, ME, MA, NH, RI, NJ, NY, PA, IL, MI, OH, DE, DC, MD, TX, CA, OR.

East Coast Average: CT, ME, MA, NH, RI, NJ, NY, PA, DE, DC, FL, GA, MD, NC, SC, VA.

DEV Source: Derived from the typical customer bill as of November 1, 2023 (for 1,000-kilowatt demand and 650,000 kilowatt-hours of usage).

Benchmarks Source: U.S. Energy Information Administration, Table 5.6.A Average Price of Electricity to Ultimate Customers by End-Use Sector. Data released October 24, 2023, reflecting August 2023 rates.

THE ECONOMIC DEVELOPMENT PERSPECTIVE ON DATA CENTERS



Stephen Hartka

Vice President, Research

Virginia Economic Development Partnership

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DATA CENTER SALES AND USE TAX (DCSUT) EXEMPTION

- DCSUT exemption first enacted in 2008 and gradually expanded.
- Currently available through June 30, 2035, unless the company meets the investment and job creation provisions required for an extension.
- Eligible investment includes computer equipment (e.g., servers), enabling software, and enabling hardware (e.g., chillers and backup generators).
- Open to enterprise or colocation data centers that make a new capital investment of at least \$150.0 million and create at least 50 new jobs.
 - Lower thresholds (\$70.0 million / 10 jobs) in distressed localities.
- Data center must enter into a Memorandum of Understanding with the VEDP and report annually on investment, jobs, payroll, etc.
- New eligibility thresholds were enacted in 2022 (SB1522/HB2479) to secure a historic investment by AWS, allowing for the extension of the tax exemption to 2040 or 2050 depending on the level of investment or job creation.

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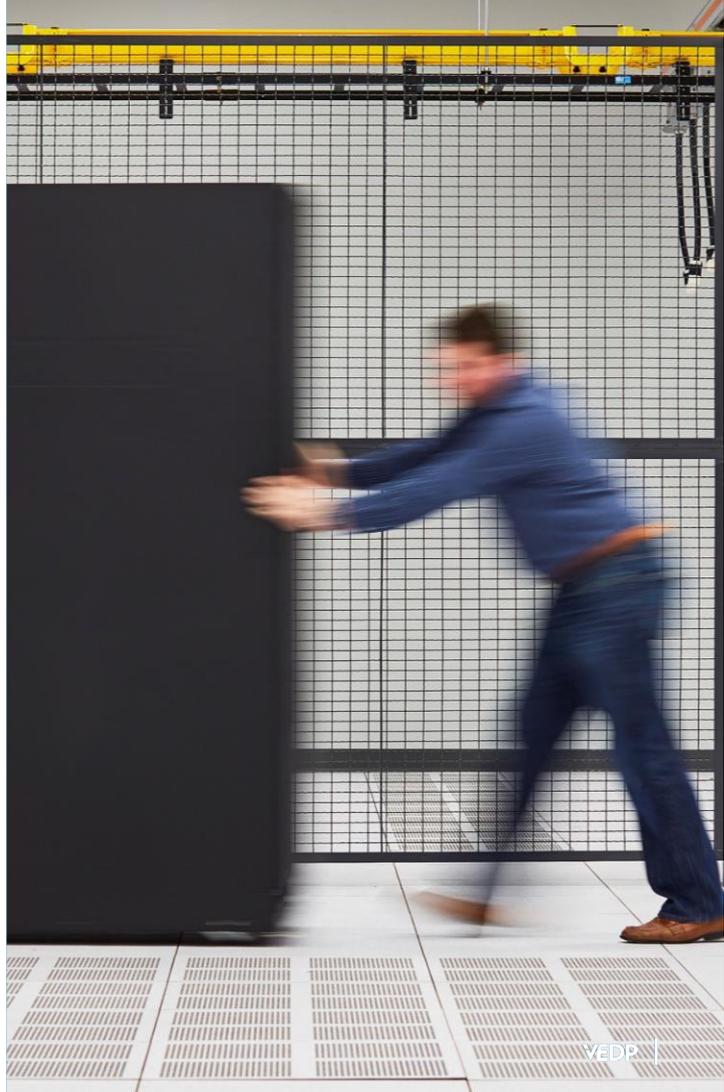
Memoranda of Understanding signed by VEDP

\$37.8 billion

Investment by participating data centers in FY22
– FY23

6,700 jobs

Direct jobs supported by participating data
centers in FY23



OVERVIEW OF DATA CENTER ECONOMICS

Lifecycle phases

Initial construction



Taxable events

- Land purchase, infrastructure improvements, and site preparation
- Construction of shell buildings (up to 250k sqft or larger)
- Initial installation of heavy equipment and servers

Primary direct revenue streams

- Income Tax on construction workers
- Sales Tax on construction materials and non-exempt equipment
- Recordation Tax

On-going operation



- Personnel costs (direct employment)
- Contractors & support staff
- Utility consumption (electricity, water)
- On-going maintenance

- Income Tax on workers and contractors
- Real Estate & Tangible Personal Property Tax
- Electric Utility Consumption Tax

Refresh / expansion

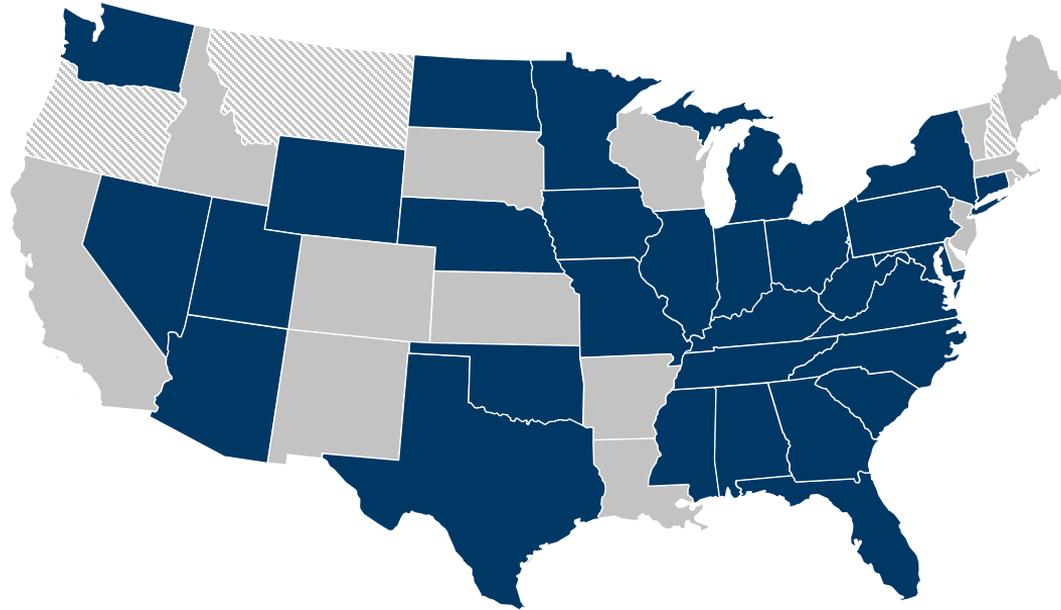


- Refresh investments to replace expended servers and other equipment
- Construction and installation of new equipment associated with expansions
- New direct employment associated with expansions

- Income Tax on construction workers and new direct employment
- Tangible Personal Property Tax (resets depreciation on servers)
- Sales Tax on construction materials and non-exempt equipment

THE MAJORITY OF STATES OFFER FAVORABLE SALES TAX TREATMENT TO DATA CENTERS (OR HAVE NO SALES TAX)

■ States with favorable sales tax treatment for qualifying data centers ■ No sales tax

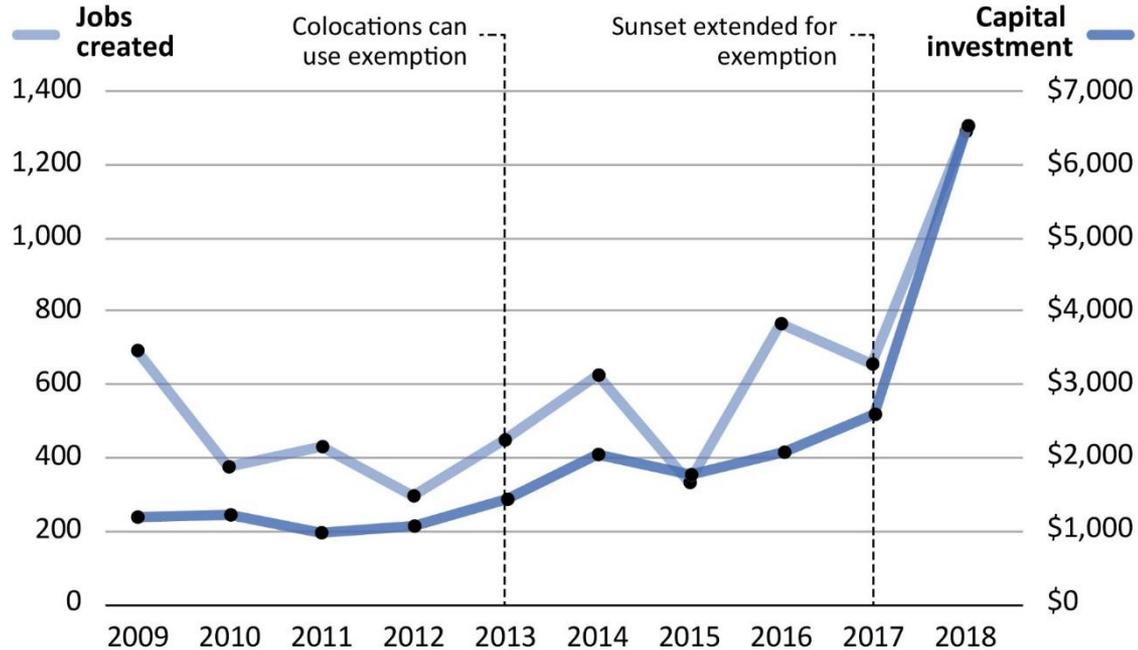




JLARC Data Center Studies

Kimberly Sarte, Associate Director

2019 Review: Exemption has been an influential factor in industry's growth in Virginia



Based on VEDP announcement database. Jobs and investment are assigned to year announced.

2019 Review: Data center exemption has high economic benefit and return in state revenue relative to other incentives (FY10–FY17)

High economic benefit per \$1M of incentive



155
jobs



\$26.5M
state GDP



\$14.6M
personal
income

High return in revenue



72¢
per \$1 spent

2019 review indicated a moderate economic benefit and return in state revenue, but reclassified to high as additional incentives have been evaluated. Estimates in 2019 review based on spending and economic activity data available at the time, which were likely an underestimate.

Recommendation

The General Assembly may wish to reduce or remove the minimum job creation requirement for data centers locating in a distressed area or enterprise zone to qualify for the exemption.

Action Taken

2021 General Assembly reduced the job creation requirement from 25 to 10 jobs and the capital investment requirement from \$150.0 million to \$70.0 million in distressed localities.

SB 1423 – Senator McPike; HB 2273 – Delegate Morefield

Recommendation

The General Assembly may wish to require

- data centers to submit an annual report on their employment levels, capital investment, and tax benefit to VEDP
- TAX to publish an annual report of the forgone revenue from the data center exemption

Action Taken

2021 General Assembly required

- data centers to report employment information, capital investment, and tax benefit annually to VEDP
- VEDP and TAX publish report on fiscal and economic impacts of exemption every two years

SB 1423 - Senator McPike; HB 2273 - Delegate Morefield

Recommendation

The General Assembly may wish to direct the Secretary of Finance to convene a work group to conduct a data center industry study to examine

- actions to maintain the state's competitive position; and
- whether opportunity exists to reduce the level of the exemption without adversely affecting industry growth.

Action Taken

Issues would likely be considered in a 2024 JLARC data center study.

2024 JLARC review of data centers

To be considered at December JLARC meeting.

2024 Session Outlook

- There may be interest in extending the expiration or expanding the qualifications for the data center sales and use tax exemption.
- Concern remains about quantifying the job growth associated with data centers.
- Land use concerns related to noise generation, electricity and water use, as well as impact on surrounding parcels may continue to be an issue.
- JLARC study resolution being considered at the December meeting may provide an updated evaluation and further policy considerations, if approved.