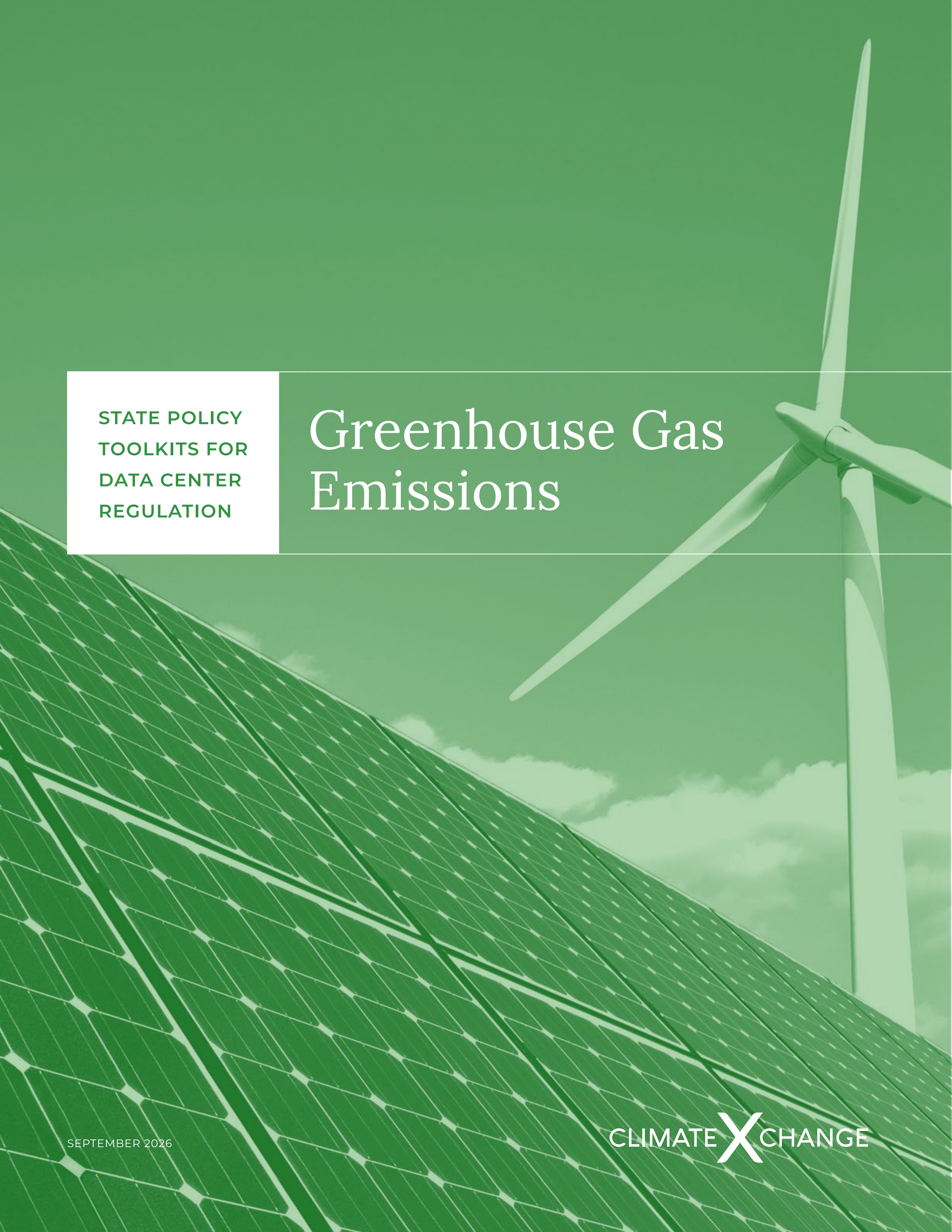

STATE POLICY TOOLKITS FOR DATA CENTER REGULATION

Greenhouse Gas Emissions

SEPTEMBER 2026

CLIMATE XCHANGE

GREENHOUSE GAS EMISSIONS

About this Toolkit

As data centers spread across the country, they are imposing costs on utilities, ratepayers, water authorities, and communities. State governments are looking for new tools to contain the impacts of massive data center spread, including on public health and the climate. This toolkit draws from many examples in 2025 and 2026 state legislative sessions, during which the Climate XChange team has reviewed over 400 bills addressing data center impacts.

This resource, co-authored with experts from the World Resources Institute Polsky Center for the Global Energy Transition, represents one of five installments in Climate XChange's State Policy Toolkits for Data Center Regulation, which will be released throughout 2026. This document tackles the tools that states can use to address and mitigate the impacts that data centers have on greenhouse gas emissions. It should be considered alongside other toolkits describing state policies addressing data center impacts on water resources, electricity affordability and reliability, tax and employment justice, and transparency concerns. Look out for the complete Toolkit Series at Climate XChange's **Resources for Regulating Data Centers Page**.

AUTHORS

JORDAN GEROW
Policy and Research Director, Climate XChange

IAN GOLDSMITH
Clean Energy Research Associate, World Resources Institute Polsky Center for the Global Energy Transition

RUBY WINCELE
Policy and Research Manager, Climate XChange

CONTRIBUTORS

LORI BIRD
U.S. Director, World Resources Institute Polsky Center for the Global Energy Transition

MICHELLE LEVINSON
Senior Manager for Electrification Finance & Policy, World Resources Institute Polsky Center for the Global Energy Transition

MARK FALINSKI
Senior Manager for Power Transition and Decarbonization, World Resources Institute Polsky Center for the Global Energy Transition

PAOLA FERREIRA MIANI
Executive Director, Climate XChange

KRISTEN SOARES
State Climate Policy Network Manager, Climate XChange

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With the rapid buildout of data centers across the country, states must have strong policies to prevent potential negative impacts on the environment, climate, energy systems, and local communities. Climate XChange's policy toolkits, educational programming, and technical assistance are solely focused on addressing these impacts. Our organization is not involved in advocacy, nor does it have the expertise to assess the broader societal and economic effects of widespread artificial intelligence adoption in the United States.

STATE POLICY TOOLKITS FOR DATA CENTER REGULATION

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Introduction

BACKGROUND

Data centers are the leading driver of electric load growth in the United States, and, without smart policy interventions, are on track to drive a corresponding increase in greenhouse gas emissions (GHGs). National estimates of data center load suggest that it could increase sixfold from **2025 levels** by 2035, hitting **194 gigawatts** (GW), if projects are able to overcome **hurdles ranging from labor availability to policy uncertainty**. As data center electricity demand increases, the GHG emissions attributable to both on-site and off-site power generation required to serve that load threatens to increase as well, jeopardizing the GHG reduction targets of states across the country.

A **2025 report** from the Center for Biological Diversity found that carbon emissions from US data centers could triple by 2035, contributing more than 350 million metric tons of carbon equivalent emissions annually, or nearly half of the electricity emissions allowable nationally while meeting the country's strictest climate targets. A **Cornell team found that**, by 2030, the current rate of AI growth would release an additional 24 to 44 million metric tons of carbon dioxide annually, the emissions equivalent of adding 5 to 10 million cars to U.S. roadways. An **April 2026 study** found that current and planned data centers could impose $45 billion in annual environmental costs from power consumption alone. CXC has published **projections of potential GHG growth** attributable to planned data center development in the most heavily impacted states.

Introduction

Of course, these emissions impacts will only be felt if data centers are powered by polluting generators. Planned hyperscale developments suggest this is a likely outcome: as of July 2026, Meta's planned Hyperion data center in Northern Louisiana includes three already approved natural gas plants, and another seven proposed plants, **with a combined 7.5-GW capacity**—an increase equivalent to more than 30 percent of Louisiana's current grid. A **proposed Wyoming project** would scale to nearly 10 GW of power demand—roughly equivalent to the peak energy demands of New York City—largely met by on-site natural gas.

Beyond these hyperscalers, Climate XChange has documented instances around the country where **expansions and delayed retirements** of fossil fuel plants have been approved specifically to serve new or anticipated data center demand. This trend is largely attributable to developers' need for speed in the face of supply chain disruptions, as well as long interconnection queues for renewables and lengthy utility planning cycles, which results in projects seeking the fastest interconnection arrangement possible, or even building gas-powered data centers **entirely off grid**. It is also attributable to the demand for reliable, firm power both at data centers and across the grid at large; with massive amounts of renewable energy projects held up by interconnection bottlenecks across the country, it remains challenging to meet the scale of data center growth and maintain grid reliability without a diverse generation mix.

Some hyperscale developers, however, have demonstrated a capacity to support data center energy use with renewable energy and advanced clean technologies like battery storage and geothermal. Meta, Amazon, Google, and Microsoft collectively accounted for **76 percent** of all corporate clean energy power purchase agreements by volume in 2025, representing 22.3 GW of solar, wind, nuclear, geothermal, and hydro. Some of these investments are **explicitly to deliver power to data centers**. These examples show what is technically possible, and what can be encouraged or required at scale with the right state policy in place.

This toolkit will address the GHG emissions attributable to data centers, drawing on what is already being proposed across the country, as well as emerging technical and policy tools.

Introduction

CREATING AN ENABLING ENVIRONMENT FOR CLEAN DATA CENTER DEVELOPMENT

This toolkit largely focuses on policy approaches to regulate data centers themselves. However, data centers do not exist in a vacuum and how their power needs are met will be greatly influenced by other state policies that create the climate for clean energy and transmission development generally. Considerations beyond the scope of this report include:

Accelerating Transmission Buildout and Modernization: Data centers will have limited options to run on clean energy as long as interstate transmission networks fail to bring that power online and actually deliver it to the data center. States have a variety of tools to improve transmission development. This will require **regional collaboration** to bring transmission from generation-rich areas to load-rich areas. Some policy pathways for accelerating transmission buildout and modernization include:

- **Deploying advanced transmission technologies** (ATTs)
- **Expediting permitting for transmission along highways**
- Establishing **transmission planning authorities** to finance, plan for, and expedite permits of these facilities
- **Consolidating permitting** authority for transmission projects at the state level

Renewable Siting Reform: States have a variety of options for **expediting the siting and permitting of renewables**, including consolidating review, requiring concurrent reviews, identifying priority areas, tightening timelines, and even **pre-permitting Build-Ready sites**.

Minimizing Interconnection Delays for Renewables and Storage: With a **massive backlog of interconnection requests** and growing delays to connect, states must prioritize **innovative efforts** to speed up interconnection, including **using advanced study software**, fast tracking for certain project types, and promoting renewables at **surplus interconnection sites**. For states covered by Regional Transmission Operators (RTOs), many of these efforts may only be pursued through RTO engagement.

All these tools are critical for states to consider with or without the growth of data centers in mind. Their importance is only heightened by the challenge of meeting rapidly expanding energy demand with clean energy.

Introduction

WHY STATES MUST ACT: THE JURISDICTIONAL CASE

State governments have primary authority over the retail electric system. **About three quarters** of Americans get their electricity delivered by investor-owned utilities, which are highly regulated by state public utility commissions (PUCs). Actors across state governments have a part to play in leveraging that authority.

State PUCs set the terms by which utility companies will allow some data centers to connect to the grid, and they may set requirements related to where data center power comes from through tariff proceedings.

State governors can issue orders requiring or encouraging PUCs to undertake these proceedings, and other executive agencies can coordinate to encourage proactive planning for data center development.

State legislatures can similarly compel PUCs to undertake proceedings to regulate data centers, and may stipulate terms around energy consumption, energy efficiency, and other emissions-reducing operations directly in statute.

State legislatures can set conditions related to renewable energy use and emissions impact on tax incentives or data center permits, including business licenses, siting approvals, Certificates of Public Convenience and Necessity, construction approvals, and commencement of operations approvals.

There is an exception to this authority that varies state by state. Approximately one quarter of Americans either receive their electricity from a municipally owned utility (muni), or in many rural parts of the country, a cooperatively owned utility (coop). Municipal and cooperative utilities are often exempted from PUC regulation or have limited regulation, meaning policymakers will have to assess the terms by which munis and coops are regulated in their state to understand what tools are available to them.

Outside of the retail energy system, states will have to contend with federal jurisdiction. Under the cooperative federalism balance of power set forth in the **Federal Power Act** (FPA), the Federal Energy Regulatory Commission (FERC) has **authority** over wholesale sales of electricity in interstate markets, interstate transmission, and reliability standards, including the interconnection of generators that sell power in wholesale markets. While states play a key role in addressing data center energy issues, there are jurisdictional gaps where federal actions are necessary. FERC can address transmission and wholesale market costs attributable to data centers, and encourage RTOs to solve generator interconnection queue backlogs that delay clean energy deployment.

Addressing some of these concerns, on June 18, 2026, **FERC issued six orders** tailored to RTOs, directing them to address transmission service application standards and study processes, measures to prevent cost shifts onto other ratepayers, accommodations for data centers co-locating with generation, and providing flexible power supply for data centers. Responsive filings from the RTOs are pending at the time of this writing. At the legislative level, there is also increasing interest in Congress to pass laws that would **encourage clean energy consumption**, or **penalize data centers** for their climate pollution. While states do not have direct authority over outcomes at FERC or in Congress, state policymakers can certainly engage with both of these bodies to help influence federal policy that supports state goals.

Introduction

THE VALUE OF A HOLISTIC APPROACH

Data centers have impacts far beyond GHGs, including on **electric rates and reliability**; on **water resources**; on tax revenue and economic development outcomes; on local air quality and other environmental factors, such as noise pollution; and more. Regulating each of these issues separately may impose tradeoffs. For example, from a technical perspective, there is a well-known **tradeoff between on-site water efficiency and energy efficiency** in cooling data center servers, where less water-intensive cooling technologies may have higher energy demands.

A holistic approach to data center regulation can help states fully consider such tradeoffs, avoid regulatory misalignment, and proactively identify win-win opportunities. States that holistically consider what kind of data center development they might want, where they want it, and how they want those facilities to operate will invite a more coordinated market response that matches their state's goals, from energy affordability to decarbonization.

Climate XChange is publishing **five toolkits** for regulating data centers at the state level, focusing on emissions, **water**, **electricity rates and reliability**, **transparency**, and taxes and employment. We encourage policymakers to consider these resources in tandem to help identify the combination of policy approaches that works best for their jurisdiction.

THE TOOLS

Regulating Data Centers to Minimize Greenhouse Gas Emissions

State policymakers and advocates have many tools, both established and emerging, to ensure that data centers minimize their GHGs. These include tools to minimize the carbon intensity of off-site power, reduce data centers' actual power demands overall, mitigate the environmental impacts of on-site backup power, and locate data centers where there is potential for on-site or nearby clean energy and efficiency investments that reduce the GHG footprint of both the data center and nearby customers. These strategies are detailed below.

REQUIREMENTS V. INCENTIVES

Throughout this toolkit, different strategies will call for data centers to change their behavior either by imposing requirements on them, or attaching conditions to qualify for certain financial, operational, or permitting incentives.

Requirements might include making data centers reduce their emissions impact to receive essential permits, tariffs, or licenses, including: electricity service contracts, business licenses, siting approvals, Certificates of Public Convenience and Necessity, construction approvals, or commencement of operation approvals.

Incentives can include expedited review of each of the preceding permits, as well as financial or operational incentives. Financial incentives might include a **favorable treatment under an electricity tariff**, sales and use tax incentives, property tax abatements, and more (note, however, that a **growing swath of states** are **attempting to repeal** existing data center tax incentives in 2026). Operational incentives might include an exemption from an operational requirement, like the requirement to reduce load during peak demand periods, for example.

Whether a requirement or a conditional incentive will be more impactful, broadly applicable, or politically feasible will vary depending on the policy design and state in question. Policymakers should be attuned to which approach will cover more of the market, provide stronger frameworks for compliance, and avoid public subsidization of data center development.

FIVE STRATEGIES TO TACKLE DATA CENTER IMPACTS ON GREENHOUSE GAS EMISSIONS

State tools to regulate data centers' impacts on GHGs fall into the following categories:

1. Create frameworks to enable, incentivize, or require data centers to procure some or all of their energy from additional, physically deliverable clean energy.
2. Direct data center development toward sites with clean energy, grid, and waste heat opportunities.
3. Reduce emissions and air pollution impacts from on-site operations and backup generation.
4. Take steps to reduce the need for utility-scale fossil fuel generation through demand-side solutions, flexibility, energy efficiency, and grid utilization.
5. Require analysis and transparency of data center impacts on GHGs and clean energy goals.

STRATEGY ONE

1

Create frameworks to enable, incentivize, or require data centers to procure some or all of their energy from additional, physically deliverable clean energy.

The most impactful way for state legislators to reduce current and future emissions from data centers is to ensure that their load is met with clean energy. Different strategies may apply depending on the type and location of that energy—this strategy will focus on off-site energy purchases, while on-site energy will be further explored in Strategies 2 and 3.

To meet enormous new power demand from data centers, state legislators should work to create frameworks that result in **additional, physically deliverable clean energy capacity** to meet the needs of new data centers in their jurisdiction. Under current commonly accepted **GHG accounting rules**, a company may use RECs or other clean energy attribute certificates sourced from regions with excess renewable capacity, such as California or Texas, and retire them on behalf of data centers in regions that are not connected on the same grid.

While this is currently an accepted practice under accounting protocols, it does not necessarily lead to additional clean generation in the state or region where the data center is located. States may also further wish to encourage **daily- or hourly-matched capacity**, which matches actual energy usage with clean energy on a more frequent basis and encourages the development of multiple types of clean energy resources.

ADDITIONALITY, DELIVERABILITY, AND TIME MATCHING

The optimal renewable energy requirement for data centers will include at least the first two criteria outlined below:

Additionality

Additionality refers to the idea that a clean or renewable energy development would not have happened without the active intervention or participation of the buyer. For example, the clean energy used to meet new data center loads should be additive on top of what is used to meet other customer clean energy demand or a policy requirement, such as a clean energy standard. Additionality ensures that data centers are not simply taking advantage of resources that would have come online anyways, leaving the state further from meeting its goals, or causing other customers to pay the extra cost of attracting new resources.

Deliverability

In the context of clean energy procurement, deliverability refers to the ability of energy from a generation source to be physically capable of reaching the customer. While it is practically impossible to determine exactly where an electron delivered through the grid is generated, boundaries between market regions, grid interconnections, and transmission congestion mean that not all energy is likely (or even capable of) reaching certain locations. The simplest version of this requirement is on-site power; however, since many data center sites cannot support additional large-scale renewable or clean energy development, states may also propose requirements for power to be delivered into the same utility service territory, balancing authority, or wholesale market region.

Time Matching

States may also consider imposing requirements to time-match the energy used by data centers. **Time matching** refers to ensuring that energy use by a facility is being served by clean or renewable energy on a daily or hourly basis, instead of in aggregate across a year. For example, a data center may enter into a power purchase agreement with a solar generator for a certain amount of power per year; however, that solar generator will be unable to physically serve that data center's electricity needs at night, meaning that it will be served by other sources during that time. Therefore, time matching ensures that a facility is being mostly or fully powered by clean energy sources at all times, encouraging the development of multiple projects and kinds of resources. Critics of time matching requirements, however, point out that **its value in corporate carbon accounting generally is debated**, it may raise prices on the **voluntary renewable market**, and **may cause inadvertent cost shifts to other customers**.

States can consider a wide variety of strategies to ensure that this occurs, including:

1 Require data centers to be served by clean energy.

States can require new and/or existing data centers to partially or fully match their energy usage with clean or renewable energy.

Before implementing clean energy requirements standards for data centers, states should carefully consider multiple factors regarding scope and implementation. Firstly, states need to address whether utilities or other load-serving entities will procure and deliver clean energy on behalf of data centers, or if individual data centers will be required to demonstrate compliance on their own. This is dependent on what is allowed or required by state law. Where utilities bear the compliance obligation, policymakers should be attuned to the potential for overlap between clean energy requirements for data centers and renewable or clean energy standards applicable to the power served to other customer classes.

For example, Minnesota's **HF 16** (2025, enacted) requires that the Minnesota Public Service Commission evaluate whether "the electricity to be provided by the utility to a very large customer achieves each quantitative benchmark of the state's [clean] electricity standards, [...], as demonstrated by a plan submitted by the utility to serve the additional load without recourse to requesting a delay or modification of these standards."

Also, states should consider the qualifications for data centers that clean energy requirements apply to, such as size, type of data center workloads, and whether existing data centers should have to meet new rules in addition to new data centers. States with large existing data center markets may wish to include existing data centers in their rules to spur new clean energy development, for parity with any new requirements, and to ensure that existing data centers stop contributing to rising emissions.

CLEAN ENERGY REQUIREMENT EXAMPLES

Legislative

New Jersey **Senate Bill 680** (2026, proposed) would require all "AI data center[s]" and cryptocurrency mining facilities to source 100 percent of electricity from newly-constructed renewable sources or nuclear power plants, as measured on an hourly basis. Notably, the bill stipulates that this mandate would not come into effect until the Board of Public Utilities finds that a majority of other states in the PJM region have adopted similar requirements.

Legislative

Colorado **Senate Bill 26-102** (2026, proposed) would require the Colorado Public Utilities Commission to study whether it is technically and economically feasible for large load data centers to meet their demand with 100 percent hourly-matched renewable energy. If the Colorado PUC does find it is possible, data centers must procure 100 percent of their energy from renewable resources on an hourly-matched basis by 2031. If it is not found possible, the Commission must determine the percentage that is feasible and mandate that data centers achieve that percentage, updating it on a regular basis.

Legislative

New York **Senate Bill S6394A** (2025, proposed) would require one-third of all energy used to serve large data centers to be sourced from renewable energy resources by 2030. This requirement rises to 50 percent by 2035 and 100 percent by 2040.

Regulatory

Missoula County **Zoning Code Amendment** (2021, enacted) restricts cryptocurrency mining facilities to specific industrial zones and requires all new applicable facilities to develop or purchase 100 percent of their electricity from new renewable energy. The code explicitly requires additionality, stating that cryptocurrency mining facilities must be able to establish they contributed to introducing new renewable energy onto the grid "beyond what would have been developed otherwise." This requirement was later **expanded** to include all data centers.

2 Develop new programs to allow or incentivize data center demand to be met with clean energy resources.

States can require that utilities offer data centers or all large load customers options for meeting their new load with additional, deliverable clean energy. This does not guarantee that data centers will adopt these options, however, the existence of these programs may work in tandem with existing companies' sustainability commitments. These programs may also pave the way for future data center developers to more easily support additional, deliverable clean energy development if a procurement requirement is established in the future.

On top of existing procurement mechanisms, states can also encourage or require adoption of newer models being explored in some jurisdictions throughout the country. These include:

Bring Your Own New Clean Energy (BYONCE)

Bring Your Own New Clean Energy (BYONCE) describes a set of options where a large load customer is able to solicit proposals for and sponsor the construction of new, off-site clean energy generation specifically to serve their energy needs. This may include large utility-scale generation and storage, distributed generation, or virtual power plants (VPPs). This model differs from corporate renewable procurement through utilities, often called "green tariffs", in that the projects to be built are not initially proposed or contracted for by utilities, but are rather brought by the customer as a proposal for the utility and utility regulator to review. As political pressure for data centers to "pay their own way" has grown, and demand rapidly outstrips supply in regions like PJM, states and utilities are increasingly looking to "bring-your-own-energy" options to protect other ratepayers from bill impacts.

BYONCE EXAMPLES

Legislative

Illinois POWER Act (2026, proposed) would require all hyperscale data centers to demonstrate plans to power themselves using new, grid-deliverable "bring-your-own" clean energy capacity developed or contracted for by the data center company. If the data center does not provide all of its energy through bring-your-own clean energy capacity, it must make the remaining energy demand available for curtailment in cases of emergency. As part of their "Clean Energy Supply Plan," data centers may procure utility-scale generation and storage as well as distributed resources, virtual power plants (VPPs), demand response, and energy efficiency.

Regulatory

Georgia Power's Customer-Identified Resource Program (2026, approved) **established** a new Customer-Identified Resources (CIRs) Program. This program allows data centers and other large customers to bring proposals for clean energy power plants to Georgia Power and include them as part of Georgia Power's annual renewable energy RFP solicitations. The program allows for customers to procure up to 3,000 megawatts (MW) of new renewable energy by 2035.

Clean Transition Tariffs

Clean Transition Tariffs (CTTs) are an emerging new model for green energy procurement, especially relevant for vertically-integrated utility models. Under a CTT, a buyer may voluntarily sponsor the development of a clean energy facility and agree to pay an additional fixed premium rate to all of the facility's incremental costs. In turn, the customer is credited on their bills with the generation and capacity value of the resource. While CTTs can be used to support any kind of resource, this model is particularly valuable for catalyzing investment in emerging clean firm energy sources with high upfront investment costs. Under a CTT, a customer can directly support these technologies and cover the extra costs compared to less expensive technologies, while shielding utilities from operational and financial risks and other ratepayers from extra costs.

CLEAN TRANSITION TARIFF EXAMPLES

Regulatory

Google CTT Procurement: In **May 2025**, the Public Utilities Commission of Nevada (PUCN) approved an agreement between Google and utility NV Energy allowing Google to take energy from a new, 115 MW next-gen geothermal facility developed by Fervo Energy. This agreement was facilitated under a newly introduced Clean Transition Tariff, which allows customers to work with NV Energy to identify mutually beneficial clean firm resources to meet customer demands. The customer then negotiates a rate for a fixed energy charge based on the revenue requirements for the clean firm facility, after which the agreement is reviewed by the PUCN. If approved, NV Energy may go ahead with contracting for the facility.

Using the same tariff, Google contracted with NV Energy for **150 MW** of advanced geothermal capacity in February 2026. Google has also advanced similar tariff structures in other jurisdictions, notably in **Minnesota** to support wind, solar, and long-duration energy storage.

3 Implement fees or surcharges on data centers to support clean energy or grid development.

States may consider levying some kind of fee, surcharge, or other payment mechanism on data centers to explicitly support clean energy development and grid development in their states. This could be structured as a lump sum or yearly payment assessed at the individual data center level or as a line item applied to data center customers under a specific utility tariff based on energy usage. States could use these funds to create new programs or support existing efforts to advance clean energy.

DATA CENTER FEE EXAMPLES

Legislative

Maryland **Senate Bill 341** (2026, proposed). Under Maryland law, electric utility companies pay a "franchise tax" to the state for the privilege of doing business in Maryland. This tax is calculated based on gross receipts as well as on the amount of kilowatt-hours sold to customers, and is recovered directly from consumers on their energy bills. **SB 341** would set aside 75 percent of franchise tax revenues that are attributable to customers using more than 100 MW of electricity towards an escrow account, which would be distributed to electric companies in the state to fund future purchases of solar energy RECs in line with meeting Maryland's renewable energy portfolio standard targets.

Legislative

New Jersey **AB6040** (2025, proposed) orders the New Jersey Board of Public Utilities to establish a surcharge on data centers over 50 MW applied during times of peak demand. All revenue collected from the surcharges would be deposited in a newly created "Grid Modernization Fund," which would only be used to fund efforts to modernize New Jersey's electricity grid for greater resiliency and renewables integration.

4 Tie data center incentives to clean energy use.

As of July 2026, **38 states** offer tax incentives for new data centers, most commonly sales or use tax exemptions on data center equipment, and, less often, for utility costs. States may also give, or authorize local governments to negotiate, property tax abatements to data centers. These tax incentives are typically already tied to requirements including data center size, jobs created, and investment value. Research suggests that, while **other factors may be more important** in data center siting decisions, state tax incentives are **influential** in shaping siting decisions for larger, more energy-intensive projects.

Building on existing models, states can require clean energy use or investment by data centers looking to access these tax breaks. Michigan's **Public Act 181**, enacted in 2024, introduced the first model of this kind: the law requires data centers to have procured (or committed to procuring within six years of when it is built) at least 90 percent of their energy from eligible clean sources to be eligible for tax incentives.

As with other clean energy compliance mechanisms, states should be careful to ensure incentives actually result in added clean energy. Michigan, for example, has seen implementation issues with Public Act 181; in November 2025, the Michigan Strategic Fund, responsible for issuing tax exemption certificates, released **guidance** stating that data centers could qualify for the incentive as long as they had a contract with a utility provider subject to Michigan's overarching clean energy standards. These guidelines have been fiercely challenged by state environmental advocates, arguing this is an **incorrect** interpretation of the law and will not result in any new clean energy being developed to serve data centers. States should therefore be explicit in legislation regarding acceptable compliance mechanisms for clean energy requirements, including whether or not utility renewable or clean energy standards apply.

DATA CENTER INCENTIVES FOR CLEAN ENERGY EXAMPLES

Legislative

Colorado **Senate Bill 25-280** (2025, proposed) provides tax incentives to data centers based on the achievement of two different levels of certification. Base-level certification would require sourcing at least 50 percent of electricity from clean or renewable sources, including coordination with the utility on clean energy integration or implementation of energy storage, alongside requirements for economic investment, job creation, and other sustainability provisions. Meeting base-level certification would provide a 100 percent sales and use tax exemption on IT equipment, data center infrastructure, and on-site energy infrastructure, which **attracted opposition** from environmentalist groups in Colorado for the generosity of its incentives. The second level, an "enhancement certification," requires a $10 million investment in grid enhancement and modernization as well as in workforce development or other community benefit programs. This certification adds an income tax credit worth 10 percent of any grid enhancement and modernization investments, which rises to 15 percent if deployed in a rural area.

Legislative

Virginia **House Bill 897** (2026, proposed) would require data centers seeking to take advantage of Virginia's existing sales and use tax exemption on data center equipment to contract for clean energy resources. The percentage of energy demand required to be met with clean sources is tied to Virginia's existing renewable portfolio standard (RPS), with the value being equal to the RPS requirement for the data center's existing utility accelerated by ten years. Beginning on July 1, 2029, data centers taking service from Dominion Energy will be required to meet the utility's 2039 target of 75 percent renewable energy. This required percentage would rise to 100 percent by 2035 (10 years ahead of Dominion's 100 percent by 2045 requirement).

2

STRATEGY TWO

Direct Data Center Development Toward Sites with Clean Energy, Grid, and Waste Heat Opportunities.

States have the opportunity to locate data centers near resources that would allow them to operate with reduced GHGs by utilizing local renewable power and storage, reutilizing waste heat, and supporting other local emissions-offsetting investments. State governments have a key role to play in identifying these opportunities, ensuring communities benefit, publicizing them, and imposing requirements or offering incentives for locating data centers in opportunity zones.

1 Identifying Opportunity Zones.

This toolkit offers a noncomprehensive list of the types of sites and resources that might enable data centers to operate with reduced emissions. For each type, different state agencies may be tasked with the effort to qualify those sites.

SOLAR-RICH, WATER-SCARCE: COMPARING ENERGY AND WATER IMPACTS

There is a clear tension in concentrating data center development in regions like the water-strained American southwest, which provide abundant access to solar power and limited access to water. However, while data centers have notoriously high on-site water demands, they actually have significantly higher off-site water demand, driven primarily by the cooling needs of **fossil fueled electricity generation**. One estimate comparing these sources of water demand found that, in 2023, data centers across the U.S. **required 12 times more water** indirectly for electric generation than for on-site cooling. When considering the potential of renewable powered data centers in water-scarce areas, policymakers should bear in mind the water demanded on site, as well as the water saved from avoiding fossil fuel generation.

Surplus interconnection sites near renewables

One of the most promising types of opportunity zones for data center development is at sites with surplus interconnection capacity and on-site or nearby renewables development. Surplus interconnection capacity refers to when the existing grid could interconnect more electric demand (or supply) without needing to invest in grid upgrades. It often exists where fossil fuel generation plants have recently retired, or where similar industrial loads may have moved or reduced their demand. Several analyses have pointed towards the technical potential of data centers to co-locate with renewables at surplus interconnection sites, with estimates including **50 GW**, **333 GW**, and even **850 GW**.

At the state level, identifying these sites is most naturally a task for utilities and grid operators, acting under guidance from a state PUC, and in consultation with state energy authorities. This may also be tasked to an interagency group with input from utility regulators. Beyond state authorities, coordination with RTOs and ISOs would be helpful.

SURPLUS INTERCONNECTION EXAMPLES AND RESOURCES

Legislative

Maryland's **HB 940** (2026, proposed) would offer expedited permitting approvals to large load projects located in areas with surplus interconnection capacity, using nearby renewable power or batteries, and/or participating in demand response.

Legislative

Virginia's **SB 508** (2026, enacted), includes pilots requiring utilities to study surplus interconnection capacity and solicit solar and storage projects to utilize it.

Several states, including **Indiana**, **Utah**, and **Virginia** have also proposed or required that studying surplus interconnection become a regular part of utility integrated resource planning.

A Surplus **Interconnection Dashboard** produced by GridLab and Berkeley shows the surplus interconnection potential available nationwide for solar, wind, and storage.

Smaller data centers may pose similar opportunities at the distribution level. As certain AI applications mature, there may be increased demand in the years ahead for **smaller data centers located closer to their end users**, bucking the current hyperscale trend. Utilities may help identify opportunities to bring these 5 to 20 MW facilities online. Currently, 58 utilities and agencies in 26 states **publish** hosting capacity maps, which show the distribution system's ability to accommodate additional load or generation capacity in various locations. These maps, or similar new analyses, can inform where developers may choose to build data centers by identifying areas with more existing headroom on the system. State legislators or regulators can require utilities to conduct analyses and create hosting capacity maps for this purpose.

Off-grid renewable microgrids

As more data centers **turn** to **on-site power**, renewable microgrids may pose a convenient option. An **Off Grid AI white paper** found that solar-plus-storage data center projects might be faster to build than baseload gas turbines, while the technical potential for these sites exceeds 1,200 GW in the U.S. Southwest alone. There are a small number of off-grid, renewable data centers planned or operating around the country, including in **Storey County** and **Sparks**, Nevada, and **Laredo, Texas**.

State governments may play their part by designating state lands that can be used for these purposes. **State trust lands**, for example, are common in the intermountain west. These areas are typically managed by departments of environmental protection, natural resources, or state land offices, which may designate lands for renewable energy development serving adjacent data centers, as occurred for **a recently approved Utah project**. State legislatures may also require these agencies to **inventory their state-owned lands** and waters to determine where there are areas suitable for data centers powered by renewables.

Geothermal energy sites

According to **a 2025 Rhodium** analysis, next-generation geothermal technologies could play a major role nationwide in providing power to data centers, particularly if siting practices prioritize geothermal resources. Google, for example, has already received PUC approval in Nevada to **power its data centers** with new enhanced geothermal resources. If data centers were steered towards **areas with the most geothermal energy**, Rhodium's analysis finds that geothermal could satisfy all projected data center demand growth through the early 2030s, and at prices 31 to 45 percent lower than if the same projects were simply clustered around the types of metro areas where they've traditionally been built.

HELPING DATA CENTERS ACCESS GEOTHERMAL POWER

States can take specific actions to encourage data center siting opportunities that deploy on-site geothermal, including but not limited to identifying priority sites:

Conducting a state inventory of suitable geothermal locations

Washington **SB 6039** (2024, enacted), for example, required the state's Geological Survey to maintain a comprehensive database of publicly available subsurface geologic information and to establish a grant program to incentivize exploration for locations suitable for geothermal energy.

Streamlining permitting processes for qualifying co-location projects

California's **SB 887** (2026, proposed), for example, allows the governor to certify data center and geothermal projects as environmental leadership development projects, eligible for expedited California Environmental Quality Act (CEQA) judicial review.

Clarifying ownership of subsurface resources under state law

The status of geothermal rights **can vary state by state**, depending on how each state defines surface estate rights and differentiates them from mineral or water rights, or whether the state actually defines geothermal rights directly. Texas' **SB 785** (2023, enacted) clarified that landowners (or surface estate owners, where there is a difference) own geothermal energy, providing a model for other states attempting to scale the industry.

Thermal energy network sites

Data center processors produce a massive amount of waste heat that can and should be meaningfully reused. Beyond capturing and reusing it on-site, data center developers can also leverage this resource to serve nearby communities or industries through a thermal energy network (TEN). This type of heat sharing **can reduce data centers' power consumption by up to 30 percent** while providing offtakers with an alternative to gas boilers for hot water production. Ideal offtakers of data center waste heat might include nearby facilities **in the food and beverage or pharmaceutical industries** or commercial building sectors, though residential applications have also been developed in **Sweden**, **Denmark**, **Ireland**, and **New York City**. The lack of national or subnational leadership in helping steer these siting efforts **has been cited as a barrier to deployment**.

DATA CENTER THERMAL ENERGY NETWORK EXAMPLES

Legislative

New York A.9136 (2025, proposed) would require feasibility assessments for connecting thermal networks within one mile of a new data center.

Legislative

Virginia HB 323 (2026, enacted) tasks a work-group with studying how waste heat can be transferred between buildings, specifically targeting data centers located near potential off-takers.

Legislative

New Jersey S.796 (2026, enacted) requires utilities to file large load tariffs designed to incentivize large load data centers to capture and utilize the heat produced by the large load data center.

Legislative

Virginia HB 2578 (2025, proposed) would create mapping tools that match heat needs with data centers.

The Building Decarbonization Coalition has also developed **additional policy recommendations** to support this emerging sector, including designing data center buildings for TEN-readiness, imposing data center waste heat recovery mandates, stakeholder engagement, and benefit sharing requirements.

Distributed capacity sites

Investing into distributed capacity may help data centers mitigate their own grid impacts, while substituting grid power for cleaner alternatives. A 2025 **Rewiring America report** found that, for example, by paying for local heat pumps, data centers could offset one-third of their projected additional capacity needs; alternatively, they could offset all of their capacity needs by equipping suitable rooftops with solar and storage.

State legislatures or PUCs may wish to commission a study of where each of these types of investments may be most effective, or build a regular review of the technical potential for these projects and programs into integrated resource planning processes. Many of these opportunities may already be captured in utility planning. Consolidating them, identifying areas where data centers could fund them, and communicating that to the development community would be valuable. These technical opportunities are explored further in Section 4(2).

Siting to catalyze investment in grid resources, including transmission or grid-scale batteries

Multiple studies, including **DOE's 2023 Transmission Needs Assessment**, have shown the U.S. needs to at least double its transmission capacity to accommodate widespread electrification and bring new generation online. Strategically located data centers can help pay for these investments by locating where the transmission required to serve them can complement the transmission required to serve other resources, including clean energy. This strategy might also tend to reduce the stranded asset risk that data centers pose to ratepayers, when the infrastructure that goes to supporting them may have a viable second life supporting clean energy (a '**productive bubble**').

State transmission authorities or PUCs should undertake or commission a study on grid needs to accommodate the buildout of new clean generation to meet growing electricity demand, and highlight sites where data center development could help pay for that infrastructure expansion. In different regions, there may be existing studies of the transmission needs associated with clean energy goals, as **New Mexico** and **ISO New England** have conducted. In the seven states that have created some form of authority to facilitate transmission development, **most conduct** some form of load forecasting or transmission capacity analysis, which may serve a similar purpose.

ENERGY RESOURCE ZONE EXAMPLES

States have taken different approaches to identifying where new renewable energy ought to be sited, and where transmission investment ought to flow. A **2025 ACEG report** pointed to state policies that examine transmission needs in the context of developing energy resource zones. Energy resource zones are strategic locations where wind, solar, and/or other energy resources are abundant or areas where there are transmission constraints that prevent needed generation from coming online.

Legislative

Texas' **Competitive Renewable Energy Zones** (CREZ) policy (repealed in 2023) required the Texas PUC to develop a plan to construct the transmission capacity necessary to deliver renewable energy in certain zones.

Legislative

Illinois' Renewable Energy Access Plan (REAP), adopted through the **Climate and Equitable Jobs Act** (2021, enacted), directed the Illinois Commerce Commission to develop a plan to achieve the transmission capacity necessary to deliver renewable energy in designated REAP zones to customers.

Legislative

Under **SB 20-190** (2020, enacted), Colorado requires electric utilities, every two years, to designate "energy resource zones" where transmission constraints hinder the delivery of electricity and/or the development of new electricity generation and develop plans for transmission facility construction or expansion.

2 Community consultation and harmonization.

States should engage early and often with local governments and communities around potential data center opportunity zones, while requiring that both data center developers and the state themselves are held to stringent transparency standards, paying special attention to how siting and accelerated permitting pathways impact environmental justice and low-income communities. States can require meaningful community consultation and notice, and direct specific methods for providing public input, such as a certain number of town halls or online engagement.

Throughout this process, communities should be presented with a full disclosure of anticipated data center community impacts on water, air quality, taxes, noise levels, and more. For additional information on the types of disclosures data centers should make to local communities and how to disseminate that information, see Climate XChange's toolkit on **data center transparency issues**, which tackles this issue in more depth.

A useful example of Opportunity Zone community engagement is found in **New York's Build Ready Program**. Under that program, advanced permitting for future renewables development is conducted by a state agency, with specific processes for communities to weigh in. Interested parties, including local elected officials, can nominate their own sites for consideration via a simple web form. Viable sites trigger a state engagement process with local landowners, while regulators engage with the host community during the planning process to develop a customized Host Community Benefit Program.

A state may also encourage localities to harmonize local permitting and zoning approaches to be compatible with a state program. States could instruct localities to classify data centers as either a conditional or prohibited use in particular zones, which might require them to qualify as an

Opportunity Zone or Zero Emissions Data Center in order to get built in those areas. At a minimum, states should discourage localities from approving data center development as-of-right without passing either a state or local review process.

States may also consider drafting model zoning code amendments for localities, which could set statewide standards for how to review noise levels, back-up power use, local water studies, and more. **Kentucky** and **Pennsylvania** provide existing and proposed examples of developing such a model code for municipalities.

3 Designing permitting incentives for qualifying projects.

States can incentivize data centers to locate in a specific area by conditioning state-level permitting or permitting-based incentives on that siting choice. These may include (1) qualifying for electric service under a new utility tariff or rate structure; (2) qualifying for specific permitting approvals; and (3) qualifying for expedited approval or pre-permitting.

First, states may allow opportunity zone data center projects to qualify for electric service under a new utility tariff or rate structure, such as an **existing large load tariff framework**, or a clean transition tariff. If a data center cannot take electrical service, or cannot take electrical service at a favorable rate, without operating in an opportunity zone, that might be a strong incentive for the industry to participate in such a program.

Incorporating siting priorities into electricity policy is not a novel concept. Several states, for example, offer **favorable price adjustments** for renewables projects that locate on disturbed lands, while some large load tariffs **offer favorable electricity prices** for a limited number of projects that locate near existing transmission capacity.

Second, states may allow opportunity zone data centers to qualify for specific permitting approvals that are typically offered at the state level, including business licenses, siting approvals, Certificates of Public Convenience and Necessity, construction approvals, or commencement of operation approvals. Other types of approvals might also be necessary to facilitate data center siting in specific opportunity zones. For example, in the context of data centers taking service at surplus interconnection sites, the grid operator or utilities might need to develop standard agreements for interconnection sharing between multiple customers, or procedures for the streamlined transfer of interconnection rights if an original generator retires. Each of these approvals, where applicable, can be made conditional on a project's siting in an opportunity zone.

Third, states may also allow opportunity zone data centers to qualify for expedited approval or pre-application permitting. In these locations, states may conduct pre-application permitting work or develop template agreements in order to facilitate rapid project approvals. Analogous processes have taken place around renewables development on brownfields, where **New York** and **Massachusetts** have tasked a state agency with much of the work that a developer would otherwise do to receive permitting approval for renewable development at a brownfield or other repurposed site. In Massachusetts, the state has **issued permits for post-closure landfills** to operate with renewable energy, which developers may apply for. In New York, the state developed a more expansive "Build Ready" program aimed at expediting permitting of renewable energy across a variety of preferred sites.

Under New York's program, administrators **must identify qualifying "Build Ready" sites**, and then undertake all necessary work to secure permits for that site. Sites with completed permitting would then be auctioned off through a publicly noticed, competitive bidding process. In effect, **program administrators carry out** "the project design, engineering, permitting, and electric grid interconnection activities as well as developing a project host community benefit package. Once a site has reached specific development milestones, the Build-Ready Program runs a competitive request for proposal to award and transfer the project to a private developer."

This, and **similar "Build Ready" type programs**, is a model that could be impactful in the data center context. States selecting for data center opportunity zones can perform project design and engineering studies sufficient to approve generic permits and interconnection agreements, which data centers developers can bid on in order to secure faster speed to market. In turn, the data center would commit to support certain renewable energy or efficiency objectives targeted for that opportunity zone.

4 Imposing financial penalties on projects that do not advance clean energy, efficiency, or grid goals.

States can impose fees or penalties on data centers at the individual or customer class level, and use these funds to support clean energy, efficiency, or grid goals.

DATA CENTER FEES EXAMPLES

Fees or penalties can take various forms, ranging from franchise taxes to carbon fees, peak electricity, or demand charges.

Legislative

Maryland's SB 341 (2026, proposed) would funnel franchise tax revenue from data centers into an escrow account that funds future purchases of solar energy RECs.

Legislative

New Jersey's A. 6040 (2026, proposed) creates a peak demand surcharge for large load customers that would feed into the state's Grid Modernization Fund.

Legislative

Virginia's HB 30 (2026, enacted) creates a first-in-the-nation surcharge on data center electricity consumption itself.

Legislative

The federal **Clean Cloud Act** (2025, proposed) would set a utility fee on data centers that varies based on the emissions attributable to their electricity consumption. The fee would start at $20 per ton of CO_2e above regional grid carbon intensity baselines, and increase by the rate of inflation plus $10 per year. Meanwhile, the baseline against which fees are calculated would automatically decline by 11 percent per year, so that by 2035, fees would apply to all emissions attributable to data center electric consumption.

3

STRATEGY THREE

Reduce emissions and air pollution impacts from on-site operations and backup generation.

With grid operators and data center developers embracing the "bring your own power" philosophy to bypass grid constraints, data centers are increasingly building their own behind-the-meter gas plants on-site. This strategy can ensure faster speed to power and avoids passing most costs onto ratepayers, however it can also sidestep state PUC regulations and clean energy requirements, significantly increasing GHGs and air pollution.

Global Energy Monitor **found** that nearly 100 GW of behind-the-meter natural gas power for data centers was in the development pipeline at the start of 2026—compared to four GW of data center-specific power in early 2024—representing more than one-third of total gas-fired power capacity under development in the U.S.

Most data centers also rely on fossil fuel backup generators for uninterrupted operation, which are typically diesel-powered, because, unlike natural gas, diesel can be stored on-site and is readily available. However, diesel generators have higher GHG emission rates **compared to natural gas** generators, and emit more toxic air pollutants, including fine particulate matter ($PM_{2.5}$), nitrogen oxides (NO_x), and sulfur dioxide (SO_2). For example, diesel generators emit **200–600 times more NO_x** than natural gas-fired power plants per unit of electricity produced. With diesel generator capacity at data centers nearly **tripling between 2018 and 2024**, their usage presents a significant threat to public health and air quality.

To address emissions from on-site energy generation, states have several options:

1 Require Cumulative Impact Analyses for Data Center Proposals.

A cumulative impacts analysis (CIA) provides a comprehensive look at all burdens that affect a community or neighborhood, including socioeconomic, health, and pollution indicators, such as how many other permitted facilities exist nearby. These analyses require new potential industrial impacts to be evaluated in the context of existing industrial activity and other factors that impact human health and community wellbeing.

Colorado, Connecticut, Massachusetts, Minnesota, New Jersey, New York, and Wyoming **currently require** analysis of cumulative impacts when issuing or renewing permits for certain pollution-generating facilities within or near environmental justice communities, typically focused on power plants, landfills, incinerators, sewage treatment plants, and major manufacturing plants. As the laws are written, project permits for major and minor sources may only be approved if a facility or unit would not exceed cumulative impact thresholds or limits defined by the state.

CIAs largely focus on co-pollutants emitted from sources of GHGs, so they are a tool that can be employed to better understand how emissions from data centers facilities impact surrounding communities. However, unless data centers are proposing significant on-site fossil fuel use, they often are not covered by these cumulative impact laws due to the emissions thresholds, covered facilities, and permitting requirements.

States with existing CIA requirements should strengthen these laws to lower the air pollution threshold in which cumulative impacts must be considered, require cumulative impacts of on-site primary and backup generation to be considered, or explicitly include all data center proposals in their statutes, regardless of emissions impacts or proximity to environmental justice populations. In states where cumulative impact laws do not currently exist, states should enact legislation requiring data centers to study cumulative impacts, publish those findings, and identify ways to mitigate those impacts in the pre-permitting stage, and implement those mitigation measures in order to receive project approval.

CUMULATIVE IMPACTS EXAMPLES

Legislative

Maryland's **HB 1484** (2025, proposed) would have required an environmental impact analysis to receive permit approvals, which includes a "burden report" if a project would cause **adverse impacts and meets certain criteria**. If a project was found to cause adverse impacts, the permit holder would enter into a "cumulative impacts agreement" and pay into a project-specific cumulative impacts mitigation fund for the life of the project.

Legislative

Virginia's **HB 607** (2026, proposed) would have directed the Department of Environmental Quality (DEQ) to conduct a three-year study on the cumulative air pollution impacts of data center generators and develop recommendations for future permitting and air quality monitoring. The study would consider the public health impacts of different types of pollution exposure, including from continuous lower level exposure from gas generators operated for primary power and short-term exposure from diesel generators.

Require standardized emissions reporting for on-site power

States can also require data centers to disclose their GHG and air pollutant emissions from on-site power generation. State legislatures can task an environmental department or air quality board with developing and implementing a standardized reporting framework requiring data centers to publicly disclose how often on-site generation will be running, and their emissions of GHGs and air pollutants, including $PM_{2.5}$, NO_x, and SO_2. Disclosing this information will also allow backup generators to be permitted based on realistic operational requirements.

REQUIRING AIR QUALITY ASSESSMENTS EXAMPLE

Legislative

Illinois' **SB 4016** (2026, proposed) requires the owner or operator of a data center with permitted diesel or natural gas powered backup generators to submit an annual air quality assessment report that includes total on-site emissions from carbon and the six criteria pollutants regulated under the Clean Air Act.

2 Limit the use of on-site fossil fuels and promote low- or zero-carbon alternatives for on-site operations and backup power.

Some data centers are getting approval for power generation that is intended to be temporary generation while they wait to connect to the grid, or secure their own behind-the-meter power supply—typically gas-fired generation—but end up using it for extended periods of time. Additionally, as more grid operators consider or require curtailing data centers at times of peak demand, the facilities **may rely more heavily on backup systems**. Backup diesel generators have also been relied on as a source of power amid supply chain delays for on-site gas turbines, despite being a dirtier and more expensive power source.

States can prohibit on-site fossil fuel generation for primary and backup power, only allowing fossil fuel-based emergency backup power where no feasible alternative exists. Proposed legislation from 2025 and 2026 has primarily focused on prohibiting the use of diesel for on-site primary generation, although states can prohibit the use of other fossil fuels, namely behind-the-meter natural gas turbines and natural gas engines. It is important to note, however, that there are no current technically or economically feasible alternatives to fully replacing diesel and gas backup generators at the scale data centers require (although fuel cells show **technical promise**, and currently available batteries **can reduce the scale of need**). This prohibition, therefore, may be perceived as a ban on new data centers in the short term.

States looking to maintain or attract data center development still have several options to limit on-site emissions, including:

STRATEGY	ON-SITE POWER SOURCE
Prohibiting approval of additional on-site fossil fuel generation or extension of existing permits, unless necessary for grid reliability.	Primary power
Requiring or encouraging behind-the-meter generation to be paired with **carbon capture and storage** technology.	Primary power. Technology has been **trialed** for diesel generators
Conditioning on-site fossil fuel use on what is necessary to maintain grid reliability.	Primary and backup power
Limiting approvals to stay in line with state GHG reduction and clean energy targets.	Primary power
Prohibiting fossil fuel backup power in non-attainment zones that already face higher air pollution levels.	Backup power

States should promote, or require to the extent that is technologically and economically feasible, low- or zero-carbon alternatives for primary or backup power, which may greatly reduce the scale of necessary fossil-fired generation. The use of these technologies, including energy storage, on-site solar, combined heat and power resources, fuel cells, and other alternative energy sources, can be requirements in order to receive project approval. A more moderate requirement would be to have data centers fund independent studies of their feasibility in order to receive project approval. States can offer incentives to increase their deployment, if a requirement is not politically feasible.

DISCOURAGING ON-SITE FOSSIL FUELS EXAMPLES

Legislative

Colorado's SB 26-102 (2026, proposed) would have required large-load data centers to maximize reliance on renewable and storage resources "to the extent technically and economically feasible" for on-site backup power, and only rely on combustion-based backup generation after evaluating and deploying alternatives to the maximum extent. Diesel generators would have to meet or exceed EPA Tier 4 emissions standards and use ultra-low sulfur diesel, while gas generators would have to meet EPA emissions standards, use best available methane leak detection and repair practices, and be prohibited from routine venting or bypassing emissions controls.

Legislative

Maryland's **SB 903** (2025, proposed) would have changed eligibility for tax exemptions to prohibit a data center from using any diesel fuel for on-site generation, except for backup power.

Study alternatives to on-site fossil fuel power generation

As on-site alternatives to gas turbines and diesel generators are not widely utilized by data centers right now, states can also commission studies to identify and consider alternative sources of on-site primary or backup generation. These studies should consider the costs, performance, and reliability of emerging technologies, and reasonable timelines in which they might be deployed at scale. States may also consider imposing a moratorium on data centers until these alternatives have been sufficiently studied and guardrails around on-site power are in place.

BACKUP ALTERNATIVES STUDIES EXAMPLE

Legislative

Virginia's **HB 824** (2026, proposed) would have directed the DEQ to establish a working group to study the cost and feasibility of non-diesel energy sources for primary or backup power generation by data centers, including energy storage resources, combined heat and power, and alternative energy sources.

3 Prohibit the use of backup generation in non-emergency or grid supporting situations.

A review of state data center permits found that total permitted capacity of backup generators has increased over time, likely used by the industry to ensure around-the-clock access to power as developers face requirements to curtail power usage in times of peak demand. Although increased reliance on backup diesel generators is not widespread practice now, it could increase as states impose policies aimed at maintaining grid reliability. In Texas, for example, **SB 6** (2025) empowers the state's grid operator, Electric Reliability Council of Texas, to disconnect large load customers at times of peak demand, and direct them to **deploy backup generation** or curtail their load.

Under Clean Air Act regulations, the U.S. EPA allows backup generators to operate with a 100-hour limit under non-emergency situations, like routine testing, of which 50 hours can be to participate in demand response programs to prevent local service interruptions and maintain grid reliability, if **certain conditions are met**. States can limit backup generators usage during emergencies, often imposing stricter requirements than federal law, which has no limits on the use of generators during emergency events like grid outages, extreme weather, or unexpected power plant interruptions. Current emergency definitions tend to be tied to regional or North American Electric Reliability Corporation (NERC) **energy emergency alert** (EEA) levels.

Extended use can also happen when states expand the definition of an "emergency" to include instances like planned grid outages, therefore expanding the allowable uses of backup generators. In Virginia, state regulators **issued guidance** clarifying the definition of an **emergency** includes planned power outages, meaning the state's 500 hour-limit for diesel generators under emergencies is applicable to many scheduled or planned outages as long as data centers receive notice within two weeks of the outage.

States can prohibit or limit the use of backup generation, except in true emergency, non-grid supporting situations. They should not be used for demand response. This restriction should also include a stringent definition of "emergency" that does not include planned outages. This prevents data centers from routinely using their highly-polluting generators for longer or more frequent periods of time, and only using them for their intended and permitted use—in emergency situations to directly power the data center facility.

RESTRICTING BACKUP GENERATION USE EXAMPLES

Legislative

Colorado's **SB 26-102** (2026, proposed) would limit on-site combustion generators to emergency use and no more than 50 hours of operation for required testing and maintenance, and prohibit their use for routine peak demand shaving or nonemergency grid support.

Legislative

Illinois' **SB 4016** (2026, proposed) would require that each air pollution construction permit for backup generators must: (1) meet standards at least as stringent as EPA Tier 4 standards for diesel generators and Tier 2 standards for gas backup generators; (2) operate solely as an emergency or standby unit (where a "qualified emergency situation [is where the] condition of an engine's emission controls poses a significant direct or indirect risk to human life."); and (3) must obtain a permit from either the Illinois Clean Air Act Permit Program or Federally Enforceable State Operating Permit Program.

4 Impose emissions standards for backup generators.

States can impose the most stringent EPA emissions standards requirements for backup generators.

Data centers can use nonroad generators that meet either a **Tier 2 or Tier 4 emission standard**, according to the EPA emissions classification. Tier 2 regulations are older emissions standards that result in higher air pollutant emissions, like NO_X and particulate matter (PM), than their Tier 4 counterparts. Tier 4 regulations require the NO_X and PM levels of diesel engines to be more than 90 percent lower than older tiers, and generators must have exhaust after-treatment systems. The majority of installed backup generators at data centers are Tier 2, however **data suggests** that newer and planned facilities are relying more heavily on Tier 4 diesel generators. In **Virginia**, for example, 2025 was the first year when more than half of newly-permitted backup capacity was Tier 4.

If states allow the use of fossil fuel-powered backup generators, they should enact requirements to meet or exceed EPA Tier 4 or equivalent emissions standards.

BACKUP POWER EMISSIONS STANDARDS EXAMPLES

Legislative

Colorado's **HB 26-1030** (2026, proposed) would have required that backup generators meet one or more of the following requirements, or at least "demonstrates reasonable effort to comply":

Diesel generators must meet or exceed EPA Tier 4 emissions standards, or Tier 2 emissions standards if they are equipped with certain "after-treatment technology."

Backup generation must be battery storage, biofuel or biodiesel, fuel cell or hydrogen fuel, natural gas, or ammonia, or other clean technology approved by a Colorado Data Center Development Authority created by the bill.

Legislative

Virginia's **HB 507** (2026, proposed) requires that, starting July 1, 2026, the Department of Environmental Quality can only issue an air permit for data centers if the emission limit for each engine-generator is less than or equal to the emissions profile of a Tier 4 equivalent engine-generator.

Regulatory

Oregon's **Tier 4 Streamlined Data Center Permit** incentivizes Tier 4 equivalent generators at data centers with streamlined permitting and shorter processing timelines.

STRATEGY FOUR

Take steps to reduce the need for utility-scale fossil fuel generation through demand-side solutions, flexibility, energy efficiency, and grid utilization.

Beyond how power is produced or procured directly for data center use, other types of solutions can address data center demand while limiting system-wide emissions. Certain resources, including distributed generation, demand-side management, load flexibility, and energy efficiency take advantage of technologies and practices available at the end-use customer level. This can include the data center itself or other residential, commercial, or industrial customers. By reducing pressure on the power system, this set of solutions can directly limit emissions while helping to avoid the extended use or construction of utility-scale fossil fuel generation.

Distributed generation, demand-side management, and energy efficiency have clear pathways for reducing emissions. Distributed generation, such as rooftop solar paired with home battery storage, directly provides an additional source of clean energy to the grid and displaces the need to run other generation sources. Reducing demand through energy efficiency or load management can also reduce emissions; the less power that is demanded, the less power must be generated and dispatched in order to serve that demand.

This can have an outsized effect on emissions, as removing even a small amount of load during peak demand periods can lessen or avoid the need to run the highest emitting and most expensive peaker plants. Reliably reducing demand when needed can also impact future resource planning, potentially avoiding new construction of fossil fuel plants.

States may also seek to reduce emissions through data center flexibility and improved grid utilization. Currently, the power system is built to **serve** peak levels of energy demand at times of high stress, representing only a small fraction of hours per year. This means that much of our energy infrastructure, particularly **transmission**, is underutilized for the majority of the year. By shifting the timing, location, or behavior of demand, the system can **unlock** a large amount of new capacity to accommodate large customers without needing as much incremental new generation or transmission capacity. This new grid capacity can also help bring clean energy resources online more quickly and reduce curtailment of existing renewable resources, reducing overall system emissions.

Importantly, while flexibility and improved grid utilization can save on costs through deferring or eliminating the need for new infrastructure, these strategies may actually **increase** emissions without careful planning. Data centers may make their system demand more flexible by adding behind-the-meter natural gas or, in places where it is allowed or required by law, running their diesel backup generators. Shifting load to avoid peak periods or constrained areas may actually increase the use of baseload power plants, which in many places means coal or gas. Therefore, states must be careful to structure flexibility and grid utilization programs to increase clean energy use and reduce emissions.

Strategies for reducing the need for utility-scale fossil fuel generation include:

1 Introduce pilots, programs, or requirements for data center efficiency or waste heat reuse.

Data centers can reduce their energy demand, and resulting emissions impacts, through changes to their non-computing operational characteristics. Unlike policies that impact data center energy consumption or compute operations, regulation of non-computing operations can be technology-neutral and align with data center developer interests to save on non-essential energy costs.

Enact standards for energy efficiency or power usage effectiveness (PUE)

One important metric for energy efficiency for data centers is power usage effectiveness (PUE). PUE measures the ratio of total energy usage by a facility to the power used by the data center's IT equipment (such as servers, data storage, networking equipment, etc.). The ideal PUE is 1.0, with larger values indicating more power being consumed by non-IT loads and great operational inefficiency. The extra load mainly comes from cooling and power delivery support systems, with some miscellaneous uses such as lighting. States can introduce PUE standards for new and existing data center operators to try to reduce overall energy demand.

POWER USAGE EFFECTIVENESS STANDARD EXAMPLES

Legislative

Germany's **Energy Efficiency Act** (2023, enacted): Among many provisions, this law requires data centers beginning operations before July 1, 2026 to achieve an annual average PUE of 1.5 by July 1, 2027 and 1.3 by July 1, 2030. Data centers that begin operations after July 1, 2026 must have an annual average PUE of 1.2 or less.

Executive

Australian Federal Government Data Center Standards (2025, enacted) implemented **requirements** for all data centers hosting federal government workloads a minimum five-star rating under Australia's environmental performance building standards, equivalent to achieving a PUE of 1.34.

Pursue data center heat recovery and reuse options

Because data centers must continuously cool their computing infrastructure, they produce a significant amount of excess heat. This is commonly exhausted as waste heat into the surrounding air environment, which can have unintended environmental consequences. Instead, this heat can be **harnessed** for beneficial purposes including agriculture, district heating, thermal energy networks, and electricity generation. While waste heat recovery does not directly impact a data center's own emissions, capturing and utilizing excess heat for other applications can displace emissions from other sectors, like buildings or industrial agriculture.

States can require waste heat reuse or recovery applications for data centers, especially for those over a certain size, or fund pilots or voluntary programs to encourage waste heat recovery applications. For more discussion of waste heat recovery as part of data center permitting and development, see Strategy 2.

WASTE HEAT REUSE EXAMPLES

Legislative

Virginia's **HB 323** (2026, enacted) directs the Virginia Department of Energy to accelerate the use of waste heat from data centers, including convening a working group that will present findings by September 1, 2026.

Legislative

Germany's Energy Efficiency Act (enacted, 2023) requires data centers operators to avoid waste heat in line with the best available technology and reduce waste heat to the least possible and reasonable technical level. Additionally, all data centers that begin operations after July 1, 2026, must achieve a share of reused energy (including recovery of waste heat) equal to 10 percent. This rises to 15 percent for data centers starting operations after July 1, 2027, and 20 percent for those starting after July 1, 2028.

2 Invest in off-site distributed generation and demand-side management resources that provide aggregated distributed capacity from other customers.

In addition to on-site improvements, data centers and utilities can procure distributed generation and load management from other residential, commercial, or industrial customers to serve or offset their demand. This may include distributed solar and storage, retail demand response programs, managed electric vehicle charging, smart thermostats and appliances, or aggregations of one or more technologies, often called "virtual power plants" (VPPs). At the same time, large-scale energy efficiency and weatherization efforts can also provide substantial energy and peak load savings, potentially eliminating up to **eight percent** of annual U.S. household electricity consumption per year by 2040.

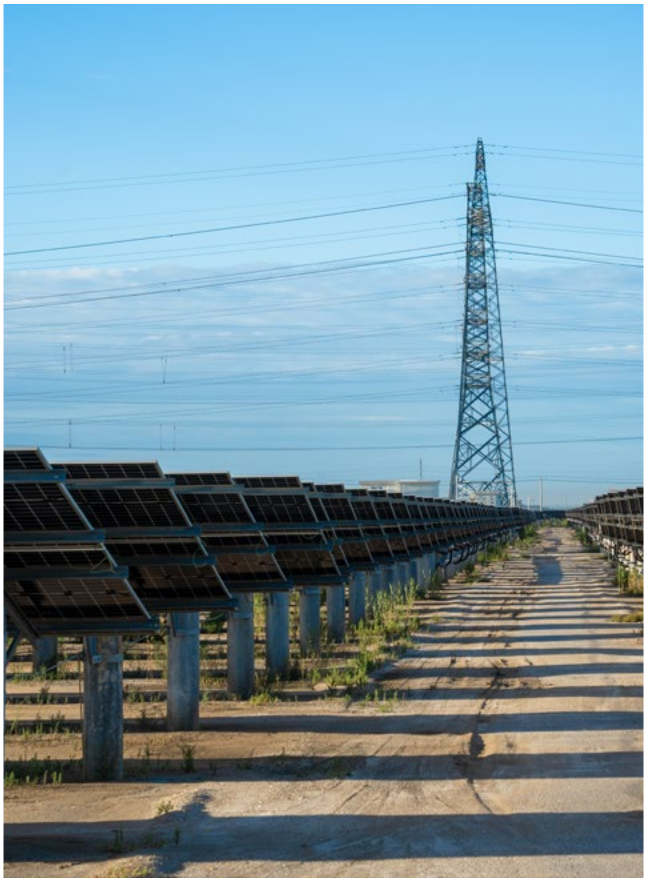
Energy efficiency and grid edge resources can be advantageous solutions to providing necessary large load capacity. These programs are often **significantly less expensive and quicker** to implement than building new supply-side resources. There is also significant room for growth: residential distributed energy resource (DER) capacity could increase to 96 GW by 2032. As with large-scale clean energy resources, policymakers should stake steps to ensure that energy efficiency and grid edge resources are additional and deliverable.

Strategies for increasing energy efficiency and grid edge resource deployment in response to data centers include:

Create programs for data centers to procure distributed capacity

Like with large-scale clean energy generation, data centers and other large loads may be able to fund deployment of distributed capacity. States should work to carve out options for data centers and other large energy users to support or procure this type of capacity, either through existing procurement options or new programs specifically targeting these resources.

States should consider how these options could be structured to provide maximum benefit to residential or commercial consumers participating in grid edge resource programs. While traditional distributed resources show direct benefits or savings on customer bills, procurement of distributed capacity by a data center may result in some or all of these benefits being assigned to the data center. Furthermore, demand response programs or managed distributed resources should not negatively impact service to residential customers. Therefore, states should ensure that utilities demonstrate that any plans for distributed capacity will result in real bill savings and reliability benefits for participants that provide the capacity through their generation or load reduction. States should also ensure that their regulators provide robust oversight of any programs, ensuring that utilities partner with reputable third-party vendors.



EXAMPLES OF PAYING OTHER CUSTOMERS TO PROVIDE FLEXIBILITY

Legislative

Virginia's **HB 284** (2026, enacted) directs the creation of "capacity reduction credits," defined as "a measured and verified standard unit of demand flexibility as approved by the [State Corporation] Commission." Using these credits, data centers may effectively pay other customers to reduce their power demand—whether through efficiency investments, curtailment, on-site batteries, or other means—in order to satisfy their own flexibility requirements.

Commercial

Google-Voltus Partnership (2026). In June 2026, Google announced that it would contract with Voltus, a virtual power plant and distributed energy resource operator, for 100 MW of aggregated distributed capacity a year in the PJM footprint. This partnership represents the first large-scale procurement of distributed capacity to help serve data center load.

Require data centers to contribute to funding energy efficiency, conservation, or weatherization programs

In addition to directly procuring capacity through grid edge resources, states can require that data centers fund energy efficiency initiatives for residential customers. This may be structured as a fee levied per data center, or as a surcharge applied per unit of electricity consumed by a data center on its bills.

States may consider different methods for calculating the fee or surcharge amount under this policy. This includes basing them on existing program budgets or target levels of energy efficiency or weatherization spending. Alternatively, states may base fees off of analysis of wholesale energy or capacity market price increases that can be attributed to data centers. States may also think about basing fees on estimated spending needed to offset a specific portion of energy demand increases from data centers.

Additionally, states may consider how funding contributed by data centers is spent to maximize local emissions savings and grid impacts. For example, states may choose to prioritize spending funds on projects in the town, city, or county hosting the data center. They may also direct funds specifically towards low-income customers, who are **more likely** to be energy burdened and live in **less-energy-efficient** households.

EXAMPLES OF PAYING FOR ENERGY EFFICIENCY, CONSERVATION, AND WEATHERIZATION

Regulatory

Portland General Electric **Schedule 96** (2026, approved) created a new tariff for large load and data center customers proposed by Portland General Electric. Customers with 100 MW or more of contracted demand must now pay a surcharge of one cent per kilowatt-hour in order to support "non-cost-effective [energy efficiency], critical home repairs [...], or distributed energy resources (DER) to insulate energy burdened customers."

Legislative

Minnesota **HF16** (2025, enacted) requires qualified large scale data centers above 100 MW to pay an annual fee to the state based on their contracted peak demand. The fee starts at $2,000,000 annually for data centers between 100 MW and 250 MW and rises to $5,000,000 annually for data centers over 750 MW. Proceeds from these fees go to a special revenue fund dedicated to low-income energy conservation and weatherization programs.

3 Explore models for facilitating data center demand flexibility through grid-responsive operations, co-located energy resources, or increased grid utilization.

Data centers serving computing workloads, as opposed to cryptocurrency mining, have traditionally been considered highly **"inflexible"** sources of energy demand. This means that their demand on the grid changes little regardless of electricity price, temperature, or other external factors. This is largely attributed to **high industry standards** for operational uptime (often described as "5 9's" or 99.999 percent reliability) and, increasingly, **high revenue potential** for AI services. However, as data center power consumption balloons and AI workloads demonstrate **more volatile** power consumption characteristics, many advocates and data center developers have been exploring ways to make computing and AI data center demand more flexible and responsive to grid needs.

States should ensure that flexible service options unlock the wide **variety** of flexible behaviors that data centers can perform. This could include reliance on co-located energy resources or storage or demand response based on temporal or spatial compute shifting. However, as discussed previously, states should be careful to ensure that provisions to increase flexibility do not inadvertently increase emissions through greater use of on-site generators or **increased fossil consumption** in the grid mix. This may include limiting or banning the use of large-scale behind-the-meter fossil fuel plants; encouraging greater grid utilization during times of the day when renewable energy production is high; or incentivizing on-site clean energy installations.

To enable flexibility in loads and reduce the need for generation and grid investments, states should consider multiple kinds of policies, such as:

Require demand flexibility options be offered for data center customers

Utilities often offer "interruptible" or flexible service options to commercial and industrial customers, whereby customers agree to reduce or temporarily stop their energy usage in exchange for lower rates or incentive payments. However, due to their high reliability needs, unique demand characteristics, and strong profit margins, traditional interruptible service models have been rarely used by data centers. States can require that utilities include interruptible, flexible service provisions or programs that account for data center demand characteristics in their large customer- or data center-serving tariffs. Participation in these programs may be voluntary or mandatory.

REQUIRING DEMAND FLEXIBILITY EXAMPLES

Legislative

Texas' **SB 6** (2025, enacted) requires the state's market operator to order utilities to create a protocol for curtailing non-critical large loads during emergency events. These protocols may include requiring a large load with backup generating facilities to deploy those facilities in lieu of or in combination with reducing demand from the grid.

Regulatory

Pennsylvania **Model Large Load Customer Tariff** (2026, approved) among other provisions, provides for interruptible service to large load customers and allows for utilities to offer lower minimum charges to large load customers that have on-site generation, in proportion with their ability to reduce demand from the grid.

Incentivize data centers to accept flexible service models through faster interconnection processes or incentive payments

Policymakers can pair the option to accept interruptible service with incentives to encourage the adoption of these programs. While bill credits or discounts have traditionally been common incentives to encourage behavior, the high opportunity costs and monetary resources of data center companies have made them largely agnostic to electricity prices at current levels. In contrast, speed-to-power has become a critical factor for data center development.

Due to the importance of speed-to-power for data center developers, this is a strong incentive for data centers to accept flexible arrangements either permanently or temporarily until the network upgrades needed to accommodate their full load can be completed. States may order utilities to develop new load interconnection study processes that reward the ability to provide certain levels of demand flexibility, such as through expedited permitting review. To further clean energy deployment, states can require these expedited interconnection options to include payments for supporting clean energy funds.

INCENTIVIZING DEMAND FLEXIBILITY EXAMPLES

Legislative

Virginia's **HB 284** (2026, enacted) requires major investor-owned utilities to propose a voluntary demand flexibility program for high energy demand customers over 25 MW by January 15, 2027. The legislation orders utilities to consider all forms of demand flexibility, specifically mentioning geographical or spatial shifting, dynamic voltage and frequency scaling, energy storage, and "methods by which high energy demand customers may be eligible to participate without directly curtailing their own electricity use." HB 284 also allows for the regulator to set incentives for participation, including "procedures for accelerated interconnection to service by participating high energy demand customers."

Incentivize on-site clean energy or storage as flexibility solutions

Another model for achieving greater flexibility for data centers is to enable co-located primary energy resources, which allow data centers to reduce their dependence on energy derived from the grid. While this model has gained traction since 2025, **most** plans for on-site, co-located energy resources still rely on natural gas.

To reduce emissions while taking advantage of the flexibility from co-located models, states can prioritize projects using clean energy and storage as co-located resources. Incentives may include expedited permitting or interconnection processes, particularly if the data center can be powered by on-site or local clean energy facilities. States should consider that not every data center location is suitable for large-scale solar or wind development, and that some projects may instead use more space-efficient modular battery storage.

For more discussion of on-site clean energy and incentives, including development models, reference Strategy 2 and Strategy 3.

Improve system utilization while maintaining emissions reductions as a priority

As previously discussed, improved grid utilization can help save on system costs by extracting more out of existing infrastructure. States can take steps to achieve greater grid utilization by requiring utilities to measure, report, and evaluate grid utilization metrics, as well as propose methods for improving system utilization in their jurisdiction.

However, there is **good evidence** to suggest that increased grid utilization may lead to greater use of existing fossil generation infrastructure. In areas with lower renewable adoption, shifting demand away from peak times may result in gas or coal facilities being run more consistently, resulting in greater emissions. States should therefore require utilities to show how improving grid utilization will decrease system emissions and promote the use of clean energy. For example, **shifting** flexible demand to times or places with high solar or wind generation can reduce curtailment of existing renewable resources and spur more renewable development.

GRID UTILIZATION EXAMPLE

Legislative

Virginia's **HB 434** (2026, enacted) directs utilities Dominion Energy and Appalachian Power to petition Virginia's energy regulator for approval of a set of "grid utilization" metrics. In turn, the regulator will evaluate these metrics, establish a timeline for Dominion Energy and Appalachian Power to increase grid utilization in accordance with these metrics, and report its findings and ways to use certain technologies to improve approved metrics to the governor and Virginia General Assembly.

4 Limit fossil fuel resource expansion or retirement delays specifically in order to serve data centers.

Across states, many utility regulators can authorize the construction of new power generation, the retirement of existing power generation, and the approval of longer-term plans for future resource expansion through integrated resource planning processes. As data center demand projections have grown, utilities and power producers have increasingly authorized the construction or expansion of natural gas plants, as well as delays in the retirement of older natural gas and coal plants: At least 37 **coal-fired generating units** have seen their retirement dates postponed directly because of increased demand.

States may seek to limit utility regulators from approving plans to construct or extend the life of fossil fuel resources specifically to serve data center demand. While this may not fully prevent new build or delayed resource fossil retirement, this approach would help to ensure that development is more in line with existing climate or clean energy targets and empower regulators and advocates to review decisions regarding fossil fuel resources.

Strategies for limiting this authority may include:

Requiring that approvals of new, expanded or extended fossil fuel generation to serve data centers will not otherwise undermine existing state renewable energy and emissions targets.

Requiring that approvals of new fossil fuel generation to serve data centers are limited to least-emitting sources.

Requiring that approvals of new fossil fuel generation specifically to serve data centers are conditional on showing that they are necessary to maintain grid reliability.

Requiring new fossil fuel generation is specifically paired to serve data centers with carbon capture.

Lastly, states can prohibit the approval of new fossil fuel fired generation specifically to power data centers. That step, however, may be widely perceived as **a ban on new data center development**, given the state of power demand and renewable development, and has not been proposed in statehouses to date. More common state proposals relate to imposing **a moratorium on data center approvals** until their generation needs and associated impacts on grid reliability have been studied.

LINKING DATA CENTER POWER TO EMISSIONS TARGETS EXAMPLE

Legislative and Regulatory

Oregon's **POWER Act** (2025, enacted) requires that when regulators approve tariffs for data customers, they must consider whether the tariff will "impede the electric company's ability to meet the clean energy targets set forth in ORS 469A.410 or reduce the emissions of greenhouse gases consistent with state policy." In 2026, in its decision on Portland General Electric (PGE)'s Schedule 96 data center tariff, the Oregon Public Service Commission **accepted** a proposal to implement a queue system that precludes service to a customer until PGE can reliably serve the customer without impeding its obligations under Oregon's clean energy targets. The Commission specifically referenced the POWER Act in deciding to authorize this queue system.

5

STRATEGY FIVE

Require analysis and transparency of data center impacts on greenhouse gas emissions or clean energy goals.

States have a variety of tools at their disposal to encourage data centers to disclose and study their own impacts, or fund state or third-party studies of those impacts.

States may require a study to be conducted of data centers at either the statewide, or the project level. At the statewide level, a legislature or agency can commission a study on data center impacts on the state's electricity mix and GHG emissions. States can also study the implications of each of these impacts on existing statewide GHG or clean energy targets.

At the project level, a study can be commissioned addressing the same impacts, with more detail on the specific generation, both on- and off-site, that will be deployed. Studies may also consider site-specific factors like the impact of the project on future renewable energy development, including access to transmission or rights-of-way. Completion of these studies can be made pre-conditions for receiving existing project approvals, or a new type of approval developed for this purpose.

With respect to transparency, states are increasingly proposing more comprehensive disclosures for both permitting and compliance. States can require annual disclosures of energy sources and their GHG-emissions (both on- and off-site), waste heat produced and utilized, as well as GHG mitigation efforts year over year, in order to track progress in minimizing data center emissions. Reporting requirements may also carry associated fines for noncompliance.

REQUIRING DATA CENTER STUDIES AND DISCLOSURES EXAMPLES

Legislative

Virginia's **SB 1448** (2025, proposed) commissions a study of data center impacts on existing statewide GHG or clean energy targets.

Legislative

Delaware's **SB 205** (2026, proposed) requires a study of the impact of data centers on future renewable energy development in the region.

Legislative

New York's **A.9086** (2026, proposed) requires annual disclosures of energy sources and their GHG-emissions, waste heat produced and utilized, as well as GHG mitigation efforts.

Legislative

Pennsylvania's **HB 2150** (2026, proposed) imposes a $10,000 fine for each day that required reporting is late, and direct penalties towards a low-income electric customer assistance program.

For more information on the types of disclosures and studies that states can require to better inform data center policy, see Climate XChange's **Transparency and Accountability Toolkit**.

Conclusion

Data centers are currently driving massive investments in the U.S. electrical system, but the types of investments will be informed by policy. State policymakers, as authorities over permitting and the retail electric system, have an important role to play in encouraging or mandating that data centers drive investments in clean energy or otherwise reduce their carbon impact. States can help shape what the data center market looks like over the coming years, and ensure that it is compatible with state energy and climate goals. They can do so by regulating how data centers generate their own primary or backup power, setting requirements for the types of power they purchase, creating conditions across the grid that reduce the need for new generation overall, and funneling data center projects to the physical locations with high technical potential for clean energy and efficiency.

While much data center growth has already occurred in recent years, much more is projected over the next decade. The decisions that state legislatures and regulators make in the next few years will be reflected in grid investments that last the next 30. This is a vital moment for policymakers to understand their policy options and be forward-thinking about the kind of grid and economy that they want to foster.

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One Beacon Street, 15th Floor, Boston MA 02108 | 617.624.0919