2025 Transition to the Future Grid in Massachusetts Event Series

Event 1 Report: Balancing Data Center Energy Use and Climate Goals

This report was compiled by Cole Triedman, Rapporteur for the 2025 Future Grid Event Series.

Introduction

This report summarizes the first event of the 2025 Transition to the Future Grid in MA Event Series ("Future Grid Series"), led by the Alliance for Climate Transition (ACT) and Massachusetts Clean Energy Center (MassCEC). The purpose of the series is to convene key Massachusetts stakeholders for critical conversations and collaboration, working towards designing actionable steps towards modernizing the state's energy grid. This report captures those steps as observations and recommendations to be referenced by state policy, regulatory and business communities. The 2025 events revisit and dive deep on priority issues identified in the 2024 Future Grid Series, which addressed incentive-based regulation, fostering the adoption of grid-tech, and grid planning.[1] The May 2025 workshop, hosted by Foley Hoag, brought together seventy-nine leading experts, practitioners and community stakeholders to address questions related to data center integration in Massachusetts.

This document is organized in sections as follows:

- *Has the data center boom come to Massachusetts?* This section introduces the workshop theme.
- *Visioning Session.* This section summarizes attendees' visions for data center integration in Massachusetts, as solicited from a brainstorming exercise.
- *Panels 1, 2, and 3*. These three sections summarize key outcomes of panel discussions that comprised much of the day. The initial discussion section overview benefits, burdens and open questions related to data center integration in Massachusetts as identified by workshop participants, while the 'discussion: policy options' section introduces emergent solutions to maximize benefits, minimize burdens and optimize any potential new data center development.
- *Discussion.* These two sections summarize the table sessions which presented attendees with key topics to discuss.
- *Recommendations.* This section offers three high-level recommendations that synthesize the workshop outcomes towards actionable steps for the state.
- *Appendix*. This section provides a list of the organizations represented in the series.

***Please note**: This document summarizes the content of and discussion during the Event among participants. A list of participating organizations is provided in an Appendix. As such, this document is not intended to represent the position of MassCEC or ACT.*

Has the data center boom come to Massachusetts?

The workshop kicked off with presentations by representatives from ACT, Foley Hoag, and MassCEC, who contextualized the Massachusetts data center conversation in terms of national trends and state policy. One introductory presenter described the magnitude of data center development – especially

[1] Summary of the 2024 Future Grid Series, *MassCEC*. https://www.masscec.com/resources/2024-event-series-transitioning-future-grid

hyperscale – as "eye popping." For example, a recent EPRI study found that 50% of utilities estimated that 10% or more of their 5-year peak will come from data centers.[2] In this context, states are moving quickly to design policies and regulatory requirements that attract, limit or direct development based on jurisdictional priorities. Clear best practices related to state strategy, policy and regulation are emerging and the subject of ongoing discussions.

Massachusetts is not an exception to the national data center boom. National Grid reports 2 GW worth of interest expressed by data center developers seeking to interconnect in the state. These projects introduce potentially significant implications and decisions for grid planners and communities. Were this new load to materialize, it could equate to approximately 8% of New England's current peak demand. These hypothetical new projects, which include hyperscale computing projects, would join the state's fleet of smaller data centers – several of which have been funded by state initiatives. Despite higher electricity rates and more limited space than other states, data center developers are reportedly interested in the state based on attractive tax incentives, water availability,[3] and other factors.

Developers' interest in Massachusetts comes amidst dynamic policy and social contexts. The state is prioritizing enhancing energy affordability to improve customer outcomes, in addition to continuing its work to reduce greenhouse gas emissions, planning for distributed energy and electrification, and managing resource adequacy. The details of how various data center development scenarios would interact with existing and emerging goals remains unclear. Presenters acknowledged this dynamic and noted that balancing the complexities of potential data center development will involve dedicated and intersectional leadership.

Visioning session

To ground and orient the conversation, the event included a "visioning session" to solicit participant perspectives regarding what data centers in MA look like if we "get it right". Participants populated a wall with sticky notes articulating their own ideas. The field of stakeholder visions for Massachusetts's data center landscape reflected the themes summarized in Table 1.

[2] Utility Experiences and Trends Regarding Data Centers: 2024 Survey, *EPRI*. https://www.epri.com/research/products/000000003002030643

[3] While abundant water availability has historically been a principal benefit of developing data centers in Massachusetts and New England, emerging engineering efficiencies like closed loop cooling systems are making data center operation less water resource intensive.

Table 1: Visions for the Massachusetts data center ecosystem

Theme	Examples
Economic development	Creating economic benefits for MA communities and residents, locally beneficial tax structures, creating family-sustaining and skilled clean energy jobs
Environmental impact	Low-or-no emission data centers, limit new diesel and gas, sustainable water use, limit harmful particulate emissions, limit impacts on biodiversity
Affordability	Equitable rate design, equitable cost allocation for grid upgrades, goal for AI to reduce rather than increase costs
Capacity	Requiring and scaling flexibility, requiring or incentivizing on-site generation, avoid triggering new capacity upgrades, regional coordination
Clean energy	New demand met by wind, solar and storage, economic benefits reinvested to stimulate offshore wind, co-located renewables to enhance resiliency
Optimized siting	Avoid overburdening communities, informing siting decisions with community input, requiring community buy-in, tying permitting to bringing energy supply
Procedural justice	Proactive community and stakeholder engagement, coordinated and state-led planning, clear state vision
Innovation	Partnerships with local startups and universities, support for grid modernization, stimulation of load flexibility and thermal looping, support climate tech/AI
Operations	Promote water and heat reuse, promote best-in-class energy efficiency, circular design
Policy leadership	Lead on flexible interruptible interconnection, lead on data center performance, serve as a model for other jurisdictions

Panel 1: Understanding data center loads and defining the challenge for Massachusetts

The first workshop panel built on initial speakers' introduction to the status of data center growth nationally and in Massachusetts, including data center impacts on state and regional infrastructure and policy. The panel featured:

- **Christine Stevens**. Key Account Manager, National Grid, who works closely with the utility's prospective data center customers.
- **Tory Clark**. Partner, E3, who leads load growth projection and modeling work.
- **Patrick Donovan**. Senior Research Analyst, Schneider Electric, who drives technology and engineering innovation in Schneider's data center energy and services practice.
- **Mike Jacobs**. Senior Manager, Union of Concerned Scientists (UCS), who advocates at the intersection of renewable energy interconnection and load growth primarily in PJM.
- **Alistair Pim** (panel moderator). Vice President of Innovation and Partnerships, Alliance for Climate Transition (ACT), and who plays a leading role facilitating the Future Grid Series.

Framing questions:

1. Why might we need data centers in Massachusetts? What is driving demand for data centers?
2. What is the role of artificial intelligence (AI) in driving load growth?
3. What is the magnitude of the data center challenge, nationally and in Massachusetts?
4. What do data center loads look like, and what challenges do they present to grid operators?
5. What is the impact of water use in data centers?

The panel discussion began by building out a fuller picture of data center growth nationally and in Massachusetts, including acknowledgement of uncertainties. The headline: after several decades of relatively stagnant load, the data center boom is driving potentially unprecedented load growth. Data centers are projected to demand 30-60 gigawatts (GW) of new electric load by 2035,[4] eventually demanding 7-12% of total domestic energy.[5] This growth is especially challenging to plan around due to uncertainties in load forecasting, evolving data center technological efficiencies, and unpredictably of data center developers' business decisions and double counting of projects that are 'shopping around' interconnection queues. Contextualizing the expansive variability between 30 and 60 GW as the result of load forecasting methodological decisions, one panelist admitted that you can often 'find a projection to match your worldview'. Whether data centers require 30 or 60 GW by 2035, panelists were clear about one thing: utility and distributed energy providers are scrambling for strategies to meet demand.

Massachusetts utility officials present at the workshop reported at least 2 GW of expressed interest for potential data centers in the state, spread across eight projects. Massachusetts may not be competitive compared to other states on electricity rates or available land, and the state utilities' ability to serve new hyperscale loads is further complicated by gas system constraints and uncertain timelines for offshore wind development. However, panelists discussed how new state tax incentives,[6] water access, low natural disaster risk, technologically skilled workforce and high-latency business customers (e.g., finance, biotech) in the state are all driving developer interest.

Turning to other jurisdictions' experiences and Massachusetts' policy goals, panelists discussed areas of alignment or misalignment between data center integration and state decarbonization and electrification as well as affordability goals. Panelists agreed that data centers will inevitably drive more fossil fuel use, with particular trepidation about new diesel backup generation being deployed in the state. However, they discussed continuous innovation in energy efficiency engineering (e.g., closed loop cooling systems), significant opportunities for data center demand flexibility and co-location of renewable energy and energy storage as potential opportunities to mitigate negative emission impacts. Panelists posed heightened concerns about the impact of data centers on electricity rates socialized across Massachusetts customers. Experiences from PJM and Virginia, in which major transmission and distribution (T&D) upgrades were bundled into the rate base with limited transparency, were framed as cautionary tales.

[4] Balancing Data Center Energy Use and Climate Goals panel discussion and event slide 13, *E3*.

[5] Balancing Data Center Energy Use and Climate Goals event slide 43, *Massachusetts Executive Office of Energy & Environmental Affairs (EEA)*.

[6] The Mass Leads Act ("An Act Relative to Strengthening Massachusetts' Economic Leadership") included a new sales and use tax exemption for data centers effective starting November 20, 2024. See https://malegislature.gov/Laws/SessionLaws/Acts/2024/Chapter238.

Panelists agreed that building out the state electric grid to accommodate large data centers will be expensive. While data centers in many jurisdictions may benefit from previously overbuilt T&D systems in the near term, significant incremental costs are expected to show up in the medium and long term. In this development scenario, rate modernization will be essential in Massachusetts and elsewhere to appropriately allocate costs and prevent undue cost-shifting onto non-data center customers.

Panel 2: Emerging technology solutions & opportunities

The second panel dove into the details of how data centers use energy and interact with the electric grid. The conversation bridged a cross-jurisdictional overview of existing models for data center energy use with discussion around innovative regulation and business models to drive cleaner and more flexible data center integration. The panel featured:

- **Ayse Coskun**. Director, Center for Information & Systems Engineering, Boston University and Chief Scientist, Emerald AI who leads research and developing tools to optimize data center demand flexibility.
- **Arin Kaye**. Research Lead, GHG Emissions Accounting and Strategic Applications, Energy Systems and Climate Analysis Group, EPRI, who leads research on greenhouse gas accounting and innovative utility data center tariff designs.
- **Tyler Norris.** J.B. Duke Fellow and PhD Student, Energy Systems, Duke University Nicholas School of the Environment, who researches bulk power systems and innovative approaches to large load interconnection.
- **David Arsenault**. Senior Vice President, AI Data Center Energy Storage Solutions, Skeleton Technologies, who specializes in data on power profiles associated with AI algorithms.
- **Adam Wade** (panel moderator). Partner, Foley Hoag, who works on a variety of legal issues related to scaling clean energy.

Framing questions

1. What existing state or federal regulatory frameworks or industry standards are currently driving data center energy performance?
2. There appear to be opportunities to optimize data center energy performance in at least 3 realms: at the chip and server level, the building scale, and regarding data center grid interactions. What technology innovations are emerging to optimize energy in these spheres?
3. What business model innovation is happening?
4. What best practices in data center design and operation are emerging to optimize data center power use?

The second panel discussion began with a level-set of how data centers access energy in various jurisdictions today. Prevailing energy service models include 1) power purchase agreements (PPA) or virtual PPAs in which a data center off-taker takes title to electricity generated by an electricity supplier, 2) energy supply agreements (ESA) in which a data center off-taker enters into a bi-lateral agreement with an electricity supplier under a general utility tariff, and 3) a data center-specific utility tariff, which

establishes prices and terms that a data center takes service from utility supply.[7] Preliminary research from across the country suggests that all three models are proliferating along with the data centers they enable. One panelist noted that large buyers have animated renewable energy markets through virtual power purchase agreements. Another panelist noted that data center renewable energy service becomes strained when capacity is needed during periods of higher loss of load expectation (LOLE, i.e., high demand and insufficient supply).

Given Massachusetts' ambitious policy goals around decarbonization and flexibility, discussion quickly turned towards strategies to potentially serve data center loads without causing significant emissions impacts or grid strain. Panelists candidly expressed that many potential avenues to build out clean energy at data center scale are tenuous. Next generation nuclear may not be commercially available until the mid 2030s; long-duration storage faces considerable backlogs augmented by supply chain constraints; the outlook for offshore wind development is suffering from federal policies. To avoid a situation where data centers drive construction of new gas peaker and combined cycle plants, behind-the-meter resources and demand flexibility will be critical bridge resources to any new data center development scenario.

Some panelists argued that the potential for data centers to provide demand flexibility is significant. Data centers can be flexible in their engineering design, often utilizing only 50-60% of their nameplate capacity with demand fluctuating aggressively on many time-scales.[8] They may also be extremely flexible in their response to grid access: with hyperscale data center revenues for computing often reaching 350x costs,[9] data centers are prioritizing expedient interconnection and willing to respond to price signals (or at least 'be polite' to jurisdictions willing to accommodate them). Some panelists argued that even a marginal amount of built in demand flexibility could mitigate significant data center grid impacts while being financially attractive to developers. Effective guidance could allow the state to move to a more predictable and controllable data center fleet. The core emergent question: how to drive this flexibility?

Panelists discussed how 'sticks' in the form of conditional interconnection agreements may be more effective than 'carrots' in driving data center flexibility. While data centers may be willing to enroll in demand response programs or grid services rate designs as a good faith gesture, panelists were clear that price signals will have limited organic impacts due to significant revenues associated with computing. What data centers developers really want is rapid grid access. For Massachusetts' policy and regulatory community, this could mean making new data center development contingent on 1) integration of defined behind-the-meter or purchased resources, and 2) institutional frameworks that require scenario-based demand flexibility. On the first concept, panelists pointed towards Ireland, which requires new data centers to co-locate energy storage that can charge and discharge based on grid

[7] Balancing Data Center Energy Use and Climate Goals event slide 30, *EPRI*.
[8] Balancing Data Center Energy Use and Climate Goals panel discussion, *Duke University*.
[9] Balancing Data Center Energy Use and Climate Goals panel discussion, *Skeleton Technologies*.

conditions. On the second concept, panelists framed that while a data center demand flexibility framework may not yet exist in the United States, work is underway to develop them. One panelist pointed towards Federal Energy Regulatory Commission's (FERC) co-location docket, which is defining service tiers that plan for various levels of interruptible service.[10] Several state legislatures are contemplating similar policies that make development conditional on projects advancing grid needs.[11] Could Massachusetts position itself as a national leader in data center regulation by proactively developing flexible interruptible tariffs that make data center interconnection contingent on predetermined demand flexibility? Notably, the pending Energy Affordability, Independence and Innovation Act (EAII) contains language that would take steps towards flexible interconnection.[12]

Relatedly, panelists framed a concept in which the state could take advantage of developers' willingness to pay for expedient interconnection as a revenue generation opportunity. Could the state implement an 'interconnection tax' mechanism that mobilizes developer capital to fund state future grid initiatives? One panelist referenced Nevada's Clean Energy Tariff, through which Google substantively pays for the development of advanced geothermal.[13]

To close the session, one panelist called the room to action: new data center integration without rigorous demand flexibility policies will lead to "massive fossil fuel expansion."[14] Perhaps the conversation should not center around 'what should Massachusetts do to attract new data centers' but rather how can Massachusetts pioneer institutional frameworks that minimize the state, national and global impacts of this unprecedented load growth.

Panel 3: Policy & people perspective

The third panel focused on the impacts of new data center integration in Massachusetts, with panelists offering perspectives and presenting the emerging analytical ecosystem outlining potential benefits, burdens, costs and externalities associated with new development. The discussion was oriented towards leveraging data and information from other states' experiences to build a state data center strategy that optimized development decisions with public policy priorities. The panel featured:

[10] FERC Orders Action on Co-Location Issues Related to Data Centers Running AI, *Federal Energy Regulatory Commission (FERC)*. https://ferc.gov/news-events/news/ferc-orders-action-co-location-issues-related-data-centers-running-ai

[11] These include Texas SB 6 (2025), Minnesota HF 2928 (2025), and Illinois SB 2181 (2025).

[12] This includes requiring large data centers to enter into interruptible service agreements, requiring enrollment in demand response programs, expanding curtailment testing requirements, expanding Electric Sector Modernization Plan (ESMP) scope to require utilities to develop flexible interconnection programs, etc.

[13] Balancing Data Center Energy Use and Climate Goals event slides, EPRI, slide 31. https://docs.google.com/presentation/d/1eSSaLh91jF2y4zp_5a8PVuiYvDrNeQ5r0GNS6XLY3PY/edit?slide=id.p#slide=id.p

[14] Data Center Energy Needs Could Upend Power Grids and Threaten the Climate, *Energy and Energy Study Institute*. https://www.eesi.org/articles/view/data-center-energy-needs-are-upending-power-grids-and-threatening-the-climate#:~:text=Data%20centers'%20projected%20electricity%20demand,further%20contribute%20to%20climate%20change.

- **Ashley Gagnon.** Senior Director, Federal and Regional Affairs, Massachusetts Executive Office of Energy & Environmental Affairs (EEA), who executes a range of federal and regional initiatives in coordination with state agencies and state partners on behalf of EEA.
- **Josh Ryor.** Assistant Energy Secretary, Massachusetts Executive Office of Energy & Environmental Affairs (EEA), who executes a range of energy and decarbonization initiatives on behalf of EEA.
- **Francesca Dominici.** Professor of Biostatistics, Population, and Data Science, Harvard T.H. Chan School of Public Health, who leads research mapping the public health impacts of data centers.
- **Aaron Lang.** Partner, Foley Hoag, an attorney who focuses on climate and clean energy matters.
- **Galen Nelson** (panel moderator)**.** Chief Climate Officer, MassCEC, who contributes to several MassCEC initiatives, including the Future Grid Series.

Framing questions

1. What state level energy and utility regulatory frameworks are being contemplated in other jurisdictions with regard to optimizing data center energy impacts?
2. Should battery energy storage replace backup diesel generator sets for data centers?
3. Are existing demand response programs adequate/appropriate to unlock load flexibility in data centers? What approaches are utility regulators considering in other jurisdictions to optimize data center impacts on distribution grids?
4. How can waste heat from data centers be recycled?
5. A substantial portion of AI related energy impacts are driven by individuals (using Chat GPT, for example). Do users have a right to know more about the energy and emissions impacts associated with AI use? What can be done to address this?
6. How can we use the data available to educate stakeholders in making sound decisions about data center siting and permitting?
7. How can we coordinate economic development planning and energy infrastructure planning?

Many workshop participants agreed throughout the day that the state of Massachusetts should play a role in broader efforts to manage new data center development. The third panel centered on the matrix of considerations that could factor into such a process, informed by data and stakeholder perspectives. The panel centered on the tools and information available to Massachusetts decision-makers to meaningfully evaluate the data center impacts, including benefits, burdens, costs and externalities. These include evaluation of water demand, cooling demand, electricity demand, pollution and health impacts, and socioeconomic information related to economic development and electricity costs.

The discussion began to overview data center burdens or benefits, matrices that would be built upon in the tabletop exercise later in the workshop. New data centers will generate noise, use electricity and water resources (driving up utility rates), and generate carbon and polluting particulate emissions.

One panelist presented research highlighting a disconnect in data center locational benefits and burdens. For example, a data center that serves industry in Boston may be driving pollution-based health impacts in nodes like Plymouth.[15] It was indicated that while hyperscalers may want to have a positive local impact, they could misallocate resources because of information gaps about adverse impacts. Conversely, data centers have the potential to generate positive economic development outcomes for the state and localities, though panelists voiced concern that they may not generate sustained benefits equivalent to other industries like advanced manufacturing.

Panelists introduced research led by research institutions to map these impacts geospatially, and contextualized how findings could guide the state. Massachusetts has nationally and globally leading research institutions and talent that can be deployed to model development scenarios, optimizing to maximize benefits and minimize burdens. Panelists stressed the importance of independence, neutrality and transparency in any state effort to generate research that informs policy decisions.

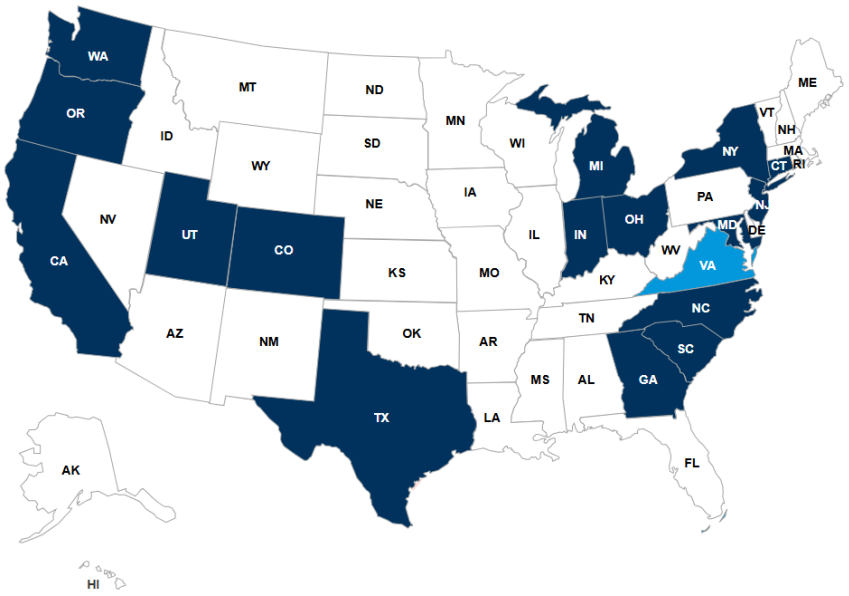
Panelists provided an overview of recent relevant legislation and legislative proposals, including the Mass Leads Act, which provides a tax incentive for data center development in the state, and the recently proposed Energy Affordability, Independence, and Innovation Act.

Panelists also discussed how Massachusetts can leverage policy approaches already developed or implemented by other jurisdictions. Figure 1, for example, indicates states with identified policy activity.[16] Other states are considering policy and legislation related to: cost responsibility and allocation; energy efficiency; load flexibility and demand response; bring-your-own energy; emissions limits and clean energy requirements; reporting requirements; and requirements to study the impacts of data centers.

[15] Balancing Data Center Energy Use and Climate Goals event slide 55, *Harvard University T.H. Chan School of Public Health*.

[16] Balancing Data Center Energy Use and Climate Goals event slide 48, *Massachusetts Executive Office of Energy & Environmental Affairs (EEA)*. States indicated in dark blue on the map, in addition to the U.S. Senate, are actively exploring or have passed data center provisions. Virginia, indicated in light blue on the map, has also explored similar provisions.

Figure 1: States exploring data center provisions



Panelists also discussed siting considerations for data centers, in the context of existing experience with siting other clean energy infrastructure and recent changes to MA siting processes. Geospatial data could be used to identify priority zones for development or clean energy deployment, giving decision-makers resources to think more proactively or strategically about energy infrastructure and economic development as they relate to data centers. There may be potential for the state Office of Energy Transformation or other agencies to lead efforts to prioritize new data center deployment that solves for grid constraints, optimizes the use of existing infrastructure and existing capacity, creates sustained economic development and offers opportunities for startups and industry to innovate. Panelists noted that based on its existing policy goals and informal 'values and principles', Massachusetts may ultimately be more interested in bringing in smaller 'distributed AI' centers rather than hyperscale data centers.

Discussion: benefits, burdens, and open questions

During the tabletop exercise, participants divided into small groups and discussed the benefits, burdens, and open questions of potential data center development. They also brainstormed policy, regulatory and technological strategies to maximize benefits, minimize burdens and align a state data center strategy with Massachusetts' public policy goals and principles.

Below are several prevailing examples of potential benefits discussed. As a note, several tables began this conversation with an open question – 'is this a useful conversation?' Some tables questioned whether there are any true benefits to siting new data centers in Massachusetts considering concerns around potential burdens. Conversely, advocates of data centers found consensus around the idea that new development in the state must be aligned with clear and measurable public purposes.

Table 2: Potential data center benefits for Massachusetts

Benefit	Explanation	Examples
Potential economic development opportunities	Opportunities to collect state and local tax revenues, attract innovation through startups and talent, create some job opportunities	- Opportunity to leverage and expand MA innovative manufacturing (e.g., superconductors, green cement) - Some towns are actively strategizing to attract data centers
Land and town revitalization	Opportunities for investment in rural and economically strained communities, usage of brownfields	- National Grid considering developing data centers in dried-up quarries, hazardous land - Community benefit agreements could ensure local benefits for small rural communities
Benefits of local AI computing	Local AI computing could result in more reliable, faster functions for local industries that use it, such as finance, biomedical engineering, healthcare, transportation.	- GPS and weather apps will see improved functionalities from local computing
Opportunities to catalyze flexibility and clean energy	Opportunities to accelerate implementation of flexible interconnection, large-scale demand flexibility, clean energy, microgrid and battery storage deployment	- Potential for flexible interruptible tariffs - Potential for battery co-location requirement or incentive (example: Ireland law)
Opportunities to catalyze or finance grid investment	Opportunities to design financial models that reinvest tax revenue into supporting grid investment	- Nevada data center tariff is paying for deployment of advanced geothermal - Identified MA needs for financial support with EV charging infrastructure, community-level fiberoptic
Increased energy security	Data centers, especially those sited at Department of Defense (DOD) facilities, could support critical facilities and functions	- There is demand for DOD-sited data centers in MA - Local AI computing enhances data security, privacy - Key industries like finance require low-latency data
Potential increased resilience	Opportunities for flexible operation to support connectivity during blackouts	- Data centers with DERs could serve as disaster relief centers during blackouts or export to local feeders

The prevailing concerns about new data center development centered around unclear societal benefits. Participants emphasized state and regional grid constraints, unclear community and economic development benefits, and significant potential costs to ratepayers and taxpayers. Part of the challenge with these potential shortcomings is the lack of clear data to illustrate or predict development outcomes

Table 3: Potential data center burdens for Massachusetts

Burden	Explanation	Examples
Contribution to demand constraints	Major demand from data centers could **increase pressure on already strained generation**, distribution and transmission infrastructure. Data center loads would compete with other policy-aligned load growth drivers like housing and electrification	- One data center could consume as much electricity as 100 affordable housing projects (EEA presentation) - Major generation investments like offshore wind are currently uncertain - Data centers may exacerbate capacity allocation challenges where regions and companies are competing for finite resources.
Reliability concerns	Data center operations are variable, potentially **causing demand swings that are problematic** for grid operations and fuel allocation	- Data center gas consumption could increase already volatile costs
Costs borne by ratepayers	Tax incentives created by the Mass Leads Act, as well as future T&D investments, **charge many data center integration costs to rate and taxpayers** with unclear benefits	- Transmission costs could be $1B to support 2 GW of MA data center integration - In the mid-Atlantic, allocation of data center transmission costs are causing regional disputes
Potential stranded costs	There are **risks of charging ratepayers for overbuilt infrastructure**, driven by data center "no-shows" and patterns of data center over-estimating load	- Data centers often 'shop' around multiple interconnection queues - Human and financial capital involved with interconnection studies is fraught if projects flake - Load over-estimations could trigger costly upgrades
Limited economic development outcomes	Data centers have **questionable long-term contributions to workforce development.** Impacts of short-term construction jobs on communities is uncertain	- Unclear/underdeveloped data on long-term employment opportunities created by data centers
Environmental externalities	Data centers have the **potential to undermine state climate goals** and **create concerning local and regional impacts** related to noise and air pollution, waste heat, and water quality	- Data centers will increase reliance on grid-scale and local fossil resources like natural gas and diesel. - Studies have demonstrated concerning public health outcomes related to data center air pollution
Environmental justice outcomes	Data centers are **historically sited in disadvantaged communities** with unclear local benefits	- No current examples of community benefit agreements or similar arrangements in MA
Land use tradeoffs	Large data centers will **occupy significant land and water resources**, raising questions about how those resources could be otherwise used	- MA has urgent priorities around developing affordable housing, a competing land use - Climate change may threaten abundant water supply
Supply chain constraints	Augmented by the current global macroeconomic environment, there are myriad **concerns about procuring equipment to support data center integration**	- Long-term battery storage, a highlighted option for clean data center integration, have 2-5 year queues - Transformer supply is similarly constrained

In light of these identified potential benefits and potential burdens, a core question permeated throughout the tabletop discussion and the day: **What type of new data centers should the state target and what, if any, conditions should Massachusetts place on data center deployment?** These fundamental questions sparked conversation about the state's next steps and how best to achieve the state's public policy goals.

The dozens of other specific questions discussed across the tables touched on identified benefits and burdens, as well as the mechanics and policy of potential data center development, interconnection and operation. Many stakeholders agreed that data center planning should be done with transparency and with public knowledge and input, but raised uncertainty about who or what entity (currently existing or not) should facilitate data collection, siting and other governance functions necessary to closely regulate data center integration. Similarly, questions around what type of regulatory approach is most appropriate extended throughout discussions. For example, what are the pros and cons of a consolidated and comprehensive data center rule to be developed by state entities like the Department of Public Utilities or in collaboration with MassCEC, versus a more piecemeal utility tariff design

approach? Finally, many participants expressed serious questions about how costs would be allocated, benefits measured and distributed, and externalities tracked.

Discussion: policy options

The tabletop discussion prompts guided participants towards identifying discrete policies, programs and regulatory initiatives that MA should pursue or investigate further. Considering a future where Massachusetts does allow new data center development, participants brought forward policy ideas that could maximize benefits, minimize burdens and prioritize communities. This section summarizes these ideas across the following categories: 1) governance, 2) data collection, 3) siting, 4) conditional incentives, 5) regulatory approach, 6) tariff design, 7) energy resources & co-location, 8) system upgrades, 9) operational requirements, 10) community economic development, 11) education & outreach, 12) regional collaboration.

Governance. *What entities will lead the development and implementation of a state data center integration strategy?* Raising concerns that state data center planning is currently occurring directly between developers and utilities, participants presented options for a state-led approach. There may be opportunities for the state legislature to assign authority and appropriate funding to a state agency or commission to further convene stakeholders, create partnerships and develop a data-driven state data center integration plan.

Data collection. *What data is necessary to analyze and make informed decisions about data center costs, benefits, impacts and optimization?* Many participants agreed with an overarching perspective that major development decisions should be made based on sophisticated and neutral data. This includes analysis and visualization of data related to economic costs and benefits, job creation, land use, and externalities. The state could fund or lead neutral data collection and the development of mapping tools. For example, it could leverage and expand on the data center public health impact studies led by Professor Dominici at Harvard's T.H. Chan School of Public Health, and mapping done by EEA's Office of Environmental Justice & Equity (OEJE)[17] and MassPort.[18]

Siting. *How can Massachusetts actors and policy ensure that data center siting is optimized to maximize benefits and minimize burdens?* Participants emphasized that the state's data collection and mapping priorities should directly factor into data center siting decisions. State authorities should, based on data analysis and stakeholder engagement, identify priority data center host use cases and plan around them. For example, data centers may be well-positioned to revitalize brownfield sites or other hazardous or abandoned land, or appropriate to site at Department of Defense (DOD) facilities. These

[17] Environmental Justice Populations in Massachusetts, *EEA Office of Environmental Justice & Equity (OEJE).* https://mass-eoeea.maps.arcgis.com/apps/MapSeries/index.html?appid=535e4419dc0545be980545a0eeaf9b53

[18] MassPort GIS Tool. https://www.arcgis.com/apps/mapviewer/index.html?webmap=53a7c63dea4f48e48e99d39f5c246829

use cases could be ranked by benefit/burden indicators and high-scoring sites could be designated as 'economic opportunity zones'.

Conditional incentives. *What data center use cases could warrant potential incentivization, and what would an incentive mechanism involve?* Participants generally agreed that Massachusetts should focus data center incentives on projects that squarely reflect the state's energy and environmental policy goals. Examples include deploying behind-the-meter resources and financial support from new data centers for new clean energy generation (see below); projects that pioneer demand flexibility (see below); offer opportunities to develop and pilot new technologies like waste heat recycling, clean cement, geothermal, and compute efficiency; and draw on the state's startup and university ecosystem to create partnerships and stimulate innovation. Many stakeholders argued that incentives should target smaller data centers clearly aligned with public interest, rather than hyperscale compute centers.

Regulatory approach. *What is the most effective strategy for Massachusetts regulators (especially the DPU) to approach questions related to data center integration?* State authorities could address regulatory questions related to potential new data center interconnection, outlined in the following ideas, through different approaches. For example, the Massachusetts Department of Public Utilities (DPU) could proactively open a consolidated and comprehensive data center regulation proceeding or respond to specific utility requests. Data centers may also require examination by other regulatory authorities including those managing air, water and noise pollution. Participants did not reach any consensus on an ideal approach but generally agreed that proactivity should be a priority.

Tariff design. *What approaches to tariff design would maximize benefits and minimize burdens?* Nationwide, data centers are driving the development of new and/or updated tariffs. Participants expected the same to be necessary in Massachusetts, where the terms of data center-grid interactions are still being defined and stakeholders are seeking information to inform business decisions. Participants offered a range of data center tariff functions: implementing higher rates, enabling demand flexibility (see below), clarifying cost allocation of necessary upgrades (see below), requiring a resource adequacy permit for high frequency load, or establishing a financial commitment for developers to access an interconnection study. Several participants recommended a proactive approach to data center tariff design, rather than in response to utility requests.

Energy resources & co-location. *Should data centers be required to contribute to serving their own energy demand, and should they be required to use clean and/or flexible energy?* Unprecedented energy demand dominated conversation as a primary concern about new data center interconnection. Many stakeholders agreed that data centers should be expected to bring new energy resources with them through co-location, power purchase agreements (PPAs) for offsite resources, required incremental offset REC purchasing, or other models. Pointing towards models in other jurisdictions (e.g., Ireland), many stakeholders believed these resources should be clean or low-carbon, and incorporate energy storage. This outcome could be realized through interconnection requirements, or opportunities for

developers to access tax breaks or jump interconnection queues if they serve a defined percentage of load with eligible resources.

Operational flexibility requirements. *What requirements or incentives should Massachusetts establish around data center resource adequacy and load flexibility?* Modeling shows that data centers, which often utilize a fraction of their nameplate capacity, may be capable of providing significant demand flexibility to address resource adequacy concerns. Participants suggested that data centers are particularly interested in exercising this capability if it grants expedited interconnection access (compared to a secondary value proposition related to event-based demand response compensation). Participants emphasized that proactively designing a flexible interruptible tariff that assumes a certain amount of flexibility could be a game changer for future data center integration in Massachusetts.

System upgrades. *Can cost allocation principles and/or reinvestment mechanisms be implemented to ensure that T&D upgrades and grid modernization investments are funded by developers?* Accommodating new data center loads would require substantial investment in the transmission and distribution systems. A critical part of prospective data center interconnection tariffs, as argued by many participants, would be designing a cost allocation mechanism that ensured developers (as opposed to ratepayers) pay their fair share of necessary investments. Several participants further envisioned a mechanism in which heightened data center rates or tax revenues were collected into a fund and reinvested into grid modernization initiatives.

Community economic development. *How can tools like tax structures, community benefits agreements, or labor requirements ensure that economic development benefits are locally generated and sustained?* While many participants expressed concerns about community burdens of data centers outweighing benefits, several framed tools to ensure envisioned benefits were tracked and realized. One such tool is community benefits agreements (CBAs). The state could play a role in ensuring that data center CBAs are legally enforceable and provide a template-based approach for towns and municipalities to leverage in negotiations. Similarly, state authorities could consider a policy that requires union labor on data center construction and maintenance or makes interconnection conditional on sustained job creation.

Education & outreach. *What strategies can ensure that stakeholders have resources to stay informed and be heard about data centers?* Most participants agreed that state agencies should play a role in educating stakeholders and the public about the potential benefits, burdens and impacts of both data center development and AI use. This priority could be aligned with data collection priorities and integrated into a broader stakeholder engagement strategy.

Regional collaboration. *What are the most appropriate venues to coordinate regionally on a data center integration strategy?* Large data centers affect regional transmission infrastructure and resource adequacy, reason enough for many participants to stress a need for regional coordination. One participant noted that the Executive Office of Energy & Environmental Affairs (EEA) already has set up a process with ISO-NE to proactively plan upgrades and buildouts, while emphasizing the early status and

potential limitations of that process. Participants discussed potentially creating a new group hosted by ISO-NE, NECPUC, or other regional entities to discuss and advance regional data center planning.

Table 4: Summary of data center policy ideas

Topic	Guiding Question	Policy Idea(s)
Governance	What entities will lead the development and implementation of a state data center integration strategy?	Empower a state agency or commission to lead further convening, develop a state data center plan
Data collection	What data is necessary to analyze and make informed decisions about data center costs, benefits, impacts and optimization?	State funds or develops neutral data collection, mapping tools
Siting	How can Massachusetts actors and policy ensure that data center siting is optimized to maximize benefits and minimize burdens?	State ranks potential data center sites based on benefits and burdens, prioritizes land revitalization
Conditional incentives	What data center use cases could warrant potential incentivization, and what would an incentive mechanism involve?	Incentivize smaller projects that incorporate clean and flexible energy, pilot new technologies, and draw on research partnerships
Regulatory approach	What is the most effective strategy for Massachusetts regulators to approach questions related to data center integration?	Consider proactively hosting a data center technical session, opening investigation
Tariff Design	What approaches to tariff design would maximize benefits and minimize burdens?	Consider examining data center interconnection tariff design as part of regulatory process
Energy resources & co-location	Should data centers be required to contribute to serving their own energy demand? Should they be required to use clean, flexible energy?	Opportunity for developers to jump interconnection queues if they serve their own load with flexible clean energy, storage
Operational requirements	What requirements or incentives should Massachusetts establish around data center resource adequacy and load flexibility?	Proactively design a flexible interruptible tariff that guarantees demand flexibility in exchange for expedited grid access
System upgrades	Can cost allocation principles or reinvestment mechanisms be implemented to ensure that T&D upgrades and grid modernization investments are funded by developers?	Develop data center interconnection tariff with clear cost allocation principles, develop grid modernization reinvestment fund using rate or tax revenues
Economic development	How can tools like tax structures, community benefits agreements, or labor requirements ensure that economic development benefits are locally generated and sustained?	State creates a community benefits agreement (CBA) template, interconnection conditional on job growth benchmarks
Education & outreach	What strategies can ensure that stakeholders have resources to stay informed and be heard about data centers?	State leads campaign to inform public about data center benefits, burdens and impacts
Regional collaboration	What are appropriate venues to coordinate regionally on a data center strategy?	Create a new regional data center planning group out of ISO-NE or NECPUC

Recommendations

Recommended actions emerged from the many policy ideas presented by workshop participants, related to planning, regulation, and outreach.

1. **Gather information** (governance, data collection, siting, conditional incentives). As a first step, the Commonwealth should consider identifying a leading entity or task force to conduct initial neutral information-gathering. This effort could be scoped to resolve open questions and more clearly illustrate potential data center benefits and burdens identified in the workshop. The Commonwealth could then develop a data-driven approach to future planning, programmatic or other activities led by state agencies and authorities. In particular, this information gathering could be used to design appropriate conditions to apply to existing or future state incentives for data center deployment.

2. **Scope regulatory pathways** (regulatory approach, tariff design, co-location, operational requirements, system upgrades). The DPU and ISO-NE, in collaboration with Municipal Light Plants and a set of informed and resourced stakeholders, should consider hosting technical sessions on data center regulation. These sessions should address the specific set of regulatory questions and policy ideas framed by the outcomes of this workshop. Regulatory leaders could use this process to develop a prioritized list of the regulatory steps needed to scope any necessary investigations, rulemakings or other proceedings.

3. **Engage communities** (economic development, education & outreach). Informed by the results of actions introduced by Recommendation 1, state agencies and authorities should develop plans for community engagement to help empower communities to make informed decisions about data centers and leverage potential benefits. Such a planning process should involve direct outreach to Massachusetts communities, especially listening and resource-sharing sessions with potential data center host communities. In parallel, authorities should work with communities to co-develop proactive protection plans and template community benefits agreements (CBAs).

***Please note**: This document summarizes the content of and discussion during the Event among participants. A list of participating organizations is provided in an Appendix. As such, this document is not intended to represent the position of MassCEC or ACT.*

Conclusion

The first event of the 2025 Future Grid Series brought together stakeholders around the complex question of what type of new data centers the state should target and how data center development could reflect the state's energy and environmental policy goals. The day-long event spurred discussion and debate about data centers and surfaced clear and actionable next steps for state entities, businesses and stakeholders. An opportunity exists for the state to develop a comprehensive data center vision and strategy that incorporates data, stakeholder perspectives, conditional incentives and regulatory mechanisms at the bleeding edge of the data center boom. Further, to the extent that data center development moves forward in Massachusetts, the state can move forward on gathering

information and advancing processes to develop no-regrets policy mechanisms like flexible interruptible tariffs and a grid reinvestment mechanism.

Appendix: List of Participating Organizations

Note that this list includes all organizations with at least one registrant. Some organizations had multiple registrants, and some registrants may not have attended.

Alliance for Climate Transition (ACT)
2050 Partners
Auroral LLC
B2Q
Better Future Project - 350 Mass
Bloom Energy
Boston University, Emerald AI
British Consulate-General, Boston
City of Boston
City of Lawrence
Cleantech Open Northeast
Climate Salon
Commonwealth Climate Coalition
Community Labor United
Converge Strategies, LLC
Daymark Energy Advisors
DNV
Duke University
E2SOL LLC
E9 Insight
Ecoloop
Energy + Environmental Economics, Inc.
EPRI
Eversource
FM
Foley Hoag LLP
Green AI Institute
Greentown Labs
Harvard University
Harvard Kennedy School
Hitachi Energy
Innoenergy
ISO New England
Latitude Media
MA Department of Public Utilities
MA Executive Office of Energy and Environmental Affairs
MA Department of Energy Resources
MA Municipal Wholesale Electric Company
MassCEC
Massachusetts Green High Performance Computing Center
National Grid
New Ecology Inc.
New Lead Energy
Next-Gen Grid Infrastructure
PowerOptions
Prezerv
RDS
Rhode Island Energy (PPL)
Ridgeline Strategy
Schneider Electric
Sierra Club
Skeleton Technologies
Smart Electric Power Alliance
Solect Energy Development
STV Inc.
Suffolk Tech
The Cadmus Group
TSK Associates
Urban Land Institute Boston
UMass Amherst
Union of Concerned Scientists
United Civil
VEIR
Walker-Miller Energy Services