



Team Pennsylvania's Energy, Data Center, and Artificial Intelligence Roadmap

Last Updated: September 2026

CONTENTS



<u>Executive Summary</u>	3
<u>Vision and Strategic Goals (by 2035)</u>	6
<u>Roadmap Drivers</u>	13
<u>National and Pennsylvania Context</u>	14
<u>Important Dynamics and Considerations</u>	19
<u>Near-Term Actions (2025–2027)</u>	34
<u>Long-Term Strategies (2025-2035)</u>	39
<u>Roles and Enablers</u>	44
<u>Data Centers and AI in Action: Real Benefits for Pennsylvanians</u>	46
<u>Phased Roadmap Timeline with Milestones: Immediate Actions</u>	48
<u>Phased Roadmap Timeline with Milestones: Mid-Term Actions</u>	49
<u>Phased Roadmap Timeline with Milestones: Long-Term Actions</u>	50
<u>Team Pennsylvania Commitments</u>	51
<u>Organizations, References, and Appendices</u>	53
<u>Frequently Asked Questions</u>	57

Executive Summary:

Pennsylvania's Unique Opportunity to Lead in Energy Transformation and Data Center Expansion in the Artificial Intelligence (AI) Age

Pennsylvania is at a pivotal crossroads in energy transformation, data center expansion, and artificial intelligence (AI). These converging forces represent both an urgent challenge and an extraordinary opportunity for the Commonwealth to lead, adapting to rapid change, and shaping its future. This roadmap outlines a shared, strategic path forward, designed to secure Pennsylvania's position as a powerhouse of innovation, economic resilience, and broad-based prosperity.

At its core, this roadmap is a call to coordinated action. The energy sector is being tested to deliver with innovation, speed, and resilience. Data centers are multiplying, bringing surging demand for firm, scalable, and sustainable power. AI adoption is accelerating across industries. Pennsylvania's assets – its universities, energy mix and infrastructure, industrial base, and strategic geography – uniquely position the state to respond decisively. Success will depend on building capacity, speeding infrastructure deployment, and aligning stakeholders around a common vision.

Pennsylvania needs to signal serious intent, beyond the headlines. We need to evidence our capabilities through certainty and predictability, visible momentum, and credible commitments, all combined with strong collaboration and early wins.

Vision for Pennsylvania

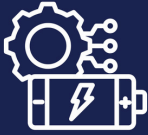
Pennsylvania will take bold action and work together, across sectors, to turn rapid technological change into lasting economic growth for communities across the state.

Vision for the EDCAI Roadmap

This roadmap positions Pennsylvania to lead in the age of artificial intelligence. Artificial intelligence and the systems behind it are transforming how we work, live, and grow our economy. With bold goals and flexible strategies, we can shape these forces to benefit every region of the state.

This document presents a bold yet practical framework organized around six strategic goals to be achieved by 2035:

#1



LEAD THE NATION IN AI-APPLIED AND NEXT-GENERATION ENERGY SYSTEM TRANSFORMATION,

ensuring that AI not only consumes energy, but also advances how it's generated, stored, and distributed

#2



LEAD THE NATION IN AI AND NEXT-GENERATION TECHNOLOGY COMMERCIALIZATION

from higher education R&D, private-sector innovators, startups, and scale-ups

#3



DEPLOY SCALABLE, FIRM ENERGY GENERATION — TARGET OF 10-12 GW—

to support emerging industrial and compute infrastructure

#4



ESTABLISH 3-5 INNOVATION CORRIDORS

across Pennsylvania's rural and urban landscape anchored by energy-enabled, AI-powered development

#5



MODERNIZE GRID INFRASTRUCTURE AND PERMITTING

to meet the demands of next-generation data and energy needs

#6

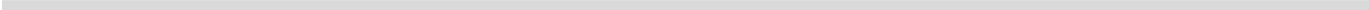


SET A STRATEGIC TARGET FOR PENNSYLVANIA-BASED SOURCING TO REACH 20% OF TOTAL SPEND

in AI-powered data center and grid infrastructure projects by 2035

This roadmap is not a siting guide or regulatory document. It is a forward-looking strategy grounded in Team Pennsylvania's model of public-private collaboration. Its development reflects a shared recognition that Pennsylvania has the credibility, diversity of resources, and urgency to lead—yet it must act decisively, collaboratively and strategically.

The roadmap is informed by the realities of a rapidly shifting national context. Federal priorities and private capital are moving in lockstep to scale AI infrastructure. Grid operators are revising forecasts upward to accommodate exponential increases in electricity demand. Major firms are seeking states ready to align energy readiness with technology leadership. All while technological innovation is changing specifications and key supply chain elements are experiencing long lead times.



Team Pennsylvania's response is both clear-eyed and optimistic. This roadmap's intention is to lift up every region, from the AI and life sciences clusters in Pittsburgh, and energy R&D in State College, to Philadelphia's life sciences corridor and the foundational assets of rural communities stretching from Erie to Bellefonte to Wayne County. Rural regions offer more than energy resources as they are the test beds for agricultural innovation, advanced manufacturing, and talent potential that is essential to the Commonwealth's future. This roadmap reinforces a whole-of-Commonwealth approach, championing readiness across sectors and geographies.

Ultimately, this roadmap invites collaboration, though not necessarily consensus. It outlines a framework for where Pennsylvania can go and how it can get there. By building long-term momentum and advancing near-term wins, the Commonwealth can transform this moment into a defining decade of economic and technological leadership.

Vision and Strategic Goals (by 2035)

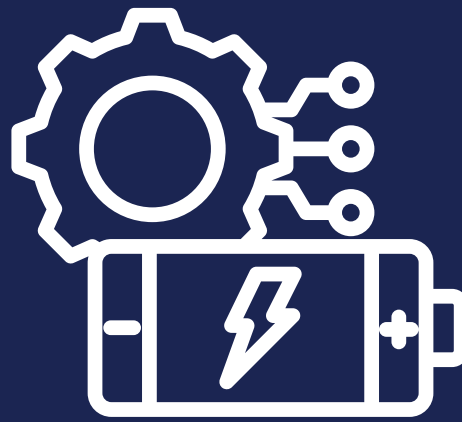
Vision for Pennsylvania

Pennsylvania will take bold action and work together, across sectors, to turn rapid technological change into lasting economic growth for communities across the state.

Vision for the EDCAI Roadmap

This roadmap positions Pennsylvania to lead in the age of artificial intelligence. Artificial intelligence and the systems behind it are transforming how we work, live, and grow our economy. With bold goals and flexible strategies, we can shape these forces to benefit every region of the state.





#1 LEAD THE NATION IN AI-APPLIED AND NEXT-GENERATION ENERGY SYSTEM TRANSFORMATION

ENSURING THAT AI NOT ONLY CONSUMES ENERGY, BUT ALSO ADVANCES HOW IT'S GENERATED, STORED, AND DISTRIBUTED

Current Context: Pennsylvania is already an energy leader with one of the largest shale gas basins in the world, the second-largest nuclear fleet in the US, and growing renewable and clean energy assets. As AI increases demand for firm, reliable power, Pennsylvania has the chance to marry its energy strengths with AI enabled solutions for grid management, energy efficiency, and system resiliency.

Potential Game Changer: Deploying AI-enabled energy management at scale, including predictive analytics for grid operations, optimized siting for new generation, and next-generation demand response solutions, would position Pennsylvania as a global leader in energy/AI convergence. Early pilots tied to data centers could demonstrate feasibility and exportable expertise.

Key Metric: Percentage of Pennsylvania's grid operations utilizing AI-enabled forecasting and management tools (with targets for adoption by PJM and utilities), and reductions in interconnection approval times or outage durations attributable to AI tools.



#2 LEAD THE NATION IN AI AND NEXT-GENERATION TECHNOLOGY COMMERCIALIZATION

FROM HIGHER EDUCATION R&D, PRIVATE-SECTOR INNOVATORS, STARTUPS, AND SCALE-UPS

Current Context: Pennsylvania is increasingly on the AI map. With seven R1 universities, the Pittsburgh Supercomputing Center, and a broad and deep network of other public and private higher education institutions spread throughout the state, considerable AI R&D already is taking place. The highest AI cluster is in the Pittsburgh region anchored by Carnegie Mellon University with notable private sector companies garnering national and global headlines and driving talent attraction. Philadelphia, with its burgeoning life sciences muscle, is accelerating the pace of medical discovery through applied AI. Pennsylvania's state government was recently recognized by Code for America as one of the top 3 states for AI usage, training and capacity building in state government.

Potential Game Changer: Shared, centralized R1 super-computing power to meet the extraordinarily significant data and capital requirements, along with shared research instruments, commercial cloud, experimental technologies, leveraging the national research computing and data ecosystem.

Key Metric: Growth in venture capital investment in Pennsylvania AI and advanced technology start-ups (tracked by Pitchbook/CB Insights), with 2x current levels by 2030. Supplement with tracking of technology licenses and spinouts from universities.



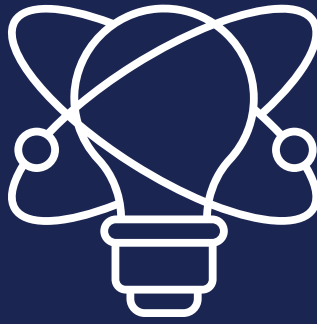
#3 DEPLOY SCALABLE, FIRM ENERGY GENERATION — TARGET OF 10-12 GW

TO SUPPORT EMERGING INDUSTRIAL AND COMPUTE INFRASTRUCTURE

Current Context: Data centers and advanced manufacturing facilities require reliable, around-the-clock energy. PJM currently faces a tightening capacity market, with coal retirements and new load growth stressing the system. Pennsylvania has the resource mix to expand generation but faces permitting and interconnection bottlenecks.

Potential Game Changer: Pennsylvania positions itself as the first state to demonstrate an “all-of-the-above” scalable model for firm power.

Key Metric: Total GW of new, firm capacity added in Pennsylvania dedicated to industrial and compute load, with a rolling target (e.g. 5-7 GW by 2030, adjusted annually for demand forecasts).



#4 ESTABLISH 3-5 INNOVATION CORRIDORS

*ACROSS PENNSYLVANIA'S RURAL AND URBAN LANDSCAPE, ANCHORED BY
ENERGY-ENABLED, AI-POWERED DEVELOPMENT*

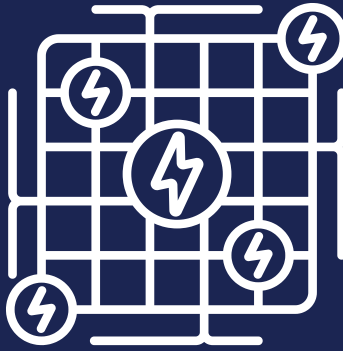
Current Context: Pennsylvania's innovation economy is deeply regional. Pittsburgh anchors world-leading expertise in AI, robotics, and advanced manufacturing while also building a burgeoning life sciences cluster connected to its health systems and research institutions. Philadelphia continues to expand its leadership in biotech, pharmaceuticals, and applied AI in life sciences, positioning the city as one of the nation's fastest-growing health innovation hubs. State College and surrounding areas provide strength in materials science, agriculture, and energy research, while the northeast-Lehigh Valley, the northwest, anchored by Erie, and central Pennsylvania, bring resource-rich energy corridors and emerging tech manufacturing footprints.

Despite these assets, the Commonwealth's innovation economy remains uneven. Pennsylvania is ranked 15th in Milken Institute's 2022 State Technology and Science Index, placing it in Tier 2 nationally. While the state performs strongly in research and risk capital inputs, it lags in technology talent density and tech sector concentration. By intentionally developing regional innovation corridors, Pennsylvania can connect these complementary strengths — energy, AI, robotics, and life sciences, while addressing gaps in talent and technology diffusion.

Potential Game Changer: Create designated Regional AI Activation Corridors supported by “communities of practice” that integrate universities, health systems, advanced manufacturing, and energy development. By clustering and aligning investments across regions with a specific emphasis on AI adoption and R&D, these corridors can accelerate knowledge spillover, talent retention, and commercialization.

Key Metric: Net new jobs in AI, automation, and advanced technology occupations created within designated corridors, paired with median wage growth compared to statewide averages. Track corridor performance using Milken-aligned indicators:

- Tech Concentration and Dynamism (TCD): growth in high-tech and life sciences employment, startup formation, and regional business expansion.
- Technology and Science Workforce (TSW): increase in specialized STEM and health innovation occupations per capita within corridor regions.



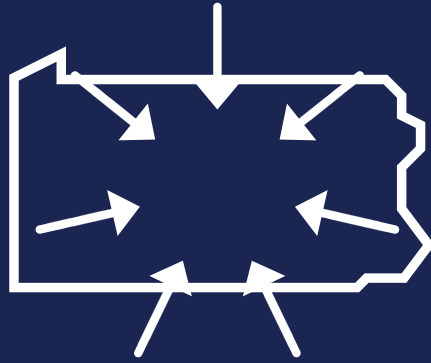
#5 MODERNIZE GRID INFRASTRUCTURE AND PERMITTING

TO MEET THE DEMANDS OF NEXT-GENERATION DATA AND ENERGY NEEDS

Current Context: Pennsylvania's grid faces aging infrastructure, a backlogged interconnection queue, and uneven permitting processes across municipalities. These barriers slow down both energy and data center development. To date, early signs of success are coming from Pennsylvania's Office of Transformation & Opportunity (PA OTO) through its PA Permit Fast Track Program. A specific example is Project Hazelnut, a 1,300-acre advanced technology campus featuring utility-grade server rooms, power distribution, cooling systems, and resilient network infrastructure, where PA OTO is streamlining interagency coordination and permitting timelines.

Potential Game Changer: A statewide permitting overhaul tied to grid modernization, including bundled approvals, standardized local zoning templates, and AI-assisted permitting, that cuts project timelines by 30-50 percent compared to today.

Key Metric: Reduction in average interconnection and permitting timelines for major projects (measured in months), and percentage of new projects processed through standardized permitting pathways.



#6 SET A STRATEGIC TARGET FOR PENNSYLVANIA-BASED SOURCING TO REACH 20% OF TOTAL SPEND

*IN AI-POWERED DATA CENTER AND GRID INFRASTRUCTURE PROJECTS
BY 2035*

Current Context: Pennsylvania has a strong manufacturing base in transformers, switchgear, and other electrical equipment, but the majority of supply chain for advanced components still sit outside the state or abroad. The national transformer backlog underscores the need to localize production.

Potential Game Changer: Launch of an AI Manufacturing Scaling Initiative that connects Pennsylvania's small and mid-sized manufacturers to AI adoption tools and supply chain opportunities, allowing them to scale into suppliers for data center and grid infrastructure.

Key Metric: Percentage of total project spend on energy and data center infrastructure sourced from Pennsylvania-based firms, with a goal of reaching 20% by 2035.

Secondary Metric: Percentage increase in the number of enterprises in Pennsylvania, adopting AI-enabled manufacturing processes to serve this market, with a goal of more than 150% by 2030 given the current rapid pace of AI adoption broadly.

Roadmap Drivers

Team Pennsylvania approaches the convergence of energy transformation, data center expansion, and artificial intelligence, embracing the organizational goals that drive all of our work: collaboration, leadership, impact, and empowerment. This roadmap is not a prescriptive regulation, a technology catalog, or a siting guide. It is a forward-looking, action-oriented, and inclusive framework intended to organize stakeholders around shared priorities while recognizing that the complexity of the moment requires agility, engagement, and an openness to debate.



Through this roadmap, Team Pennsylvania lifts up its role as a trusted convener and catalyst focused at a state level.

We invite leaders from business, labor, academia, government, and nonprofit organizations to engage with the framework, challenge assumptions, and identify the next steps we can take together. By doing so, we position the Commonwealth not just to adapt to the AI era, but to help define it, ensuring that innovation, energy leadership, and broad-based prosperity move forward in concert.

The pace of change demands that we act now or risk having Pennsylvania left behind, as none of this work is easy and will take time. This is what we know: **AI adoption is accelerating.** Energy demand is climbing within the state and more broadly in our region. Infrastructure pressures are converging. There should be no debate that this lay of the land is a fair assessment.

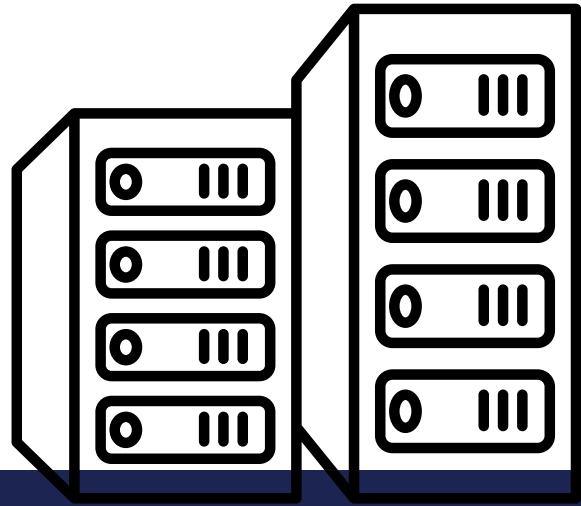
Aspects of this roadmap are bold and may feel provocative. We aim to shift what feels like a chorus of disconnected discussions covering large and complex topics to key actions, accelerating progress where Pennsylvania has the capacity to make a difference. We acknowledge there are sizable boundary lines between what is within, and not within, anyone's control. For example, Pennsylvania can act decisively in areas such as permitting, cross-sector coordination, and talent preparation, while recognizing policies, markets, and infrastructure systems are at a national or global level—changing even as this document is being drafted.



This roadmap embraces a bias toward economic betterment.

This roadmap embraces a bias toward economic betterment, explicitly with a vision to create durable value for Pennsylvania's communities, workers, and institutions. That means both looking at long-term strategies and near-term actions that strengthen the state and local economies and affirm our position as a leader in both innovation and energy reliability. We see, as an example, particular promise in leveraging Pennsylvania's energy strengths and technological leadership to meet today's and the future's evolving compute power needs.

We are clear-eyed about guardrails and realism. The development of AI and the infrastructure that powers it is shaped by a web of global supply chains and shifting geopolitical currents that no single state can influence. This roadmap offers an informed structure to guide decision-making in Pennsylvania without pretending to have every answer. It must evolve with technology, markets, and stakeholder expertise and input. It is not perfect because no crystal ball exists. Our goal is to provide a shared foundation to organize around and refine together over time.



National and Pennsylvania Context

National Context: Where Energy, Data Centers, and AI Now Intersect

Understanding the national context is essential because the AI revolution is reshaping the technological and economic landscape at unprecedented speed. It is driving the current surge in infrastructure demand, massive data processing needs, and energy requirements. It is laying the long-term foundation for the future economy. Federal priorities, private capital, and rapid technology advancement are converging in ways that will define where value is created and who leads in the decades ahead. By seeing clearly how this fast-moving, high-stakes environment is unfolding, Pennsylvania can anchor its role in the next era of economic growth.

The AI Infrastructure Decade

The U.S. has entered an “AI infrastructure decade,” with federal policy and private capital moving together to build compute power at unprecedented scale. At the federal level today, [America’s AI Action Plan](#) puts compute infrastructure, connectivity, power, and talent on par with technology leadership itself, signaling fewer bottlenecks and faster permitting for AI-related build-outs across agencies and markets.^{1,2} That intent meets a historic wave of capital investment. Consultancies and banks now estimate trillion-dollar deployments into data centers through 2030, with persistent constraints around interconnection capacity, supply chain limitations, and skilled labor.^{3,4}

Increasing Energy Demand & Power Constraints

Power is the primary binding constraint. Grid planners in PJM and other regions continue to revise load forecasts upward as AI-ready campuses compress multi-hundred-MW requirements into short timelines. PJM’s 2025 forecast now includes new reporting for adjustments to peak electricity demand that are not a part of its usual models, and it points to big changes in the grid, lifting up specifically the growing impact of AI.^{5,6} Independent analyses suggest data-center electricity demand could increase 50% by 2027 and as much as 165% by 2030 globally, driven by AI training and inference. Hyperscale and colocation developers are experimenting with on-site and behind-the-meter generation to de-risk interconnection queues and speed time-to-power.^{4,7} Meanwhile, European and U.S. think tanks estimate AI workloads already account for a meaningful share of data-center consumption and could double that share by 2030, evidence that AI adoption is real, not cyclical.⁸ Energy readiness is the national bottleneck and therefore why Pennsylvania’s ability to provide scalable, dispatchable power with speed and reliability, and at low cost to consumers, will define its success in attracting AI and data center investment.

National and Global Dynamics	Pennsylvania Levers
NATIONAL AND GLOBAL POLICY SHIFTS <i>Federal legislation, international agreements</i>	PERMITTING AND REGULATORY PROCESSES <i>Streamlining approvals to accelerate projects</i>
GLOBAL ENERGY AND TECHNOLOGY MARKETS <i>Pricing, supply chains, trade policies</i>	CROSS-SECTOR COORDINATION <i>Aligning business, government, labor, and academia</i>
INFRASTRUCTURE SYSTEMS AT SCALE <i>Interstate transmission, broadband backbones</i>	TALENT STRATEGY <i>Aligning training programs with emerging industry needs</i>
GEOPOLITICAL DYNAMICS <i>International competition and security issues</i>	STATE-LEVEL INCENTIVES AND PROGRAMS <i>Shaping funding, tax credits, or pilot initiatives</i>

Urgency to Act: Seizing the Window of Opportunity

Given the rapid pace of change, the economic, community and societal impacts of energy demand, data center expansions, and AI are only beginning to become visible. For example, Brookings urges spreading AI's benefits beyond a handful of "superstar" metros, emphasizing readiness (talent, research, industry adoption) as the determinant of who captures value from the build-out. That logic increasingly applies to energy readiness as well: places able to marry compute readiness with reliable power and pragmatic siting will out-compete.⁹

The U.S. is rapidly accelerating in the AI race, but realizing its full potential will depend on expanding infrastructure through practical, community-driven partnerships among utilities, regulators, developers, and local leaders. For states and regions, the opportunity window is open now; the risk is letting permitting cycles and grid queues slip while capital redeploys to faster-moving peers.³

Pennsylvania Powering the Nation

By the Numbers

- 2nd** largest producer of natural gas
- 2nd** largest net supplier of energy to other states
- 2nd** in power from nuclear sources
- 3rd** largest power generator
- 3rd** largest coal-producing state

Pennsylvania in the Frame: Strengths to Win and Timing Matters

Pennsylvania sits at a powerful crossroads in the AI era, with strategic assets that align directly with what the next generation of AI-driven industries require. A deep bench of R1 research universities, and assets such as the Pittsburgh Supercomputing Center, anchor a pipeline of talent and R&D that few states can match. Pennsylvania's "all-of-the-above" energy strength, from abundant natural gas to nuclear, renewables, and robust grid infrastructure, positions the Commonwealth to deliver both reliable power and a credible low-carbon path forward.

Talent depth adds another dimension with considerable potential: a solid community college and technical school network, union partnerships, and training programs could be leveraged to equip Pennsylvanians for the specialized demands of high-density, advanced computing operations. Geographically, our central position in the PJM grid means we are well-placed to integrate regional transmission and meet the fast-growing energy needs of AI infrastructure without depending solely on distant generation sources.

Pockets of momentum are building. Regional initiatives are connecting universities, industry leaders, and government in ways that signal readiness and adaptability to national investors. Data center activity is expanding, with developers exploring conversions of legacy energy and manufacturing sites into AI-ready campuses. At the same time, PJM's evolving load forecasts now explicitly recognize AI as a structural driver of future demand, underscoring both the opportunity and the urgency for Pennsylvania to stake its claim.

Pennsylvania's opportunity is significant, but it is complex. Competing in the AI race will require navigating complex, locally driven land development and permitting, aligning diverse stakeholders, and making hard, time-sensitive decisions. In a transformation moving at AI speed, hesitation or fragmented action risks ceding advantage to faster-moving states. Balancing community interests, consumer costs, environmental stewardship, and long-term economic goals will demand disciplined, transparent choices, acting with urgency to strengthen the Commonwealth's competitiveness for the future.

- ¹ United States, Executive Office of the President. America's AI Action Plan. The White House, July 2025, <https://www.whitehouse.gov/wp-content/uploads/2025/07/Americas-AI-Action-Plan.pdf>
- ² "A New Era for U.S. AI Policy: How America's AI Action Plan Will Shape Industry and Government." Consumer Finance Monitor, 28 July 2025, <https://www.consumerfinancemonitor.com/2025/07/28/a-new-era-for-u-s-ai-policy-how-americas-ai-action-plan-will-shape-industry-and-government/>
- ³ Breaking Barriers to Data Center Growth. Boston Consulting Group, 2025, <https://www.bcg.com/publications/2025/breaking-barriers-data-center-growth>
- ⁴ AI to Drive 165% Increase in Data Center Power Demand by 2030. Goldman Sachs, 2025, <https://www.goldmansachs.com/insights/articles/ai-to-drive-165-increase-in-data-center-power-demand-by-2030>
- ⁵ PJM Interconnection. 2025 Load Report. PJM, 2025, <https://www.pjm.com/-/media/DotCom/library/reports-notice/load-forecast/2025-load-report.pdf>
- ⁶ PJM Interconnection. Load Forecasting Supplement and 2025 PJM Load Forecast Report. PJM, 2025, <https://pjm.my.site.com/publicknowledge/s/article/Load-Forecasting-Supplement-and-2025-PJM-Load-Forecast-Report>
- ⁷ "Data Centers Bypassing the Grid to Obtain the Power They Need." Data Center Knowledge, 2025, <https://www.datacenterknowledge.com/energy-power-supply/data-centers-bypassing-the-grid-to-obtain-the-power-they-need>
- ⁸ Buffard-Rochegonde, Philippe. Artificial Intelligence, Data Centers, and Energy: Understanding the Challenges. Institut Français des Relations Internationales (Ifri), Feb. 2025, https://www.ifri.org/sites/default/files/2025-02/ifri_buffard-rochegonde_ai_data_centers_energy_2025_2.pdf
- ⁹ Muro, Mark, and Sifan Liu. "Mapping the AI Economy: Which Regions Are Ready for the Next Technology Leap?" Brookings, 2025, <https://www.brookings.edu/articles/mapping-the-ai-economy-which-regions-are-ready-for-the-next-technology-leap/>

Important Dynamics and Considerations

While the roadmap lays out a clear path for Pennsylvania to strengthen its competitiveness in energy, data centers, and AI, there is also a set of complex and interconnected issues that can accelerate progress, slow it down, or reshape outcomes entirely. These are the “important dynamics and considerations.” For many stakeholders, these issues are the ones that most directly shape their decisions and priorities.

They include permitting reform, the role of PJM, financing structures, energy sources, talent gaps, community buy-in, manufacturing supply chains, water and land use, and the tax implications of large-scale infrastructure investment. Each of these topics could stand on its own as a major policy paper, and many are already the focus of work by organizations across Pennsylvania and nationally.

In the context of this roadmap, these dynamics and considerations act as critical dependencies to the core strategies and actions, elevating the complexity of the moment and opportunity. At times they may provide opportunities to accelerate progress; at other times they may present barriers that must be addressed before forward movement is possible.

What follows is a set of concise write-ups for each consideration. They are not exhaustive but serve to recognize the issues, reflect stakeholder input, and outline the implications for Pennsylvania’s ability to execute on the core roadmap. For readers who are most concerned with one of these areas, the details provide a clear entry point into how it connects to the larger strategy.

Consumer Protection

Data center development, along with expanded domestic industrial manufacturing and electrification of transportation and building HVAC markets, is increasing expected demand for power, with estimates from the North American Electric Reliability Corporation and the Federal Energy Regulatory Commission projecting demand growth rates not seen in fifty years. Large load users present both an opportunity to manage grid costs by increasing utilization of assets that otherwise are used only in times of higher demand, but may present a challenge and potentially increase costs if their operations push up peak demand, which is when the system is exponentially more costly. Well-designed approaches to encourage flexible operations of large loads, increasing the availability of firm power capacity, and assuring fair cost allocation for new infrastructure can reduce cost pressures on ratepayers and avoid erosion of social license for this industry.

Public utility regulators in Indiana and Georgia have reached settlements with data center operators and consumer advocates with the goal of protecting ratepayers from the costs of the infrastructure needed to serve the data centers. Grid operators in Texas, PJM, and other jurisdictions are advancing proposals to encourage more flexible operations of data centers to keep them off peak hours so as to improve overall system efficiency and minimize cost increases. The Pennsylvania Public Utility Commission also has a pending rulemaking to address these issues in regulated electric utility tariffs. Well-designed approaches to encourage flexible operations of large loads can reduce cost pressures on ratepayers and avoid erosion of social license for this industry.

Data Center Economic Impacts

Despite the recent surge in proposed data centers in Pennsylvania, broader economic impacts and tax implications particularly at a local level remain largely undefined. While property tax revenues may arise from land and buildings, the equipment housed within data centers is exempt from local property taxes, reducing the full potential fiscal impact for host communities. Still, for some communities, re-investment in older sites, or investment in new sites may provide a needed and sizable boost if the local industrial market is relatively stagnant. Sales and use tax effects at the state level are also uncertain, as are the total capital investments and employment numbers, which vary significantly by site. Rather than expecting each municipality to model these complex factors on their own, Pennsylvania would benefit from independent regional or statewide economic analyses that offer consistent, transparent projections. These analyses are especially important in the short term, as new projects continue to emerge and communities seek clarity on the true value of hosting this infrastructure.

Demand-Supply Alignment

Balancing energy supply with evolving demand from data centers and AI infrastructure is one of Pennsylvania's most pressing challenges. This roadmap emphasizes the need to avoid building infrastructure simply for the sake of building. Instead, new generation, transmission, and data center assets must be strategically aligned with demonstrated and growing demand.

Market forces already limit the potential for overbuilding, since excess energy can often be sold into PJM and data center operators are typically contractually obligated for infrastructure costs. In this sense, developers are already positioned to internalize much of the risk, and state policy should continue to ensure that large-scale users bear responsibility for the infrastructure they require.

The greater risk to Pennsylvania lies not in overcapacity but in ensuring the right amount of strategic investment. PJM is experiencing a widening gap between projected peak demand and available supply due to rising AI loads, electrification, and retirements of existing generation. Addressing this risk requires timely additions of new generation capacity, modernization of the grid, and more accurate and transparent load forecasting. Improvements may include a return to integrated resource planning, stronger state-level oversight, and collateral commitments from developers to minimize uncertainty.

To guide these efforts, Pennsylvania should prioritize modular data center design, encourage the repurposing of existing infrastructure, and create mechanisms for coordinated oversight. A statewide coordination office or ombudsman, with expertise on the rapidly evolving technology and efficiencies, could play a vital role in aligning capacity expansion with actual demand. By pursuing this approach, the commonwealth can ensure reliability, affordability, and competitiveness while seizing the opportunities created by AI and data center growth.

Infrastructure, Water, and Land Use

“Shovel-ready” means more than just available land. Competitive sites require reliable water and wastewater capacity, robust broadband and fiber connections, and firm, affordable power with clear interconnection options. Electricity and water remain immediate bottlenecks, while broadband and fiber expansion can extend benefits beyond a single project. Pennsylvania should map where water, power, and fiber converge and target upgrades that unlock multiple projects and broad benefits.

Data centers, in particular, demand large parcels of land and significant water for cooling, which can create conflicts with agriculture, residential development, and climate resilience. Careful siting and planning are essential to balance cooling technologies, hydrology, seasonal demand, and stormwater management, while coordinating permits across agencies. Brownfield and industrial sites can reduce conflicts and costs and pairing buildout with broadband extensions can close digital gaps in surrounding areas.

Parallel strategies such as substation upgrades, on-site or adjacent generation, and grid investments can ease long interconnection queues and transformer backlogs. Communities that host projects should see clear benefits, whether through infrastructure improvements, broadband access, or conservation set-asides. Impact fees or community benefit agreements can support water and wastewater upgrades, while transparent engagement with municipalities on resource sharing builds trust. Thoughtful planning across infrastructure, water, and land use will reduce opposition, accelerate approvals, and ensure growth that strengthens rather than strains communities.

Large Tech Companies Focused on Immediate-Term Gains

Hyperscale developers today are prioritizing speed and short-term siting needs to meet their own goals and targets. Pennsylvania must ensure that these immediate projects also contribute to long-term public value. Clear expectations should be set at the outset: developers seeking expedited approvals should also invest in local talent pipelines, infrastructure that benefits communities, and community benefit agreements. Risk-sharing strategies can make this work more attractive for investment and collaboration. For example, flexible demand programs allow energy-intensive users to shift usage during peak hours, reducing costs for both businesses and utilities. Public-private cost-sharing can accelerate needed grid updates. Similarly, creative pilots that capture and reuse heat from data centers can lower operating costs. These types of partnerships align private investment with public benefit, making growth more efficient and broadly supported. Pennsylvania should learn from states where hyperscaler concentration has led to grid strain and community opposition and incorporate lessons learned.

Local Land Planning/Local Dynamics

Local governments will determine where and how data centers and energy projects move forward in Pennsylvania. Many municipal zoning codes and comprehensive plans were not designed for facilities of this scale, which creates delays and uncertainty for investment. Pennsylvania can help communities that want to host these projects by providing model ordinances, zoning templates, and coordinated timelines that align state and local reviews. A state “no-wrong-door” function (a customer-service model that ensures communities and applicants can access the right contacts and resources across agencies, regardless of entry point) and a regulatory toolkit for local governments would simplify processes and reduce duplication. Communities need to understand trade-offs, benefits, and site realities such as land size, utility and other infrastructure demands. Accelerating brownfield or already-entitled sites may demonstrate benefits more quickly and clearly, and lower risk. Done well, local planning can become an accelerator, not a barrier, by aligning community priorities with statewide strategy and reducing the perception that projects are being imposed.

Manufacturing Supply Chain

Pennsylvania has a unique opportunity to capture more of the value chain that underpins advanced energy systems and data centers. Localizing production of critical components such as transformers, switchgear, specialized cables, cooling systems, and backup generation equipment both plays to Pennsylvania’s manufacturing strengths and drives broader economic impact. Western Pennsylvania already hosts firms like Mitsubishi, Hitachi, GE Vernova, and CorePower Magnetics, with strong capabilities in transformers and electrical equipment, offering a base to build upon. Addressing supply chain delays, particularly the national transformer backlog, should be an early focus, supported by procurement preferences, pooled purchasing, and in-state staging facilities.

Beyond hardware, Pennsylvania can lead by embedding artificial intelligence into manufacturing itself. More than 95 percent of the state’s manufacturers are small or mid-sized enterprises (SMEs), and many face barriers in adopting advanced technologies. Team Pennsylvania’s proposed AI Manufacturing Scaling Initiative aims to bridge this gap by connecting SMEs to the expertise and resources of tech companies investing in Pennsylvania data centers. Through partnerships, tools, and knowledge sharing, SMEs can adopt AI incrementally to improve efficiency, quality control, and supply chain resilience. This approach will help smaller firms grow into suppliers for data center infrastructure while enhancing their competitiveness in global markets.

Together, these efforts can strengthen Pennsylvania’s role as both a supplier and an innovator. By pairing targeted investments in manufacturing capacity with programs that accelerate AI adoption among SMEs, the commonwealth can expand local supply chains, reduce project delays, and generate multiplier effects that reach well beyond the data center industry.

Measuring Leadership in AI Commercialization

To lead in AI commercialization, Pennsylvania must pair strategic action with measurable results. Leadership will be defined both by the number of patents, licenses, and spinouts, and by how effectively ideas are moved from lab to market, scaled by businesses, and embedded in communities. To accelerate real-world impact, Pennsylvania must prioritize use-inspired research, that is, projects driven by practical problems and industry needs. Strengthening partnerships between businesses and higher education institutions will ensure that research is not only cutting-edge, but also immediately applicable, accelerating the cycle from discovery to deployment. Metrics should reflect the full commercialization lifecycle from early-stage innovation to product deployment, and include start-ups launched, jobs created, industry partnerships, investment attracted, and infrastructure leveraged.

Equally important is the ability to tell a story of broad-based growth. Pennsylvania's strength lies in the breadth of its ecosystem: world-class universities, a resilient manufacturing base, and growing public-private momentum. A strong commercialization scorecard should track outputs alongside ecosystem health, gauging how universities, talent systems, tech accelerators, and community partners are aligning to bring research to life. This balanced approach will help Pennsylvania demonstrate not just progress, but staying power, as it becomes a national hub for applied AI innovation.

Natural Gas

In the last two decades, natural gas has played a central role in Pennsylvania's energy economy, particularly due to the Marcellus and Utica Shale development. The rapid growth of production created significant export opportunities, but it remains an open question whether the commonwealth was able to maximize the downstream economic benefits brought on by shale gas. During that timeframe, large-scale in-state customers were limited to power generation as the market accelerated its shift from coal to natural gas. That landscape may now be shifting as data centers and other high-energy users emerge as potential demand drivers. As activity increases, the question facing us now is what type of coordinated approach can ensure that Pennsylvania fully leverages the broad-based economic development benefits that gas can lead to.

Looking forward, demand for natural gas is expected to increase nationally and internationally, with liquefied natural gas exports and expanded pipeline capacity likely to be important elements of this growth. Pennsylvania faces strategic decisions about the balance between new pipelines, additional transmission lines, or hybrid solutions that can meet both in-state and regional demand. Forthcoming grant opportunities could provide resources to advance these objectives, though success will require long-term planning since major initiatives such as the Regional Energy Transmission Infrastructure effort are measured in decades rather than years.

As demand for electricity increases, the need for additional baseload dispatchable power is anticipated to grow rapidly. For data centers, this type of reliable, on-demand generation remains a top priority in the near and mid-term, even as sustainable and renewable solutions continue to expand and mature. Storage is also becoming an increasingly viable option for backup power at data centers, including the large-scale deployment of new battery technologies. Compared with diesel or other higher-emitting backup generation, storage can reduce CO₂ emissions and, when paired with additional renewable capacity, can offer advantages in both cost and sustainability. Over the longer term, extended-duration storage may also be

achieved through green hydrogen production, which can provide greater energy capacity than current battery technology when sited in proximity to data center development.

Because of constraints on gas transmission out of Pennsylvania, there will likely be an ongoing price advantage to converting natural gas resources into power within the state. This dynamic can complement the growth of renewables by providing reliable baseload power and supporting a balanced, resilient energy mix. Additionally, because natural gas already provides a significant share of electricity generation in the commonwealth and could play a larger role as near- and mid-term demand grows, Pennsylvania should consider statewide initiatives to develop feasible, commercially viable pathways for carbon capture, utilization, and/or storage (CCUS).

Natural gas can also underpin broader economic development strategies. Data centers and industrial facilities that colocate with gas-fired power plants benefit from lower electricity costs, while their presence can attract investment in infrastructure such as broadband and fiber. These digital assets allow energy-intensive industries to connect and grow more efficiently, providing complementary benefits that extend beyond the fuel source itself. Natural gas can also serve as a lower-carbon alternative for hard-to-abate industrial sectors that may exist or co-locate in these same communities, supporting a transition to cleaner operations while maintaining reliability. Emerging fuel cell technologies, which generate power from natural gas without the same emissions associated with combustion, further illustrate the role natural gas can play in moving toward a lower-carbon future. Where feasible, Pennsylvania could also advance carbon utilization from captured CO₂ associated with new power generation, supporting industrial uses including the scaled production of common precursor chemicals and new carbon-based manufactured products.

Marcellus and Utica gas production and transmission are also among the lowest fugitive greenhouse gas emission-intensive basins in the United States and globally. Enhanced statewide initiatives to continue the push to lower methane emissions, aligned with certification of natural gas sourced in Pennsylvania that meets emissions targets, will be key to matching the sustainability goals of data center developers. Pennsylvania natural gas therefore offers an important bridge toward a lower-carbon future, particularly for heavy industry and other hard-to-abate sectors that could co-locate with new power and data infrastructure. Data center developers should also consider the upstream implications of natural gas and potential fugitive methane emissions through procurement choices such as sourcing lower-carbon concrete, including recycled lower-carbon ingredients such as fly ash from past power generation activities. Emerging fuel cell technologies that create power from natural gas without the same emissions profile as combustion may offer an additional pathway for energy security while maintaining reliability.

Behind-the-meter (BTM) gas-fired generation is another important and emerging component of this energy transition. With “speed to power” now a federal priority and many states working to add capacity on accelerated timelines, BTM systems are becoming central to how new capacity is deployed. Pennsylvania currently has nearly 6 megawatts of BTM gas generation, and the largest planned data center campuses are exploring this model. BTM capacity often connects to the grid while retaining the flexibility to provide supplementary power back to it. In some cases, data center operators are beginning to invest directly in upstream gas production

and infrastructure, including wells, pipelines, and compression, which reflects an evolving structure in the energy supply chain. In addition, BTM generation associated with new data center loads could be sited in locations where there is potential CCUS capacity, creating an opportunity to pair fast deployment with an emissions-reduction pathway.

To strengthen the regulatory foundation for long-term CO₂ storage, the Department of Environmental Protection has taken steps to pursue primacy for permitting Class VI CO₂ disposal wells in the commonwealth. To translate this regulatory structure into project readiness, Pennsylvania will also need a more robust assessment of its geologic storage capacity to ensure CO₂ can be stored safely and permanently underground.

Two sizable barriers continue to limit the pace of growth: long permitting timelines for new transmission pipelines and extended lead times for new gas turbines, especially the largest and most efficient models. Addressing these challenges will be essential to realizing the full value of Pennsylvania's natural gas resources.

A key question is how natural gas fits into Pennsylvania's long-term narrative. The past twenty years have seen the majority of Marcellus production exported out of state, with as much as 80 percent of molecules leaving the commonwealth. A different approach, ensuring that more gas stays in Pennsylvania to serve industrial parks and households, could create a more compelling story about natural gas as a foundation for economic growth. While cost competitiveness remains an important factor, the broader opportunity lies in positioning natural gas as one element of a diversified energy and economic development strategy, adding to the near-term energy demands of the commonwealth, supplementing expanding deployment of renewables, supported by infrastructure investment, and aligned with emerging industries such as data centers.

Nuclear as the Cornerstone of “All-of-the-Above” Energy Approach

Nuclear power stands out as one of Pennsylvania’s strongest assets for supporting the growth of data centers and AI-driven infrastructure. It offers clean, firm electricity that can run continuously regardless of weather, making it an essential complement to intermittent renewable sources. With the second-largest nuclear generation fleet in the nation, Pennsylvania already has the expertise, supply chain, and industrial base to build on this advantage.

Nuclear’s role is increasingly tied to the needs of hyperscale data centers. Operators such as Amazon, Google, and Microsoft are seeking carbon-free, reliable baseload power, and nuclear energy can meet that demand. Opportunities extend from large reactors and grid-connected facilities to emerging technologies such as small modular reactors (SMRs) and microreactors like Westinghouse’s eVinci™, which could provide scalable, on-site power for both large and medium-sized data centers. These modular technologies, once commercialized, would allow Pennsylvania to deploy nuclear solutions more flexibly and at lower cost than traditional large-scale plants.

Challenges remain. Nuclear projects require high upfront capital investment, long permitting timelines, and continued attention on safe waste management. Advanced reactors may not be commercially available until the 2030s, meaning they are unlikely to power the first wave of data center buildouts. However, over the long term, nuclear power can deliver durable economic benefits: stable electricity prices, well-paying jobs, and reduced land footprint compared to other clean energy options.

Crane Clean Energy Center



While the Three Mile Island Unit 2 closure remains a cautionary note, discussions about restarting Unit 1 or repurposing the site highlight Pennsylvania’s potential to repower legacy assets.

Talent and Supply Chain



Pennsylvania’s nuclear workforce, engineering programs, and supplier networks form a ready-made base to expand into advanced reactors and next-generation nuclear technology.



Local suppliers across fabrication, machining, instrumentation, and maintenance further anchor the nuclear supply chain.

Positioning nuclear power as a cornerstone of Pennsylvania’s “all-of-the-above” energy strategy will enhance energy security, promote resilience, and strengthen the state’s leadership in advanced manufacturing.

Pennsylvania’s Existing Nuclear Industry

Pennsylvania operates nine nuclear reactors at four plants, providing more than 30% of the state’s electricity

	BWX Technologies Mt. Vernon Manufactures nuclear components and fuels
	Constellation Energy Statewide Operates multiple nuclear plants statewide, with intent to restart TMI-1 as the Crane Clean Energy Center
	Curtiss-Wright Cheswick Supplies control rod drive mechanisms, pumps, and valves for nuclear reactors
	Framatome Cranberry Township Provides nuclear services and fuel technology
	Precision Custom Components, LLC York County Manufactures large pressure vessels and specialty equipment for the commercial nuclear industry
	Talen Energy Berwick Operates the Susquehanna nuclear station, producing clean energy for the regional grid
	Vistra Corp. Montgomery County Owns and operates Limerick nuclear power plant, supporting baseload power generation
	Westinghouse Electric Corporation Cranberry Township A global leader in nuclear design, SMRs, and advanced fuels

**Non-exhaustive*

Pennsylvania Tax Structure and Local/State Taxes Broadly

States across the nation are evaluating tax policy to influence where data centers and supporting industries choose to locate. Since 2022, Pennsylvania has offered a Computer Data Center Equipment Exemption Program, which exempts sales and use tax by certified data center owners, operators or tenants. Pennsylvania should evaluate additional tax tools tied to designated regional AI-activation corridors where performance-based abatements or credits could be available to projects generating verifiable community and statewide benefits. At a local level, revenue-sharing or revenue recycling approaches, such as impact fees or credits tied to performance, payment-in-lieu-of-taxes agreements or funding for local infrastructure, could fund notable economic development needs ranging from site preparation, utility upgrades, or training grants in host communities.

Permitting Complexities and Streamlining

Permitting is one of the most complex and critical steps in developing data centers or energy infrastructure in Pennsylvania. These projects often require a broad range of approvals from local, state, and federal entities, and the process can vary significantly by location, project type, and site conditions.

At a minimum, developers or project owners typically need land use and zoning approvals from local governments to ensure the site is suitable for industrial use. Building permits, demolition permits (for redevelopment sites), and stormwater or erosion control approvals may also be required. If the project involves energy generation, transmission, or heavy electrical load, additional permits from the Pennsylvania Public Utility Commission (PUC), Department of Environmental Protection (DEP), and possibly PJM come into play. These permits might include air quality, water discharge approvals, wetland or stream encroachment, and interconnection studies or agreements for tapping into the electric grid.

The complexity arises not only from the number of permits but from how they interact. Different agencies have different timelines, data requirements, and stakeholder review processes. Local ordinances can add layers of variance or conditional use hearings. For greenfield sites, infrastructure like roads, water, and sewer may need to be expanded, triggering additional review.

Because permitting touches so many systems such as land, energy, water, and environmental impacts, it is often cited as a top barrier to investment. Streamlining, sequencing, and coordinating these reviews is essential to keeping Pennsylvania competitive while ensuring that development is responsible and community-aligned.

PJM Dependencies

PJM remains one of Pennsylvania's most important assets, providing a large and well-regarded regional transmission organization that attracts investment to the commonwealth. At the same time, the pace of PJM's planning and interconnection processes does not always align with the urgency of data center and AI-related demand growth. Stakeholders widely recognize the need for more timely decisions and greater certainty for investors and utilities.

Pennsylvania should focus on using its position as a major energy exporter within PJM to advocate for reforms that improve planning and interconnection timelines. Recent updates to PJM's rules, including expedited review for shovel-ready projects, mark progress. Additional opportunities include commissioning joint studies with PJM, the U.S. Department of Energy, and the Pennsylvania Public Utility Commission (PUC) to identify priority transmission corridors and better align regional and state-level planning.

Utilities also have tools available, including the ability to pursue supplemental transmission projects outside PJM's formal process. While this approach can be complex, it highlights the flexibility already within the system. Transmission upgrades will be critical, and Pennsylvania should highlight the potential of strengthening existing infrastructure. Utilities such as PPL have shown leadership in this area, offering models that could be replicated more broadly. At the same time, data centers themselves can contribute to grid stability by offering flexible demand services or onsite generation, reducing pressure on the system.

By coupling strong advocacy within PJM with state-led planning, strategic transmission upgrades, and innovative partnerships with data centers, Pennsylvania can ensure that PJM continues to be a driver of reliability and competitiveness as the energy landscape evolves.

Lessons from Other States



Virginia leveraged its role in PJM to attract large-scale data center development, but slow interconnection timelines and grid strain have forced policymakers to revisit incentive and planning frameworks.

Illinois and New Jersey have pursued reforms that allow utilities to accelerate specific transmission projects outside of PJM's formal process, highlighting alternative ways to build to build critical infrastructure more quickly.



Maryland has increased coordination between its state energy office and PJM to better align state policy priorities with regional planning, ensuring that renewable and distributed resources integrate into the grid effectively.

Renewables and Other Energy Technologies

As Pennsylvania prepares for a dramatic rise in electricity demand from data centers and advanced manufacturing, renewable energy paired with long-duration energy storage (LDES) will be one essential component of the commonwealth's all-of-the-above strategy. For data center developers, speed and reliability remain the top priorities, meaning natural gas, which can deliver firm, dispatchable power quickly and at scale, will continue to serve as the most immediate baseload option while renewables and storage ramp up. Rather than being in competition, gas and renewables can progress in parallel, complementing each other to ensure both rapid deployment and long-term energy security.

Corporate developers continue to signal strong demand for clean, firm power, particularly solar, wind, geothermal, short-term batteries, and longer-duration energy storage, as part of their long-term site selection and sustainability strategies. Yet, while interest and investment are growing, deployment remains uneven. As an aspirational goal, Pennsylvania is looking to increase renewable energy to 35% of total generation by 2035, but achieving this goal will require new policy mechanisms, siting solutions, and permitting efficiencies.

Renewables currently supply approximately 4% of Pennsylvania's electricity, and several barriers must be addressed to scale their role. Permitting remains fragmented and locally driven, particularly for large solar and wind projects that often face local opposition. Many municipalities, represented by groups such as PSATS and CCAP, are cautious about centralized permitting authority and will only engage if tangible, localized benefits are demonstrated. Building social license for renewable projects will require a new emphasis on community-level value through infrastructure investments, tax benefits, and other visible local returns. Community concerns, particularly around land use and long-term local benefit, have slowed development in many rural areas. A more predictable, uniform permitting framework paired with clearer economic and infrastructure benefits for host communities will be critical to earning social license and accelerating buildout.

Examples from other states and regions underscore this need. The Hydro-Québec transmission corridor to New York City succeeded after the project sponsors worked directly with 35 local communities along the route, ensuring benefits and shared ownership were clearly defined. In contrast, projects such as the recent Berwick proposal in Pennsylvania have faced strong opposition in the absence of perceived local gain. Clear, community-centered benefit structures can transform potential friction into support.

At the same time, the technical limitations of today's renewables must be acknowledged. Solar and wind are variable resources, and while batteries and long-duration energy storage technologies are improving, they are not yet widely deployed at the scale or cost necessary to provide firm, 24/7 power. Other states, however, are seeing long-duration energy storage options that can solve for these short term, intermittent issues that Pennsylvania can look to for guidance. For the foreseeable future, renewables will require complementary generation plus LDES to ensure grid reliability, resilience, and system balance.

Other emerging technologies such as hydrogen, biofuels, fuel cells, and long-duration energy storage may play supporting roles, including for industrial use cases, process heat, and behind-the-meter generation. In particular, long-duration energy storage can enhance resource adequacy, solicit capacity payments, and offer ancillary services. However, these options remain early-stage and require continued investment, market development, and policy alignment to become commercially viable at scale.

To unlock Pennsylvania's renewable and firm power potential, corporate power buyers, including data centers and manufacturing partners, must continue to play a catalytic role by signing long-term power purchase agreements that help de-risk projects and attract financing. In parallel, state and regional partners and regulators must work to streamline permitting, strengthen transmission planning, and ensure that renewable development delivers tangible value for local communities.

Renewables and storage technologies are not a silver bullet, but neither are they secondary. With the right enabling conditions, they can serve as essential components of Pennsylvania's energy future to enhance diversity, meet corporate and system demand, and support broader economic and environmental goals in tandem with firm power solutions that can be deployed quickly and affordably.

Social License/Community Buy-In

Securing community support will be essential to Pennsylvania's long-term success in attracting data centers and aligning them with broader economic development goals. Community Benefit Agreements (CBAs) provide one pathway, but they must be designed carefully to balance consistency with local flexibility. Standardization can help establish baseline expectations, yet each community has unique needs that should be addressed through negotiation and dialogue.

Fundamental elements of effective CBAs include commitments to talent strategy, particularly creating pathways to the middle class through apprenticeships, training centers, and partnerships with community colleges or trade schools. Agreements should also address broader issues such as energy cost containment, local infrastructure improvements, and the use of new tax revenues to fund community priorities. Lessons from other sectors, such as Pennsylvania's landfill impact fee model, show that it is possible to combine a standardized framework with room for municipalities to negotiate additional or alternative benefits.

At the same time, CBAs should not be the only tool. Local governments will need to revisit comprehensive plans and zoning ordinances to determine where data centers fit within their long-term vision. Communication between municipal officials and developers will remain critical at every step. Community buy-in will depend on whether residents and businesses can see real, lasting benefits from having high-performance computing infrastructure in their region. Data centers on their own may not create many direct jobs, but they can serve as anchors for broader innovation ecosystems from powering advances in sectors like energy, agriculture, life sciences, and manufacturing to supporting research and enabling local startups. An opportunity lies in intentionally connecting what happens inside these facilities to the surrounding economy, even through indirect or downstream activity. By linking data center development to tangible local outcomes and creating clear but flexible frameworks for community benefit, Pennsylvania can strengthen trust, minimize opposition, and ensure projects deliver shared prosperity.

Resources for Community Benefit Agreements:

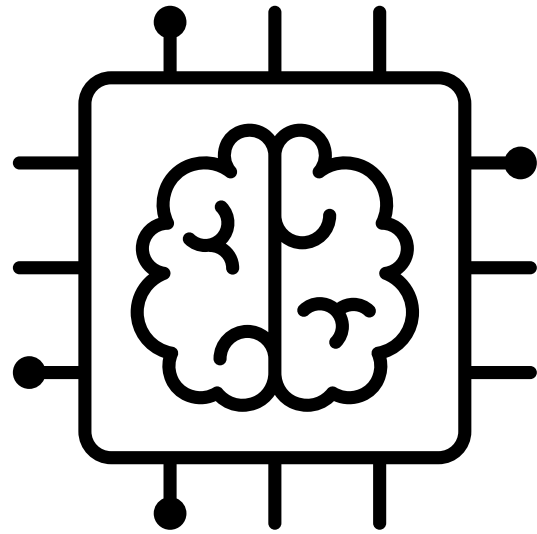
<https://www.wri.org/insights/community-benefits-agreements-us-clean-energy>

<https://climate.law.columbia.edu/content/community-benefits-agreements-database>

Workforce/Talent Pipeline Gaps

Pennsylvania's challenge is both skills and scale. The state must train more people for construction trades, high-voltage work, controls engineering, and data center operations, while also attracting specialists in AI and advanced computing. To date, both Google and Amazon have announced broad workforce development initiatives as part of their commitments to investment in the commonwealth, opportunities that should be fully maximized. Pennsylvania should consider a statewide talent council, regional readiness assessments, and shared metrics that track completions, placements, and wage growth. Expanded apprenticeships, micro-credentials, and co-ops should connect students to in-demand roles. Community colleges, universities, and unions can co-design training programs using existing facilities and labs.

Just as important, Pennsylvania must embed AI literacy and technical exposure across the entire talent pipeline, starting in K–12 and continuing through higher education and adult learning. Preparing for an AI-enabled economy is no longer optional. It is foundational to long-term workforce competitiveness.



Near-Term Actions (2025–2027)

To establish Pennsylvania’s early leadership in the energy-data-AI economy, near-term actions must remove immediate barriers, signal serious intent to investors and developers, and set the stage for longer-term transformation. These first steps emphasize readiness, coordination, alignment, and community engagement. As much as possible, AI should be fully deployed across these areas, not just as a support tool, but as a strategic driver, to amplify early actions and build sustained momentum.



Accelerate Permitting and Site Readiness

Speed to market is not a novel idea in economic development circles, but it is especially pressing today given the current and rapid deployment of capital to drive increased demand for AI-driven compute power. For Pennsylvania, this reality means even more aggressively streamlining permitting and building a meaningful inventory of sites spanning the readiness spectrum to ensure communities can meet energy-related development and the rising demand for AI. Projects under construction send the clearest signal of confidence to investors.

- **Generate an inventory of redevelopment/reinvestment sites** across Pennsylvania suitable for data centers, including sites on publicly owned lands with assessments of infrastructure elements, environmental remediation, and other land development requirements, leveraging the Commonwealth’s acceleration of site readiness, the PA Sites program, the existing inventory at [PA Site Search](#), and the expertise and knowledge of local economic development practitioners—attention should be given to a range of data center operation types, to include options suitable for smaller, in-fill sites and/or rural landscapes

- **Elevate appropriate “No-Bottleneck Sites”** across regions with zoning already in place for data centers, local approvals secured, and clear interconnection options to accelerate near-term construction. Include detailed energy attributes and new energy technologies such as geothermal, fuel cells, carbon capture, and behind-the-meter generation to guide companies with sustainability goals, clear interconnection contacts, comparative graphics that benchmark Pennsylvania’s energy strengths, and real-time updates on private-sector energy investments
- **Accelerate the permitting modernization strategy** by bundling approvals for energy, broadband, water, and zoning, modeled on successful frameworks in other states, expanding funding and resources for the Pennsylvania Office of Transformation & Opportunity ([PA FastTrack](#)), which conducts inter-agency coordination and transparency for project sponsors and the public alike, and using AI to streamline the process
- **Establish regional permitting commissions** to harmonize requirements across jurisdictions, supporting local municipal officials with effective technical assistance, providing access to expertise and resources to help guide their communities, and facilitating the delivery of permits



Incentivize Strategic Energy and Industrial Co-Location

Co-location of data centers, advanced manufacturing, and energy generation optimizes land use and infrastructure investments. This strategy allows Pennsylvania to attract next-generation industries while maintaining reliability and sustainability. In the near-term, crucial steps are required to assess the feasibility of this complex approach.



Pennsylvania’s natural advantages include:

- **Second largest proven shale gas basin** and gas producer in the nation
- **Price-advantaged** due to export/transmission constraints
- **Abundant water resources**, with more stream miles than any state except Alaska

- **Commission a study with PJM, DOE, and/or PUC** to identify where a transmission corridor could or should be built, including opportunities for upgrading existing transmission lines
- **Launch AI Infrastructure Opportunity Zones** in regions with aligned assets (e.g., sites zoned appropriately for data centers, with adequate power, water, broadband, and innovation anchors such as academic research institutions) to test integrated siting strategies that adapt to the anticipated evolution of data centers and offer targeted incentive packages that primarily focus on speed to market. Such a strategy recognizes certain parts of the state have the assets necessary to be poised for long-term growth and maximum spillover effects to industries in the supply chain and in industries using AI
- **Coordinate state and federal funding streams** to close energy infrastructure gaps that hinder data center deployment and industrial growth on top opportunity sites, ensuring projects create benefits for both industry and local communities



Scale AI in Manufacturing

Pennsylvania's manufacturing sector is central to competitiveness, but most small and mid-sized firms (SMEs) face barriers to adopting advanced technologies. AI offers an incremental, cost-effective path to productivity gains, yet many SMEs lack capacity to evaluate and deploy solutions. The initiative will strengthen supply chains, boost SME competitiveness, and extend benefits to communities across the Commonwealth.

Team Pennsylvania will launch the AI Manufacturing Scaling Initiative to accelerate adoption and ensure SMEs are not left behind. The initiative will:

- **Build strategic partnerships with technology firms and regional subject expert "guides"** to expand access to AI expertise and resources
- **Support the development and circulation of tools and templates** to reduce friction and address implementation barriers facing SMEs
- **Amplify knowledge sharing through network events and peer learning** to elevate insights from early AI adopters and benefit the broader manufacturing community



Create A Collaborative Environment Encouraging Shared Resources

Collaboration across business, academia, government, and communities is essential for Pennsylvania to keep pace with rapid technological change. Creating spaces for shared problem-solving will align infrastructure, investment, and innovation, ensuring accountability and accelerating execution.

- Accelerate academic-led research and development by pooling resources across Pennsylvania's top-tier research institutions, building compute capacity, and focusing on applied AI and energy applications that directly advance Pennsylvania's economy
- Establish a centralized AI-Energy-Data Center Ombudsman/Coordination Office to work in public-private partnership with government, utilities, communities, developers, and end-users to serve as a clearinghouse for information, sharing data and insights across organizations and agencies, and a project tracking center
- Expand information sharing statewide and regionally through existing networks such as PSATS, CCAP, PML, Pennsylvania Economic Development Association, PA Chamber and Team Pennsylvania's cross sector collaboratives, ensuring ongoing visibility into AI developments and opportunities for community stakeholders to stay informed and engaged.



Expand Shared Knowledge Base Between State and Local Entities

Local governments are on the front lines of data center development and energy deployment. Providing tools and data that reflect evolving industry needs is both efficient and levels the playing field across Pennsylvania's diverse geographic landscape. A strong, shared knowledge base ensures that growth is fair and future-ready.

- Conduct economic modeling on AI Impacts, data center development, and energy implications, using current projects as case studies, assessing grid modernization effects, and tracking Pennsylvania's supply chain opportunities
- Partner with Pennsylvania State Association of Township Supervisors, County Commissioners Association of Pennsylvania and the Pennsylvania Municipal League to create model Community Benefit Agreements (CBAs), deliver outreach and training to local officials, and equip municipalities with tools to evaluate, plan for, and communicate the value of data-driven economic development
- Evaluate policy to modernize land use and permitting policy to better align local planning with high-growth industries and AI infrastructure needs, support municipalities with model zoning templates and technical assistance hubs, helping local officials update comprehensive plans and permitting codes to accommodate new industries
- Deploy immersive demonstration tools to help communities visualize the impacts of AI and energy infrastructure, making benefits and trade-offs more concrete for stakeholders



Strengthen Talent Strategy

Pennsylvania's talent is both a constraint and a competitive advantage in the race to attract AI and energy investment. To meet growing demand, training pipelines must expand, AI awareness must grow across the education and talent readiness system, and talent development must align tightly with industry needs. This effort must include reaching people of all ages, income levels, and geographies across the state, including those with little or no current exposure to AI or AI-related education so that every community has a pathway to participate in and benefit from this technological transformation. Talent readiness should be factored into site selection and community benefit strategies to ensure projects can scale and succeed.

- Conduct statewide talent demand assessments for construction, operations, and management roles across AI, data, and energy sectors, and publish results to guide investment decisions
- Develop rapid-deployment training cohorts with workforce development boards, labor, and academia to ensure skilled labor is available and mobile, recognizing that many workers will rotate between regional builds
- Prioritize career-connected learning and pre-apprenticeships near infrastructure corridors and pilot regions, creating visible entry points to middle-class careers in technology and energy
- Deploy an AI literacy program statewide through libraries, K-12 schools, community colleges, and other partners, demystifying AI while exposing Pennsylvanians of all ages, across all income levels and geographies, to practical AI applications and career opportunities

Top Occupations in Demand for Pennsylvania Data Center & Energy Projects



Electricians and High-Voltage Technicians

critical for interconnection, substation work, and facility operations



HVAC and Cooling Specialists

to design, install, and maintain energy-efficient cooling systems for large campuses



Construction Trades – (welders, carpenters, heavy equipment operators) – for site preparation, structural buildout, and utility connections

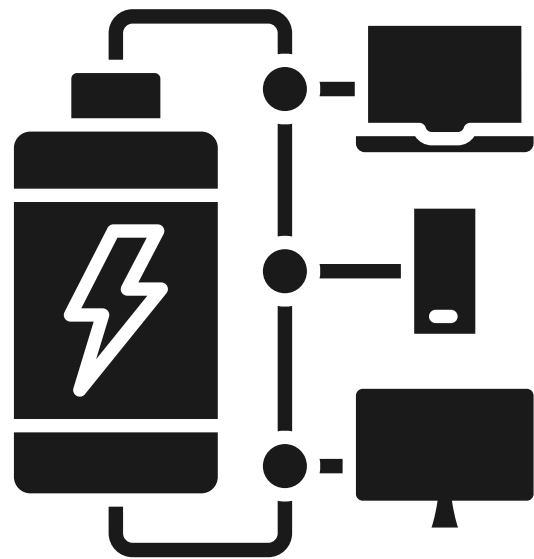


Data Center Operators and Controls Engineers

– to run facilities, ensure reliability, and manage advanced automation systems



AI and Cybersecurity Engineers – to support applied AI use cases, protect critical infrastructure, and integrate advanced compute resources



Long-Term Strategies (2025–2035)

Three mutually reinforcing priorities anchor Pennsylvania’s long-term strategies to 2035: Scale Commercialization and Technology Leadership, Modernize Energy Systems for Compute Resilience, and Build and Sustain Talent Pipelines. Together, these priorities chart a path for the Commonwealth to become a national leader in AI-driven energy transformation and a global hub for technology leadership.

What makes this moment unique in Pennsylvania is the convergence of unprecedented funding, an influx of people and institutions eager to engage, and broad alignment among leaders who want to make this work. Pennsylvania has the chance to capitalize on this spotlight through pilots that connect R&D with industry, demonstrating how complex real-world challenges in energy, infrastructure, and AI can be solved in ways that translate to other applications.

At the same time, delays in permitting, grid interconnections, or talent readiness could redirect investment to faster-moving peers. This realization makes coordinated near-term action essential. Pennsylvania’s strengths, including world-class research universities, a strong manufacturing base, and its position as a net exporter of energy, ground these strategies. They align these assets toward a technology-anchored economy. This roadmap outlines the goals, enablers, and coordinated actions required across regions, sectors, and institutions to ensure the benefits of this transformation reach communities statewide.



Scale Commercialization and Technology Leadership

Pennsylvania has long been a leader in research and development, with seven R1 research universities and a track record of innovation in fields like artificial intelligence, advanced manufacturing, and energy. Yet the state has historically struggled to commercialize research at the same rate as peer states, leaving value on the table as ideas too often remain in labs rather than reaching markets. **To close this gap, Pennsylvania must pursue responsible commercialization, ensuring incentives are tied to long-term commitments such as community benefits, sustained operations, and investment in new generation capacity.** This challenge is not new, but the uniqueness of the current moment makes it more important than ever to solve. There is a surge of attention, resources, and commitment from individuals and organizations across sectors that are determined to bridge this gap. The convergence of federal priorities, private capital, and strong institutional assets means Pennsylvania has a window to finally accelerate commercialization at scale.

By 2035, Pennsylvania will be recognized globally for leadership in artificial intelligence and nationally for transforming the energy sector through AI. The state's seven R1 research universities, including AI-pioneer Carnegie Mellon University, bolstered with expertise from the Pittsburgh Supercomputing Center, one of only four in the nation, will serve as powerful engines for translating cutting-edge research into market-ready solutions. Pennsylvania's long-standing manufacturing base will provide the practical know-how, supply chain depth, and production capacity to move innovations from lab to large-scale deployment.

To make this shift, Pennsylvania will position itself as a national hub for AI commercialization by strengthening IP-to-market programs, expanding tech transfer capacity, and supporting startups through targeted incentives, seed capital, and industry partnerships. Structured commercialization programs will require clear market pathways for funded research, competitive grants that reward industry–university partnerships, and investment tools that recycle returns from successful ventures into new innovations.

AI and automation pilot testbeds in energy, defense, logistics, and manufacturing will be launched through public–private partnerships to validate new technologies, attract private capital, and shorten time to market. Regional AI Activation Corridors will anchor this work, integrating broadband, co-located firm energy from an all-of-the-above generation strategy, and talent pipelines, supported by coordinated permitting and infrastructure planning. Incentives will be structured to avoid a race to the bottom, ensuring data centers and commercialization projects deliver lasting value rather than short-term wins.

Through structured collaboration with PJM and neighboring states, Pennsylvania will export homegrown technology and share firm energy capacity, ensuring that commercialization success is matched by the ability to scale. **This combination of targeted programs, regional hubs, and cross-border coordination will create a thriving commercialization ecosystem where breakthroughs in energy technology, data infrastructure, and AI are conceived, developed, tested, and built in Pennsylvania to be exported to the nation and the world.**



Modernize Energy Systems for Compute Resilience

Pennsylvania has long been an energy powerhouse, serving as a net exporter of electricity and a leader in coal, natural gas, and nuclear energy generation. That history has made energy a cornerstone of the state's economy and a source of competitive advantage. Yet the demands of the AI era, with rapid growth in data centers, advanced manufacturing, and other high-load industries, present a new test of leadership. The costs of rapid load growth and infrastructure upgrades could fall disproportionately on consumers if not carefully managed, making fairness and affordability central to this strategy.

The scale and speed of expected demand means **Pennsylvania must not only continue as an energy exporter but also lead in building a modernized energy system that can deliver resilience, reliability, and adaptability.** At the same time, the opportunity is not only to avoid higher costs for customers but also to ride the wave of AI-driven economic growth. If Pennsylvania leans into its energy legacy and strengths, the state can position itself to capture decades of regional development, job creation, and long-term competitiveness. The risk of inaction is that costs rise and opportunities flow elsewhere; the benefit of bold action is that Pennsylvania builds a modernized energy system that supports both affordability and growth.

The moment is now to invest in comprehensive energy transformation. This investment means upgrading grid infrastructure, modernizing transmission and distribution systems, and streamlining permitting processes to accelerate new projects. It also means deploying scalable generation through an all-of-the-above energy approach that leans into best available technologies (e.g., including natural gas with carbon capture and storage, small modular reactors, grid-scale storage). **Priority should be placed on reliable and flexible power sources that can balance variable demand and ensure sufficient capacity to serve large-scale loads.**

Artificial intelligence will be integrated into grid management and operations to provide real-time forecasting, predictive maintenance, and advanced infrastructure modeling. **These AI tools will help optimize energy distribution, accelerate project deployment, and strengthen asset resilience.** Monitoring compute efficiency trends will ensure that infrastructure investments align with actual demand, avoiding costly overbuild. Resilience planning will account for rapid changes in technology such as advances in chip design, quantum computing, and AI algorithm efficiency that could shift energy requirements.

Three to five Regional AI Activation corridors will anchor around infrastructure that can maximize access to water, available land, and existing infrastructure such as brownfield industrial sites or vacated educational campuses. These regions will integrate energy, water, and broadband to ensure benefits are shared between rural and urban communities.

Pennsylvania will also deepen coordination with PJM and regional utilities to reform interconnection processes, shorten timelines for new energy projects, and create a transparent framework for high-load interconnections. By pairing AI-driven grid optimization with targeted siting strategies and co-locating generation, storage, and data infrastructure, Pennsylvania can distinguish itself from neighboring states. Given Pennsylvania's status as a deregulated utility state that separates generation from transmission and distribution, where generation is financed at developer risk, creative approaches such

as conditional incentives, grants, or low-cost financing will be necessary to compete with vertically integrated states that can build more easily and rate-base new capacity. Pennsylvania will also work with PJM and utilities to standardize data center forecasting and demand reporting to avoid overbuilding or double-counting across state lines.

Through this coordinated approach, Pennsylvania will not only sustain its role as an energy exporter but will also create a modernized energy system that powers AI-era growth. By reframing energy as both a resilience challenge and an engine of economic development, the state can ensure affordability for customers, capture new investment, and strengthen its long-term leadership.



Build and Sustain Talent Pipelines

Pennsylvania’s ability to lead in modern energy systems, data infrastructure, and AI commercialization will depend on the depth and breadth of its talent base. Yet the state faces a pressing challenge: population decline, an aging workforce, and a younger generation with limited exposure to emerging careers in energy, data, and AI. Without decisive action, Pennsylvania risks falling behind in filling critical roles just as new industries are scaling. Utilities must prepare for a wave of retirements, while the trades must expand training capacity quickly. Younger workers are seeking different career pathways but often lack clear entry points into technology-driven fields.

At the same time, Pennsylvania’s strong manufacturing heritage, combined with a high concentration of universities and research institutions, creates a unique foundation for a world-class talent strategy. The roadmap will leverage these assets to treat talent as a primary competitive advantage, ensuring that career opportunities are broadly accessible and equitably distributed. A coordinated statewide public education effort will help residents understand the role of AI and data centers, ensuring communities see benefits in addition to disruption.

The roadmap will address talent strategies across energy, data centers, AI, manufacturing, and construction trades, while ensuring that opportunities are broadly distributed rather than concentrated among the same pool of workers. These strategies include developing workforce frameworks, the blueprints that connect education and training to job readiness and long-term career growth in a targeted sector, and apprenticeships. These frameworks will be developed in the energy and data center sectors, expanding early-exposure career and technical education pathways and dual enrollment options. They will prioritize rural and distressed communities for targeted job training and mobility support linked to data center siting and AI deployment. Future talent strategies should also set clear disadvantaged community engagement targets, ensuring projects contribute to equitable growth, similar to models in New York’s renewable industry. Mechanisms to project labor demand will be created so training providers can scale with confidence, avoiding undertraining or overtraining.

A coordinated approach will focus on reskilling current workers, attracting in-migration from other states, and retaining graduates from Pennsylvania’s universities and technical schools. Decisive actions will include conducting talent demand studies, assessing current pipelines, and developing a talent readiness index to track progress. Partnerships will be critical and will include universities, vocational and technical schools with sufficient training capacity, trades, unions, and industry groups. The state will also strengthen its innovation ecosystem to connect training programs directly to high-value projects and employers.

By 2035, measurable outcomes will include the number of trained workers in energy-related and AI fields, the percentage of positions filled by Pennsylvania residents, and population growth in targeted skill areas. Addressing challenges such as population decline, skills gaps, and competition from other states will require coordinated action and sustained investment, but the convergence of energy, data, and AI growth provides Pennsylvania with a unique chance to build a resilient talent strategy that secures its competitive edge for decades to come.

Roles and Enablers

This roadmap’s success depends on coordinated action across diverse actors including the public, private, academic, and community-based sectors because energy, data center, and AI development intersect with everything from land use and permitting to talent pipelines and evolving technology. The categories below represent fundamental enablers of progress, each focused on a critical area where sustained attention and strategic alignment are needed. For each enabler, the types of organizations best positioned to lead or support are identified, recognizing that responsibilities are often shared across systems.



What: Policy, Governance, and Legal Reform

Who: Federal, State, and Local Government, Courts, Advocacy Groups

- Reform land development and energy permitting rules to reduce project delays, ensure transparency and align interest with long-term economic goals
- Coordinate AI ethics guidance to align with national standards
- Establish state-level Energy-Data Center-AI Coordination office to ensure alignment between these major influences
- Employ funds, policy, regulations, etc., to incentivize strategic outcomes



What: Infrastructure Planning

Who: Utilities, Water & Sewer Authorities, PJM, Public Sector, and River Basin Commissions

- Modernize grid infrastructure and accelerate transmission build-out to align with energy transition and AI-driven demand growth
- Update capital investment and asset management plans to adapt to future needs
- Publish key datasets to help educate communities and to support transparency
- Pilot innovative projects (e.g., renewable integration and data center heat reuse) to demonstrate Pennsylvania’s leadership
- Update zoning, siting and interconnection processes to support modular, low-carbon data center development across Pennsylvania’s diverse regions



What: Technology and AI-Driven Innovation

Who: Private Sector, Federal Labs, Academia

- Accelerate Pennsylvania-based R&D in energy innovation (e.g., cooling technologies, AI-enhanced grid efficiency) to strengthen the state’s leadership position
- Leverage higher education campuses as demonstration sites to showcase new energy technologies and innovation
- Promote edge computing, modular data centers, and high-efficiency compute designs to meet academic and industry needs in specific regions
- Support experimental deployment of clean and hybrid energy systems to test scalable solutions for future demand



What: Regional Impacts Across Rural, Urban, and Suburban Landscapes

Who: Local/Regional Planning, Zoning, Economic Development, Community Members, Public Sector

- Identify best practices and provide shared guidance to balance data center requirements with community impacts and benefits
- Share model ordinances, economic impact analyses, community benefit agreements to streamline adoption and implementation across Pennsylvania
- Advance local knowledge and planning to respond to emerging land use trends and AI-related infrastructure needs
- Establish clear pathways for existing industrial sites and brownfield redevelopment to reduce siting conflicts and leverage pre-permitting where appropriate
- Provide and track consistent data and analytics to improve transparency and local decision-making



What: Workforce

Who: Education, Workforce Development Boards, Private Sector, Trades

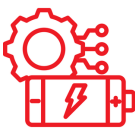
- Fund new pre-apprenticeship, apprenticeship, and credential programs to respond to real employer demand in energy, data, and AI sectors
- Leverage educational and training best practices from other states experiencing high data center development to assess short- and long-term talent needs
- Establish regionally tailored training hubs to align with the growth of infrastructure corridors
- Integrate AI, energy systems, and data infrastructure opportunities into existing career, technical, and/or dual-enrollment education programs to prepare the next generation of workers
- Upskill current energy, IT and manufacturing workers to expand Pennsylvania's talent pool for data center projects, grid enhancements and AI more broadly

Data Centers and AI in Action: Real Benefits for Pennsylvanians

Artificial intelligence and the data centers that power it are not abstract concepts; they already shape daily life in Pennsylvania and across the globe. Data centers provide the digital infrastructure that supports commerce, healthcare, education, and public services. AI applications layered on top of that infrastructure are transforming industries, creating efficiencies, and opening new opportunities for growth.



Everyday Life: AI powers digital assistants, fraud detection in financial services, targeted advertising, and even traffic management systems. These applications run in data centers that ensure reliability and secure access to information.



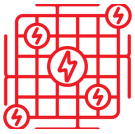
Manufacturing and Logistics: AI-enabled robotics, quality control systems, and predictive maintenance improve productivity on factory floors. Logistics companies use AI to optimize routes and reduce costs. Data centers provide the compute power for real-time decision-making that keeps supply chains moving.



Agriculture: Farmers are utilizing AI-powered tools to optimize planting schedules, monitor soil and crop health in real time, and manage livestock more effectively. These systems depend on data centers to process satellite imagery, sensor data, and predictive models, helping Pennsylvania's agricultural sector increase yields, decrease inputs, and adapt to changing climate conditions.



Healthcare and Life Sciences: AI is accelerating drug discovery, improving diagnostic accuracy, and enabling precision medicine. Hospitals already use AI tools for imaging analysis and predictive care models. These advances rely on secure, high-performance data centers that can store and process massive volumes of clinical data.

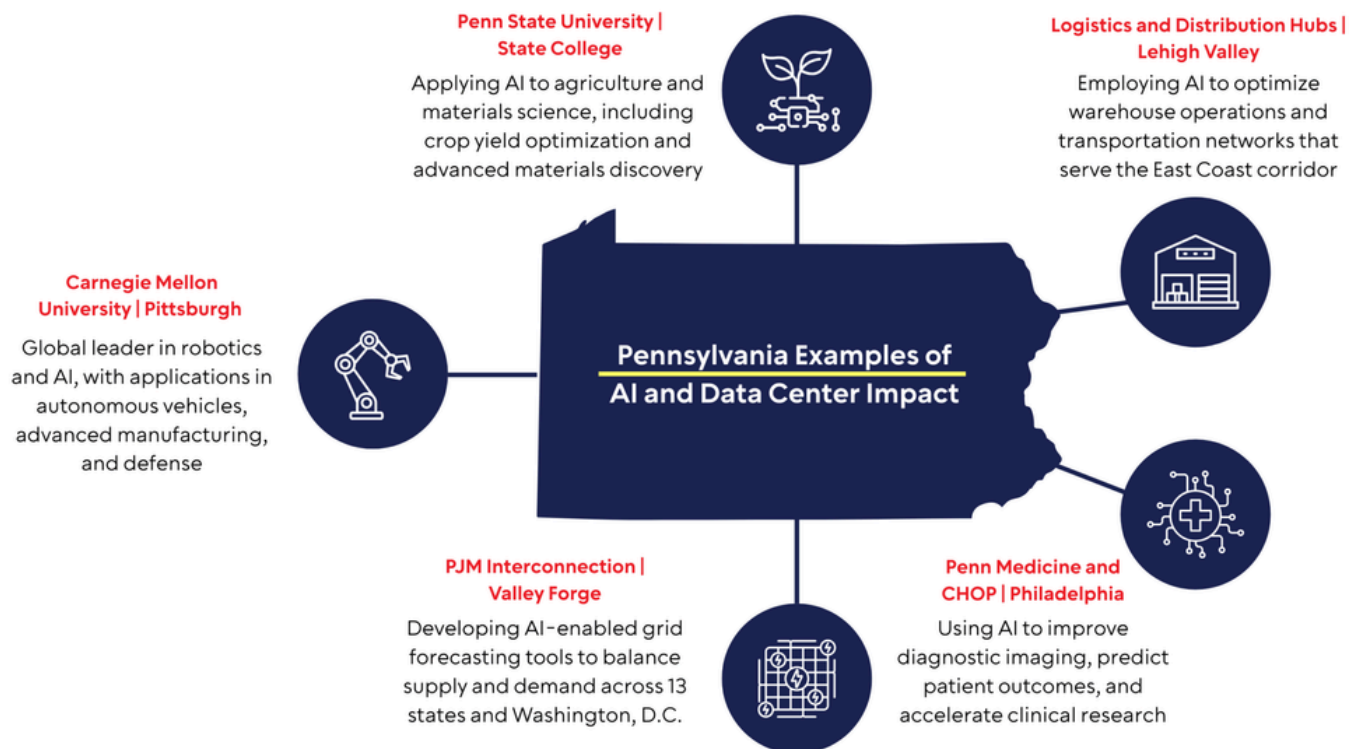


Energy Systems: Utilities use AI to forecast demand, integrate renewables, and manage grid stability. Data centers support these capabilities while also becoming energy customers themselves, incentivizing investment in firm power generation.



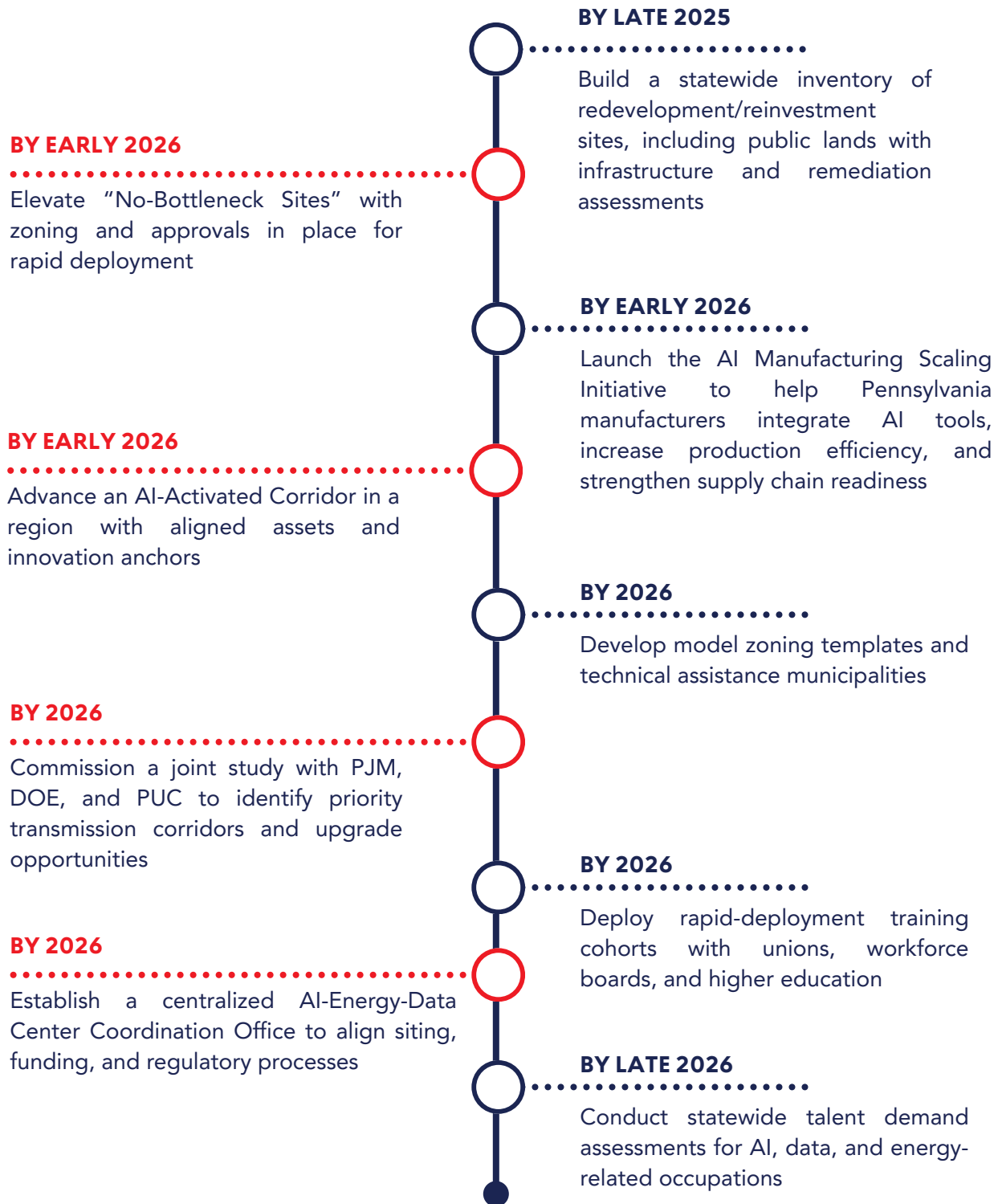
Education and Research: Universities use AI for everything from modeling climate change to advancing agricultural science. Shared high-performance computing housed in data centers gives Pennsylvania researchers a competitive edge and attracts talent to the state.

By investing in data centers and AI readiness, Pennsylvania is not just preparing for a future economy; it is strengthening the infrastructure that supports health, jobs, education, and daily life today.



Roadmap Timeline with Milestones

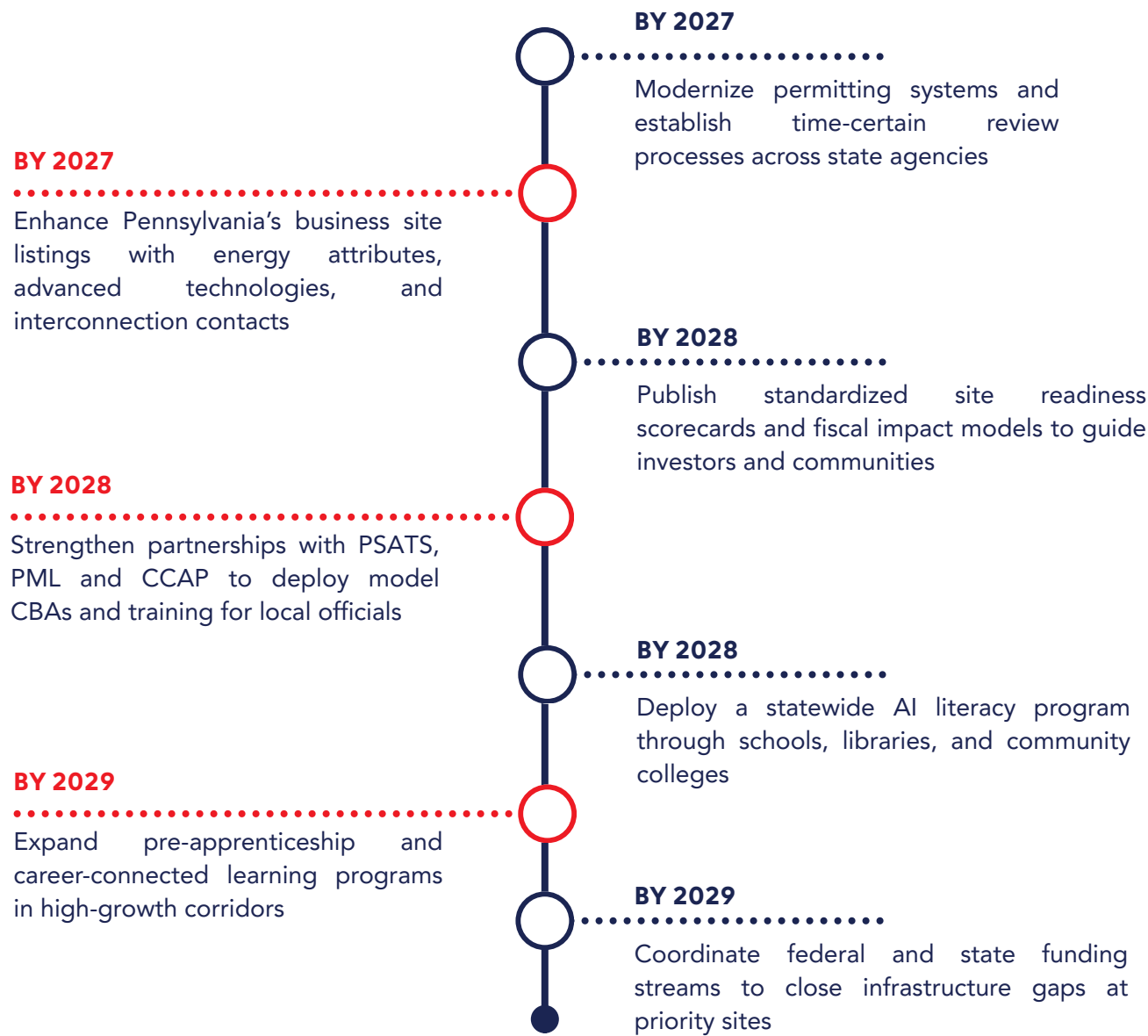
Immediate Actions (2025–2026)



Phased Roadmap Timeline with Milestones

Mid-Term Actions (2027–2029)

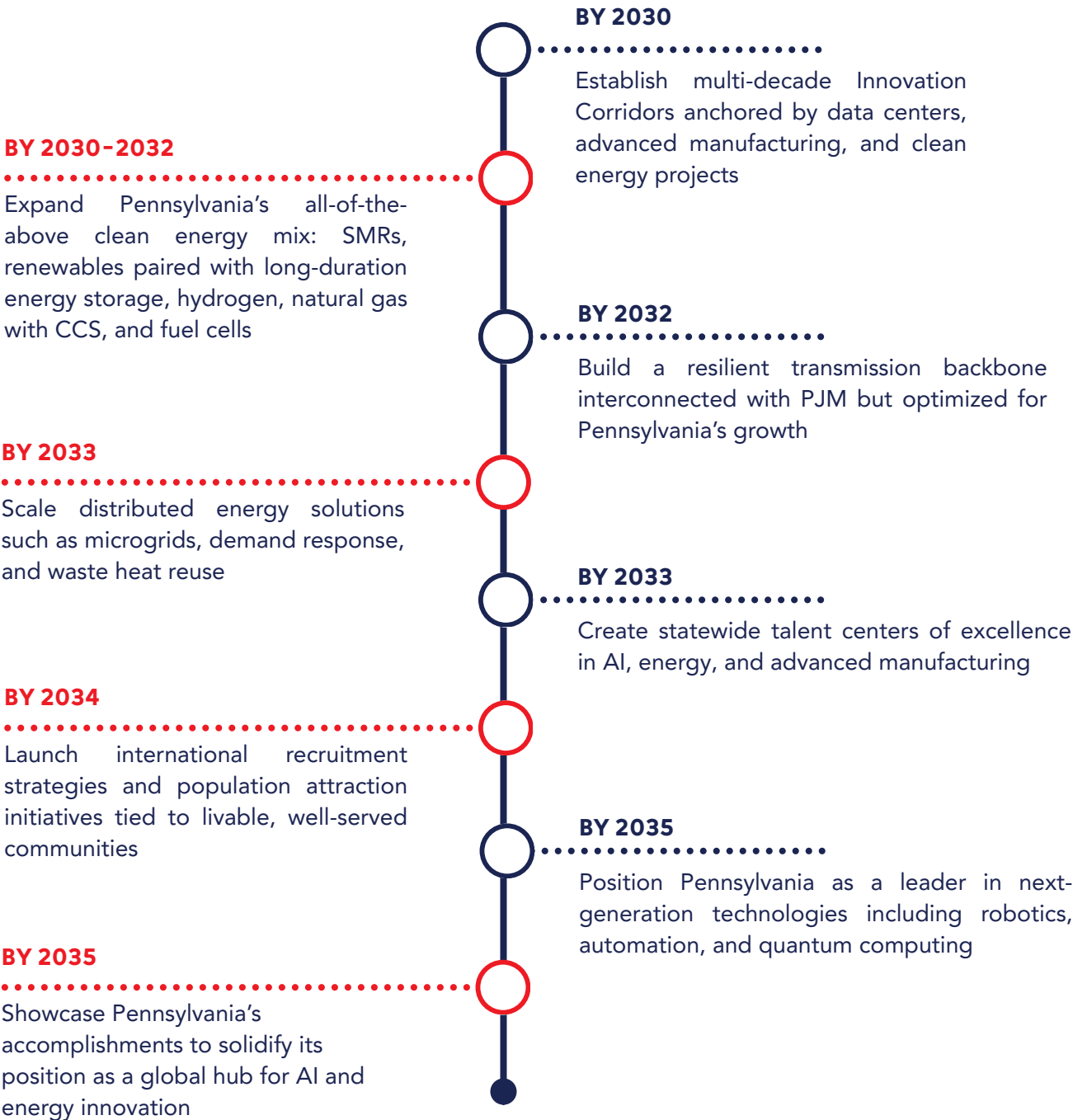
Scale pilot successes, expand co-location, and deepen community and local engagement.



Phased Roadmap Timeline with Milestones

Long-Term Actions (2030–2035)

Build sustainable ecosystems, modernize energy systems, and secure global leadership.



Team Pennsylvania Foundation Commitments

Team Pennsylvania's commitment to this roadmap is rooted in our belief that leaders must work together to address the challenges and seize the opportunities that no single sector or entity can navigate alone. Our role is to put the roadmap into action by convening the partners best positioned to activate the work, making strategic connections, aligning resources, and identifying fundable solutions that drive long-term economic growth across the Commonwealth. While many organizations are critical to implementing the roadmap, from government agencies to technology providers, Team Pennsylvania's unique role is to address coordination challenges that no single entity can tackle alone. Rather than trying to lead in all areas, we will focus on catalyzing action where shared effort is needed and filling systemic gaps in communication, alignment, and strategic investment.

What's Next?

Activate Key Initiatives

Team Pennsylvania will prioritize actions that align with our role as a convener, connector, and catalyst for shared progress. Most immediately, we are:

- Advancing an AI scaling initiative for small and medium sized manufacturers
- Conducting a statewide AI/Robotics value chain analysis
- Launching a nuclear initiative geared toward harnessing the full potential of advanced nuclear energy technologies and powering data centers

We will encourage partners to pilot community engagement frameworks, including model zoning templates and community benefit agreements, ensuring growth that benefits host communities. While Pennsylvania's all-of-the above energy approach will be shaped by industry and government, Team Pennsylvania will play an active role in amplifying these efforts, connecting stakeholders, and elevating opportunities where our collaborative model adds value.

Engage More Partners

Ensuring that Team Pennsylvania has a broad network of partners will be critical in delivering on the actions and strategies laid out in the roadmap, both to create additional capacity and to tap into the expertise and unique roles that other organizations play, from working directly with communities to creating policy to advancing new technologies. With this roadmap as a platform to connect with more

organizations and stakeholders, we will focus on deepening partnerships with state-level organizations such as PSATS, PML, CCAP and the PA Chamber as well as expanding our Cross-Sector Collaboratives in energy, manufacturing, agriculture, and robotics & tech. More than just connecting people, Team Pennsylvania will also help steer federal, state, and industry efforts to maximize access to funding opportunities that ensure that Pennsylvania projects are positioned for success.

Listen, Learn, and Adapt

The roadmap is not a static product but a living framework. Team Pennsylvania will continue to collect feedback through surveys, discussions, and targeted outreach to industry, utilities, academia, and the public sector. We will maintain clear feedback loops to demonstrate how input informs updates and new initiatives. This iterative approach ensures that the roadmap reflects both statewide priorities and community-level realities. It also accounts for the fast-changing landscape of AI, where progress is being made on a daily basis that has implications for every component of this roadmap.

Measure What Matters

Transparency and accountability will be central to implementation. Serving as a neutral scorekeeper, Team Pennsylvania will help policymakers, businesses, and other entities understand where progress is being made and where new focus is required by tracking against the key metrics outlined in the strategic goals, highlighting case studies that show real-world impact, and elevating regional spotlights that demonstrate advancement of the roadmap. This approach ensures both measurable accountability and compelling examples that make progress tangible across the Commonwealth.

Without a statewide convener, the risk is that energy, AI, and economic development efforts proceed in silos, missing opportunities for shared learning, equitable investment, and coordinated action. If left uncoordinated, the outcomes could include regional disparities in adoption, duplicative efforts, or lack of alignment between public investments and private innovation.

Organizations, References, and Appendices

- Organizations that lent time, insight, and expertise to develop the roadmap
- Foundational federal, state, and industry documents referenced in roadmap
- Glossary of acronyms and organizations
- Definitions used throughout roadmap

Participating Task Force Organizations

The Pennsylvania Energy, Data Centers, Artificial Intelligence Roadmap is the result of collaboration, and while the strategies and considerations reflect the broadest possible set of views, they do not imply a full endorsement by every participant of the Task Force.



Scan here to view the full list of
Participating Organizations

Foundational Documents in This Roadmap

A growing body of national research, industry analysis, and policy guidance informs the rapid evolution of energy systems, data infrastructure, and AI. The documents below represent a curated selection of foundational resources that shaped the framing and priorities in this roadmap.

- [America's AI Action Plan](#) – White House strategy outlining national priorities and initiatives for artificial intelligence development
- [Brookings: Mapping the AI Economy](#) – Analysis of regional readiness for economic transformation driven by artificial intelligence
- [BCG: Breaking Barriers to Data Center Growth](#) – Report examining challenges and opportunities for global data center expansion
- [Data Center Map](#) – Industry tracking of hyperscaler and edge infrastructure
- [Goldman Sachs: AI to Drive 165% Increase in Data Center Power Demand by 2030](#) – Forecast on AI-driven electricity demand growth from expanding data centers
- [McKinsey: The data center balance: How US states can navigate the opportunities and challenges](#) – Article identifying tradeoffs and key questions states should examine
- [PJM Interconnection: 2025 Load Report](#) – Annual report projecting regional electricity demand through detailed load forecasting

Organizations, References, and Appendices

Glossary of Acronyms

AI	Artificial Intelligence
CAISI	Center for AI Standards and Innovation (part of the U.S. Department of Commerce)
CBAs	Community Benefit Agreements
CCAP	County Commissioners Association of Pennsylvania
CHIPS	Creating Helpful Incentives to Produce Semiconductors and Science Act
CMU	Carnegie Mellon University
COGs	Councils of Governments
CTE	Career and Technical Education
DCED	Pennsylvania Department of Community and Economic Development
DEP	Pennsylvania Department of Environmental Protection
DHS	U.S. Department of Homeland Security
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOC	U.S. Department of Commerce
ED	U.S. Department of Education
FCC	Federal Communications Commission
FERC	Federal Energy Regulatory Commission
FTC	Federal Trade Commission
IC	Intelligence Community
ICTS	Information and Communications Technology and Services
OMB	Office of Management and Budget

Glossary of Acronyms

OSTP	Office of Science and Technology Policy
OTO	Governor’s Office of Transformation and Opportunity (Pennsylvania)
PA FastTrack	Pennsylvania Permit Fast Track Program
PA Sites	Pennsylvania Sites Program
PJM	PJM Interconnection (regional transmission organization serving Pennsylvania and surrounding states)
PML	Pennsylvania Municipal League
PSATS	Pennsylvania State Association of Township Supervisors
PSC	Pittsburgh Supercomputing Center
R&D	Research and Development
RTO	Regional Transmission Organization
SME	Small/medium enterprises
SMR	Small Modular Reactor (nuclear energy technology)

Definitions

AI-Enabled Energy System Transformation: The integration of artificial intelligence into energy generation, transmission, and distribution systems to improve forecasting, optimize grid operations, reduce costs, and accelerate deployment of new resources including predictive maintenance, demand management, efficiency modeling, and siting analysis, enabling a more resilient and adaptive energy system.

All-of-the-Above Energy Strategy: An approach to energy development that incorporates a mix of natural gas, nuclear, renewables paired with long-duration energy storage, and fuel cells, with the goal of ensuring reliability, affordability, and sustainability.

Compute Resilience: The ability of Pennsylvania’s energy and data infrastructure to reliably support high-performance computing and AI applications under conditions of rapid demand growth and evolving technology.

Firm Power: Electricity that is guaranteed to be available at all times, regardless of weather or season, in contrast to intermittent sources such as wind or solar.

Glossary of Acronyms

Innovation Corridors/Regional AI-Activated Corridors: Regional development zones anchored by AI, advanced industry, and energy infrastructure, designed to concentrate resources, attract investment, and deliver broad-based economic benefits.

Next-Generation Energy System Transformation: The integration of next-generation technologies into energy generation, transmission, and distribution systems to improve forecasting, optimize grid operations, reduce costs, and accelerate deployment of new resources including predictive maintenance, demand management, efficiency modeling, and siting analysis, enabling a more resilient and adaptive energy system.

No-Bottleneck Sites: Prequalified parcels of land that are zoned, permitted, and interconnection-ready, reducing delays and providing developers with clear, accelerated pathways for project deployment.

No-Wrong-Door: A customer-service model that ensures communities and applicants can access the right contacts and resources across agencies, regardless of entry point.

Talent Readiness Index: A benchmarking tool to assess the availability of skilled workers for AI, energy, and data center projects, including measures of training pipeline capacity, graduation rates, and regional workforce participation.

The Commonwealth/The State: When capitalized, these terms refer specifically to the Commonwealth of Pennsylvania and its formal institutions of state government, including the Governor's Office, executive agencies, and the General Assembly.

the Commonwealth/the state: When written in lowercase, these terms refer to Pennsylvania in its broader sense as one of the fifty U.S. states, encompassing its geography, economy, communities, and people, rather than its formal governmental structure.

Unregulated State: A state in which electricity generation is separated from transmission and distribution. In this model, power plants are financed and operated at developer risk, while utilities remain responsible for delivering electricity through transmission and distribution networks.

Workforce Frameworks: Structured programs that align career-connected learning, apprenticeships, and certifications with industry needs in AI, energy, and advanced manufacturing, ensuring a steady pipeline of qualified talent.

Frequently Asked Questions

► **Why did Team Pennsylvania produce this roadmap, and why now?**

The roadmap was developed in response to both immediate opportunities and long-term challenges facing Pennsylvania. Major announcements around energy investment, data centers, and artificial intelligence highlighted the need for a coordinated strategy to ensure the Commonwealth captures maximum economic, talent, and community benefits. Producing the roadmap provides timely guidance to decision-makers as these industries are scaling rapidly, while also positioning Pennsylvania for sustained competitiveness over the next decade. It reflects the urgency voiced by stakeholders at the Pennsylvania Energy and Innovation Summit and recent AI convenings, as well as the recognition that waiting would risk losing momentum and missing critical opportunities.

► **Who is the audience for this roadmap?**

This roadmap is written for Pennsylvania policymakers, industry leaders, utilities, higher education institutions, community organizations, and other stakeholders engaged in energy, data center, and AI development. It is intended to provide both high-level direction and practical actions that these groups can use to inform and guide decisions, partnerships, and investments.

► **How should I read this roadmap?**

The roadmap is designed to be navigated, not read cover to cover. Because the issues it addresses overlap and repeat across themes, readers may find sections that echo or reinforce others. We encourage you to begin with the Executive Summary for an overview of Pennsylvania's unique opportunity, and then explore the specific sections most relevant to your interests, such as near-term actions or important dynamics.

► **What happens next?**

This roadmap builds on the discussions at the Pennsylvania Energy and Innovation Summit (July 2025) and the recent AI Horizons event in Pittsburgh and sets a 10-year timeframe for action. It is not an endpoint but a starting point for collaboration. The next step is for organizations and individuals across the Commonwealth to convene, deliberate, coordinate, and take action on the strategies laid out here.

► **My area of interest is not covered in this roadmap. What should I do?**

We know this roadmap cannot cover every issue in depth. If your area of interest is not included, we invite you to share feedback through our Roadmap Feedback Survey. By telling us what topics matter most, who should be involved, and how your work connects to this effort, you can help inform future updates and ensure Pennsylvania's strategy reflects the full range of expertise and opportunity.

► **How will progress be tracked?**

Progress will be tracked through periodic updates and reporting on key metrics identified in the roadmap. Team Pennsylvania and partner organizations will work with state agencies, industry leaders, and academic institutions to ensure transparency and accountability.

Survey

We invite you to share how you see yourself in the roadmap, what priorities matter most, and how you can help carry this work forward.



Scan here to take the survey.



TEAMPA.COM

303 Walnut Street, Suite 204 Harrisburg, Pennsylvania 17101

