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STATE OF THE GRID

QUARTER 3, 2026

Connecting the dots for a smarter energy future.

Expert consulting services tailored to utilities and their vendors, focusing on Grid Modernization, System Operations, System Planning, and Wholesale/Retail Market Operations.

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Welcome to our newsletter!

Welcome to our Q3 2026 newsletter. Each quarter, we gather the industry news, insights, and emerging trends that catch our attention and help illuminate where grid modernization is heading. This issue brings together the developments shaping the landscape, from rising load and new flexibility models to geothermal expansion and interconnection reform. We're glad you're reading, and we'd love to hear what resonates with you.

INDUSTRY EVENTS

Novara Energy Summit

October 7 in Spokane, WA

The Novara Energy Summit 2026 brought together utility leaders, policymakers, and innovators to discuss grid modernization, clean-energy deployment, and emerging resilience strategies. JD Hammerly attended, joining peers for sessions on transmission planning, market design, and the evolving role of advanced technologies in the energy transition.

RE+

November 16-19 in Las Vegas, NV

RE+ is relevant for utilities tracking solar, storage, distributed energy resources, clean energy procurement, interconnection, and market development. It is particularly useful for strategy, market, planning, and grid teams assessing how generation and distributed resource growth will affect utility operations. More info [here](#).

NW Energy Coalition Fall Conference

October 15 in Seattle, WA

Come together with regional energy experts, advocates, utility leaders, business representatives, and policymakers from across WA, OR, ID, and MT to pause and reflect on where we are in the energy transition and how we continue moving toward a clean, affordable, and equitable energy system. The NW Energy Coalition 2026 Fall Conference, titled *People and Power in the Energy Transition*, takes place on Thursday, October 15, 2026, from 9:00 a.m. to 5:00 p.m. at the University of Washington Husky Union Building in Seattle. More info [here](#).

Advanced Energy Conference (AEC)

November 4-6 in New York, NY

Features a dedicated Grid Modernization & Resilience track focused on migrating from pilot projects to utility-scale distribution. More info [here](#).

It's the final countdown!

We've been sharing updates on this book for a while now, and it's officially in its final countdown. The last touches are underway, and *OMS Unlocked: Pathways to Successful Implementations* will be available soon on Amazon in eBook, paperback, and hardcover.

Thank you for staying with us through the journey. We're almost ready for liftoff!



M&A

NextEra–Dominion deal faces opposition despite new benefits package

NextEra and Dominion announced an expanded Virginia benefits package — including extended residential bill credits, new jobs, and accelerated clean-energy development — as part of their proposed \$67 billion merger, which, if successful, would create the largest regulated utility in the world with 10 million customers in four states and a 130-GW large load pipeline. But political pushback is intensifying. Virginia’s lieutenant governor has formally opposed the deal, citing affordability concerns and skepticism that the merger would benefit ratepayers. Read more [here](#) and [here](#).

Deloitte: Data center demand drives record utility sector M&A

Deloitte’s latest power sector M&A analysis finds that U.S. utilities are pursuing deals at unprecedented scale as data center growth accelerates electricity demand and tightens reliability constraints. The report shows 2025 transactions reaching \$142B across 157 deals, with 144 GW of capacity changing hands — a shift toward buying deliverable, dispatchable power and large portfolios to secure capacity under “speed, scale, and scarcity” pressures. [Read more.](#)

ABB to acquire Advantics

ABB agreed to acquire Advantics, a German specialist in direct-current power systems, strengthening ABB’s position in fast-growing DC applications across data centers, EV infrastructure and industrial power. The deal adds advanced control software and modular DC technology to ABB’s Electrification business, supporting its strategy to scale next-generation power conversion solutions. [Read more.](#)

Iberdrola to acquire 80% of Finnish utility Caruna

Iberdrola agreed to buy an 80% stake in Finnish distribution utility Caruna for €2.3 billion, marking one of

its largest grid-focused acquisitions in Europe. The deal expands Iberdrola’s regulated network footprint in the Nordics and adds a sizable, modern distribution business serving 750,000 customers. The company said the move aligns with its strategy to scale stable, regulated grid assets that support electrification and renewables growth. [Read more.](#)

Vertiv acquires Utility Innovation

Vertiv has acquired Utility Innovation, adding advanced microgrid controls, power-management software, and behind-the-meter resilience solutions that strengthen Vertiv’s position in fast-growing data center and grid modernization markets. The deal expands Vertiv’s ability

to support utilities and large loads with more flexible, distributed, and digitally managed power systems — all increasingly critical as grid capacity tightens. [Read more.](#)

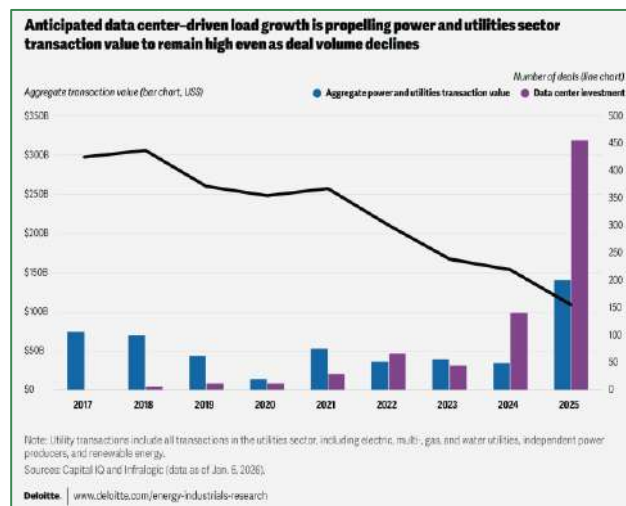
nVent to acquire Maverick Power

nVent announced plans to acquire Maverick Power, adding engineered power-distribution systems and utility-grade infrastructure solutions that strengthen its position in

grid-modernization and electrification markets. The deal expands nVent’s capabilities in medium-voltage equipment, modular power systems, and advanced protection technologies, all critical as utilities confront rising load growth and capacity constraints. [Read more.](#)

SE acquires AiDash for grid resilience boost

Schneider Electric will acquire AiDash for \$350 million, adding satellite- and AI-driven vegetation management, asset monitoring, and outage prediction tools to its grid resilience portfolio. The deal strengthens Schneider’s ability to help utilities manage climate-driven risk and improve reliability through more precise, data-rich planning and automated decision support — key capabilities as distribution systems face rising load and weather volatility. [Read more.](#)



KEY HIGHLIGHTS

UK confirms launch of Great British Grid

The UK has formally launched the Great British Grid (GBG), a new publicly owned body within Great British Energy designed to accelerate electricity network build-out and cut long connection delays. GBG will invest alongside private operators to modernize and expand the grid, support faster project interconnections, and strengthen energy security. The initiative accompanies major reforms with the National Energy System Operator (NESO) and Ofgem to clear the connections backlog—removing more than 300 GW of speculative projects—and to expand self-build options that have shortened timelines by up to 11 months in Ireland. Competitive tendering for transmission projects will also widen participation and drive down costs. [Read more.](#)

California achieves world's first solar-dominated grid milestone

California set a global first in May when solar briefly supplied the largest share of electricity ever recorded for a major power system, with utility-scale and rooftop PV meeting nearly all midday demand. The milestone highlights both the state's rapid solar buildout and the growing need for storage and flexible resources as solar becomes the dominant daytime supply. [Read more.](#)

Space-Solar PPA marks first-of-its-kind deal

Virtus Solis has signed the world's first commercial space-solar PPA, a 20-year deal to deliver 250 MW of 24/7 orbital baseload clean power to Brae Systems' subsea AI data centers. The multi-billion-dollar agreement uses radio frequency power beaming from orbital solar arrays to provide firm, zero-carbon electricity—positioning space-based generation as a new frontier for high-density compute infrastructure. [Read more.](#)

Google signs record 396 MW geothermal deal with Fervo

Google signed a landmark 396 MW enhanced-geothermal PPA with Fervo Energy, the largest corporate geothermal deal to date and the first to assemble a multi-state

portfolio of firm, carbon-free power for 24/7 operations.

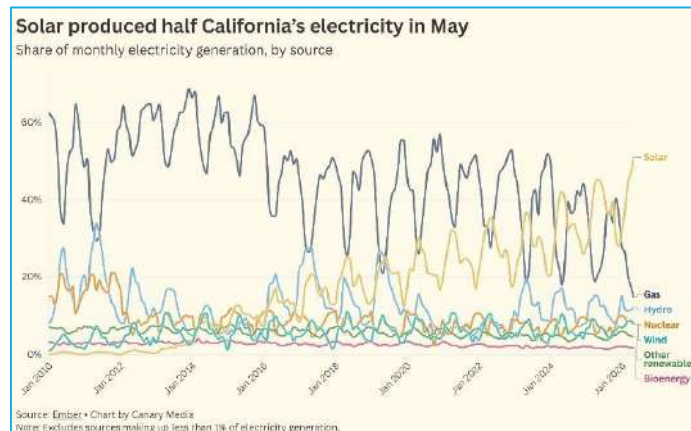
[Read more.](#)

BPA reconsiders Markets+ in favor of CAISO's EDAM

Bonneville Power Administration is reassessing its earlier decision to join SPP's Markets+ and is now weighing a shift to CAISO's Extended Day-Ahead Market (EDAM). Administrator Travis Kavulla outlined governance, market-liquidity, and reliability concerns with Markets+, noting EDAM's deeper trading pool and recent governance reforms. BPA expects to issue a draft decision by year-end, a move that could significantly influence Western market formation given its large hydro fleet and extensive transmission footprint. [Read more.](#)

DOE Issues final EIS for North Plains Connector HVDC line

The U.S. Department of Energy and Montana Department of Environmental Quality released the Final Environmental Impact Statement (EIS) for the North Plains Connector, a proposed 422-mile, 3,000-MW HVDC line linking the Eastern and Western



Interconnections. The milestone keeps the project's federal review on an accelerated timeline and advances a major new transfer path to improve reliability, resilience, and access to generation across Montana, North Dakota, and the broader national grid. [Read more.](#)

California legalizes plug-in "balcony solar," expanding access to home clean energy

California has officially legalized plug-in balcony solar systems, allowing renters and homeowners to install small, UL-certified solar panels that plug directly into a standard outlet without a utility interconnection agreement. The move opens the market to low-cost, easy-to-deploy solar and supports U.S. grid modernization by enabling more distributed generation, reducing household demand on local feeders, and giving millions of residents a new way to participate in grid-supporting clean energy. [Read more.](#)

KEY HIGHLIGHTS

Pennsylvania PUC study flags rising reliability risks from data center load

A new Pennsylvania PUC-commissioned analysis warns that fast-growing data-center demand could push PJM's reliability risk well above planning standards by 2030, underscoring the need for accelerated supply and infrastructure action across the region. [Read the report \(PDF\)](#).

2026 report finds utilities facing a growing resilience gap

The 2026 State of Grid Resilience report — researched by Zpryme and sponsored by S&C Electric Company — shows utilities confronting rising operational risk, accelerating load growth, and affordability pressures, with distribution-level automation and hardening emerging as the biggest yet still under-deployed levers to close the resilience gap. The report is free, but behind a data wall. See key findings to the right and [read more](#).

Big batteries stall in interconnection queues

A Bloomberg report highlights that large battery-storage projects used to stabilize the grid and integrate more renewables are increasingly stuck in interconnection limbo. Nationwide, 750 GW of storage projects are waiting for grid connections, according to Lawrence Berkeley National Laboratory, with median wait times stretching to five years by 2025, up from just 18 months in 2015. Berkeley Lab researchers note that the surge in battery proposals has “log-jammed” traditional transmission-operator processes, straining transformer and substation supply chains and slowing the infrastructure upgrades needed to support modern, flexible, renewable-heavy grids. [Read more](#).

Rising investment signals a breakout moment for VPPs

Two major deals underscore accelerating momentum behind Virtual Power Plants (VPPs) in the U.S. energy market. [Light's \\$46M raise](#) expands its API-driven platform that lets solar, battery, mobility, and proptech companies bundle behind-the-meter DERs with VPP participation, making flexible load and distributed

generation easier to aggregate at scale. At the same time, Octopus Energy's investment in [Uplight aims to double U.S. grid flexibility](#) and deliver \$1B in customer savings by expanding demand-side orchestration across millions of households. Together, these moves highlight a rapidly growing market belief that VPPs—combining DERs, automation, and customer-centric energy services—are becoming a core grid modernization tool

for managing rising load and improving resilience.

Sunrun & Tesla deliver historic 580 MW VPP boost to California's grid

Speaking of VPPs, Sunrun and Tesla have jointly dispatched 580 MW of home solar-plus-storage into California's grid — the largest residential Virtual Power Plant contribution ever recorded in the U.S. The milestone shows how aggregated behind-the-meter batteries are becoming a meaningful reliability resource, helping California manage peak demand, reduce strain on aging infrastructure, and accelerate the

shift toward a more flexible, modernized grid built on distributed energy. [Read more](#).

Google expands nuclear portfolio to power AI growth

Google is deepening its commitment to 24/7 carbon-free energy with four major nuclear investments: the Duane Arnold Energy Center restart with NextEra Energy, advanced reactor development with Elementl Power, a planned Kairos Power fleet expected to reach 500 MW by 2035, and a landmark agreement with Constellation to bring 890 MW of new nuclear capacity to the PJM grid. Together, these projects aim to supply reliable baseload power for Google's rapidly growing AI and data-center operations while accelerating next-generation nuclear deployment. Recent market reactions underscore the momentum — Australian uranium stocks rallied following the Google–Constellation announcement, reflecting broader investor interest in nuclear's role in the clean-energy transition. [Read more](#).



FEATURED ARTICLE

INSIDE AI MODELS: WHAT UTILITY LEADERS NEED TO KNOW

By John (JD) Hammerly, CEO, The Glarus Group

Artificial intelligence is quickly becoming a strategic capability across all industry sectors. The electric power sector is approaching AI adoption thoughtfully, focusing on where it can deliver the most value. Utilities are exploring AI to strengthen reliability, streamline operations, accelerate planning cycles, and improve customer engagement, all while navigating rising data volumes and evolving regulatory expectations.

Understanding how Large Language Models (LLMs) work is essential for leaders deciding where AI can deliver meaningful value and where risks must be managed. This overview explains how LLMs are built, trained, and used, and highlights considerations that matter specifically for utilities: data governance, model accuracy, operational integration, and the computing demands that influence both IT and grid-planning decisions.

AI systems contain LLMs that consume, process, and generate text. LLM training develops its capabilities and improves accuracy, while inference applies them to a request called a prompt. Organizations may capture, build, and train a model themselves, or use an existing trained model, often without further training.

Creating or acquiring a model

An LLM combines mathematical architecture with adjustable numerical parameters, or weights. Creating one requires selecting the architecture and preparing training data. Whether an organization builds or acquires an LLM, it can use the model as is or adapt it to specific tasks. Sufficient training can reduce LLMs' mistakes and bias but cannot eliminate them entirely or in every response.

Training the model

Training uses examples to adjust and validate the model's weights, enabling it to learn language patterns and relationships that may be general or specific to a particular application. The model also requires fitting, which ensures the model captures the underlying

patterns, structures, and factual relationships in the data. It can then be further trained to improve instruction by aligning to specific tasks or fine-tuning the model, such as classifying maintenance reports or health diagnoses.



John (JD) Hammerly

What the trained model contains

A trained model comprises learned numerical weights and information that define its structure. The weight database stores the learned information rather than documents in a conventional database. AI frontend uses the tokenizer to parse your prompt into tokens and generate its response based on the weights database.

Using the model through inference

Normal inference does not change the model's weights. Conversation history and supplied documents can shape an answer without retraining. Applications may also use web search, document retrieval, or calculators to refine context and improve responses. When you submit a prompt, the tokenizer parses it into tokens, which can be phrases, words, word parts, or punctuation. The model uses the supplied context to assign probabilities to possible next tokens. The system selects a token, adds it to the response, and repeats. The context includes the answer generated so far, subject to the model's context window, which is the amount of text converted to tokens that it can work with at once.

Given the prompt "The power plant generates...", the model predicts what comes next, such as "electricity." Training software compares its predictions with the actual tokens in the example and adjusts the weights to reduce prediction errors. Applying this across repeated examples teaches language patterns and relationships.

Computing and electricity requirements

Training a large model requires substantial computing power, memory, time, and electricity. Answering a single prompt requires far less computation than training. At scale, however, inference can create substantial computing and electricity demand, because demand varies with model size, prompt volume, input (tokens), output length, and required response speed.

For electric-utility leaders, AI model mechanics are no longer an abstract technical topic; they shape real decisions about investment, risk, and operational strategy, and affect real outcomes like reliability. LLM-powered tools will increasingly support operations, engineering analysis, customer communications, regulatory reporting, and internal knowledge

management. Their effectiveness depends on high-quality data, careful alignment to utility-specific tasks, and disciplined oversight to ensure accuracy and trustworthiness.

The key takeaway

AI will not replace engineering judgment or operational expertise, but it can augment both. Leaders who understand how these models learn, infer, and consume computing resources will be better positioned to evaluate vendors, guide internal adoption, and ensure AI contributes to reliability, resilience, and customer value. As utilities advance their modernization agendas, this foundational understanding becomes a strategic advantage.

FEATURED ARTICLE

THE FUTURE OF DATA CENTERS

By John (JD) Hammerly, CEO, The Glarus Group

Access to reliable power increasingly determines where data centers can be built and when they can earn revenue. It is all about time-to-power. Still, advances in cooling, power delivery, and computing density can reduce resource use per unit of computation, but do not guarantee lower total demand or lower electricity bills. The central challenge is turning these improvements into faster development, measurable community protections, and infrastructure investments that benefit, rather than burden, existing utility customers.

Developers design data centers for specific computing workloads, fixed capital depreciation schedules, and stringent tenant service-level agreements. A new data center must be commercially and technologically competitive, so it must incorporate the latest innovations and advances. Legacy enterprise cloud warehouses, high-density artificial intelligence clusters, and modular distributed facilities will coexist well beyond 2027, but must invest in technology upgrades and retrofits to remain competitive, spurring continued improvements in water use, noise control, power density, and electrical resilience.

For developers' investments to generate the anticipated return, time to operations remains critical in a competitive marketplace. Data center developers need clear, forward-looking permitting, sound utility policy, and disciplined engineering. Commercially durable projects need credible environmental protections, clear responsibility for infrastructure costs, and predictable tax obligations. Establishing these requirements early reduces approval uncertainty, lowers the risk of later disputes, and improves community acceptance.

Several key technological advances are driving this shift.

Liquid and direct-to-chip cooling reduce water use

In these systems, dielectric or treated fluids circulate through micro-channel cold plates mounted directly over high-heat processors. In full immersion systems, the entire server chassis is submerged in thermally conductive dielectric fluid. Both methods transfer heat far more efficiently than legacy forced-air cooling,

enabling thermal management for 250-kilowatt racks that will be installed soon. Newer silicon architectures also tolerate much higher operating fluid temperatures, enabling warmer supply loops that slash overall refrigeration energy requirements.

Closed server loops isolate coolant fluids, eliminating the massive evaporative losses inherent to traditional cooling towers. Closed-circuit dry cooling dissipates thermal energy without evaporative water consumption, while hybrid systems deploy minimal water sprays only during extreme summer peaks. Although closed water loops require an initial charge and a small volume of makeup water, immersion architectures operate entirely water-free. Cooler northern climates naturally expand annual dry-cooling hours, though wholesale transmission capacity, fiber paths, and zoning speed ultimately dictate project viability.

Electrical efficiency and PUE economics

Data center efficiency is measured by Power Usage Effectiveness (PUE), which is calculated as total facility energy intake divided by the IT compute energy load, measuring facility overhead. PUE accounts for cooling systems, transformer step-down losses, uninterruptible power supply (UPS) conversions, and auxiliary loads. While legacy facilities hover near 1.5 PUE, modern designs target 1.2 or better; a lower PUE means less non-IT electricity consumption. This means a data center can deliver more computational work with the same energy, or reduce its electricity consumption. In real terms, a 1.5 PUE system has non-IT overhead that accounts for one-third of total energy intake, while a 1.2 PUE system drops non-IT overhead to one-sixth. In several locations, community permitting processes require a forecasted, monitored, and reported PUE for allowing data centers to be built and operated.

Acoustic engineering attenuates ambient noise

While direct-to-chip cooling eliminates thousands of high-RPM chassis fans, external heat rejection infrastructure remains an acoustic challenge. Roof-mounted dry coolers, liquid chillers, step-down

transformers, and emergency diesel or natural gas backup generators can generate persistent, low-frequency hum. Many communities have existing or emerging noise emission standards that require noise mitigation, measured through enforceable property-line decibel limits. To comply, a data center must deploy low-frequency sound attenuation, acoustic baffling, and compliance monitoring of auditory emissions during peak summer conditions, full-load operation, and scheduled backup generator testing.

Behind-the-meter generation shifts the grid burden

On-site generation can reduce or defer multimillion-dollar utility investments in transmission expansion and new generation, but it is unlikely to eliminate the need for utility investment. Facilities generating continuous power behind the meter must manage fuel logistics, maintenance outages, and emergency contingencies. Disconnecting and operating as an electrical island requires robust black-start assets, frequency-control equipment, and synchronizing switchgear to disconnect from and reconnect to the transmission network safely.

Self-supply carbon-free options face steep capacity factor limits because renewables are highly intermittent. Renewables generate electricity for less than 40 percent of annual hours because of darkness, cloud cover, and calm wind conditions. Hybrid microgrids that combine solar or wind with battery energy storage, or use reciprocating engines or micro-turbines to firm the electricity supply, can achieve 90 percent availability. However, all on-site configurations require fast-

discharge battery storage to bridge millisecond interruptions while backup generation ramps to full output. Workload architectures must either guarantee instantaneous local power continuity or migrate workloads across high-speed optical links to sister data centers in under a second.

Why Data Center Evolution Matters to Electric Utilities

- **Load Growth:** Ultra-dense AI clusters can add large, fast-ramping loads that reshape local and regional forecasts.
- **Interconnection Demands:** High-voltage DC systems, liquid cooling, and microgrid configurations require more complex study cycles and protection schemes.
- **Infrastructure Costs:** Even efficient facilities drive significant transmission, substation, and generation reinforcement; costs that must be allocated to the cost-causing party.
- **Reliability Expectations:** Continuous, high-quality power is non-negotiable for AI workloads, raising expectations for grid stability and outage response.
- **Regulatory Scrutiny:** Commissions increasingly expect clear cost-causer structures, enforceable interruptible contracts, and transparent capacity reservation terms.

Bottom line: Data center growth is now a core grid-planning issue. Understanding emerging technologies helps utilities negotiate smarter contracts and protect system reliability.

Clean energy transition and transmission realities

Replacing firm thermal generation with clean resources while maintaining grid stability requires immense capital investment in long-duration storage and regional transmission lines. All three components drive up retail electricity rates. Delivered electricity costs must fund not only wind and solar assets, but also battery storage that shifts intermittent electrons over time and high-voltage lines that move power across geography.

Furthermore, matching the firm availability of retired fossil units requires 2.5 to 4 times the installed nameplate capacity in geographically dispersed renewables. Without interregional transmission to wheel this dispersed energy to load centers, supply deficits and price volatility follow. Storage shifts the timing between when energy is produced and when it is consumed, but it is finite, incurs losses during

charge/discharge, and is economically optimal only for short durations. Private power purchases from merchant renewable or fossil assets do not offset local distribution and transmission reinforcement costs.

Allocating all costs to the cost-causing load

Large industrial computing customers can improve system-wide utility affordability by maximizing transmission asset utilization and distributing fixed utility costs across a wider rate base. However, state public utility commissions must enforce strict cost-causer ratemaking. Data center supply contracts must

fully cover incremental generation procurement, dedicated grid and substation construction, spinning reserves, and local system upgrades.

Interconnection agreements must incorporate take-or-pay capacity reservation fees, minimum billing thresholds, and credit collateral requirements to ensure ratepayers are not left stranded if compute tenants reduce load or terminate operations prematurely. Interruptible power contracts provide valuable grid relief only when demand reductions are verifiable, enforceable, and seamlessly paired with on-site generation or workload shift to a sister data center.

Conclusion

Data center innovation matters when it improves development economics and outcomes for host communities. Developers need predictable approval timelines and deliverable power; utilities need commitments that justify long-lived investments; existing customers need protection from costs they did not cause. Permitting and utility agreements should therefore set measurable water and noise limits, require transparent energy-performance reporting, and enforce obligations for infrastructure and backup service. Projects that demonstrate these protections should have a clear, timely path to approval and operation. Faster development and customer protection can reinforce each other when performance is verified, and financial responsibility is settled before construction. These decisions determine whether data center growth strengthens the local economy and utility cost structure or leaves communities carrying its costs.

Early Praise for Dr. Vadari's Latest Book

As *OMS Unlocked: Pathways to Successful Implementations* neared completion, Dr. Vadari enlisted experienced OMS practitioners to pressure-test the material and validate its real-world relevance.

Their perspectives follow.

"This book is a must-read for anyone contemplating implementing a new OMS, upgrading an existing one, or simply focusing on keeping the lights on."

— Michael Pesin, Deputy Assistant Secretary, U.S. Department of Energy

"If 'brevity is the soul of wit,' this book drives to the soul of an OMS and its implementation. Dr. Vadari brings deep industry and control software knowledge to this discussion, offering clarity, history, and practical guidance in equal measure."

— Michael Atkinson, SVP, Grid Automation, NAM, Hitachi Energy (Retired)

"This book delivers what the industry needs now: a clear view of where these systems originated, where they are today, and where they must go to build the grid of the future."

— Mahesh Sudhakaran, General Manager, Grid Software, GE Vernova

"Dr. Vadari's broad industry exposure across technology, products, and consulting gives this work credibility and practical relevance. It is a thoughtful contribution to the field and a valuable guide for utilities seeking to realize the full potential of their OMS investments."

— Young Ngo, CTO, Survalent, President, Themis Intelligence

"For executives and operational leaders alike, this is a valuable resource for strengthening implementation governance and delivering the reliability and service our communities expect."

— Dan Koch, Chief Operating Officer, Chelan County PUD



The softcover/hardcover book and eBook are coming soon. Stay tuned for more news on their release.

OMS Unlocked: Pathways to Successful Implementations

By Dr. Mani Vadari, President, Modern Grid Solutions

In his new book, *OMS Unlocked: Pathways to Successful Implementations*, Dr. Vadari provides a clear, experience-driven guide to understanding and implementing Outage Management Systems at a time when utilities face rising grid complexity, intensifying weather events, and increasing customer expectations. Drawing on decades of work across utilities, vendors, and system integrators, he breaks down the technical, operational, and organizational factors that determine whether an OMS implementation succeeds or struggles.

What's in It

Foundations of Outage Management: Outages, OMS basics, and the evolution of outage management

OMS Core Functions: Capabilities, benefits, and the OMS operating model

Implementation Drivers: Electrical modeling, business processes, and system integrations

Implementation Pathways: Stand-alone OMS, integrated ADMS approaches

Utility Best Practices: Procurement readiness, vendor selection, implementation governance

Vendor Strategies: OT-utility relationships, partner ecosystems, scalable delivery models

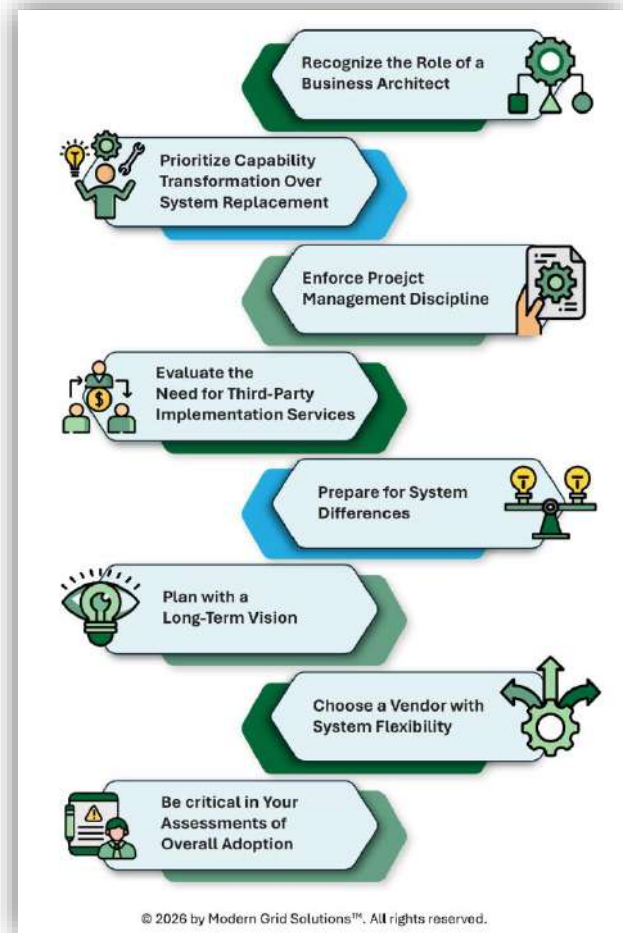
Future Outlook: Technology trends, resilience expectations, and emerging OMS delivery models

Why Read It

OMS implementations often struggle not because the technology is insufficient, but because utilities underestimate the complexity of modeling, integration, and operational alignment. *OMS Unlocked* reframes OMS as strategic infrastructure and provides a clear roadmap for utilities, vendors, and integrators navigating modern outage management challenges.

The book highlights the importance of clarity of purpose, accurate modeling, strong integration discipline, and readiness for real-world pressure — especially as DERs, VPPs, bi-directional flow, and extreme weather reshape grid operations. It's written for a broad audience, from interns to executives, and offers practical guidance for achieving predictable, sustainable OMS outcomes.

Stay tuned for information on its release in paperback, hardcover, and eBook on Amazon!



OMS Implementation Key Success Factors

WATT'S on M[💡]NI'S MIND?

DATA CENTER MORATORIUMS: THE REAL CONSTRAINT IS COORDINATION CAPACITY

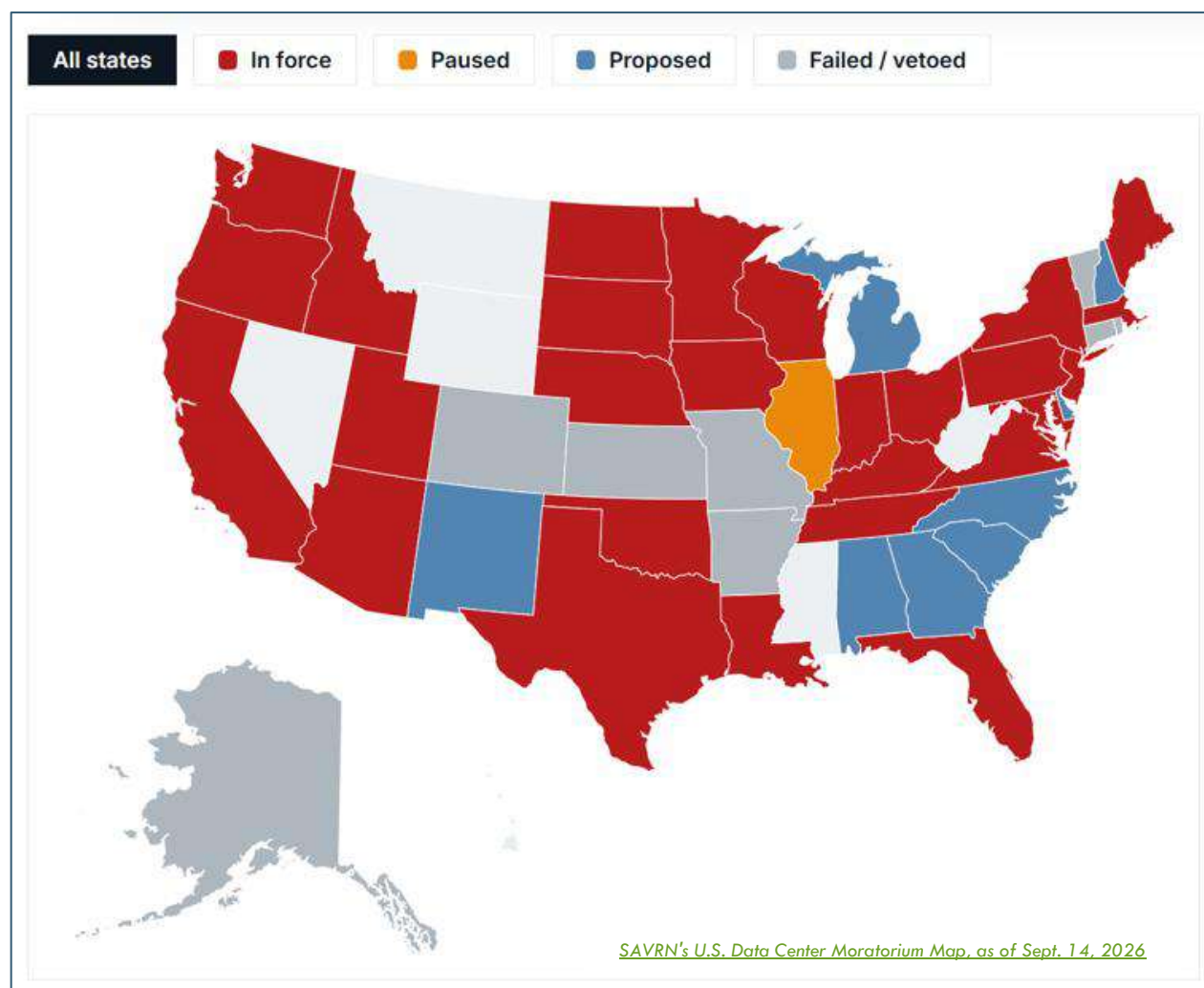
By Dr. Mani Vadari, President, Modern Grid Solutions

Across the United States, communities are pausing or restricting data center development at a scale we've never seen before. According to [SAVRN's Data Center Moratorium Tracker](#), currently more than 360 local jurisdictions across 43 states have adopted some form of data center moratorium, pause, siting restriction, or related measure, illustrating the growing local response to rapid data center development.

But the proliferation of moratoria is not the headline. The headline is what these pauses reveal:

This is not a story about opposition to data centers. It's a story about an institutional mismatch between the speed of digital demand and the speed of regulatory, utility, and community decision-making. It is also a story about how widespread misinformation has distorted public understanding of the issue.

AI-driven load growth is outpacing the coordination capacity of the institutions responsible for planning, permitting, and governing large loads.



Why moratoria are rising

In my recent “Watt’s on Mani’s Mind” blog on [Demystifying Data Center Myths](#), I highlighted how misinformation is shaping public perception, from fears of skyrocketing rates to concerns about water contamination or unchecked land-use impacts. These narratives spread faster than the facts, and moratoria often become a defensive response to uncertainty rather than a reflection of actual impacts.

At the same time, my two-part series on [Energy, Computing, Data, and Intelligence](#) underscored a deeper challenge: the convergence of digital and physical infrastructure is accelerating far faster than the institutions responsible for managing it. AI-driven load growth is not incremental; it is systemic and goes far beyond AI. And systemic growth requires systemic coordination.

Moratoria sit at the intersection of these two forces:

- Misinformation and fragmented public understanding
- Institutional processes that cannot yet operate at the tempo of modern digital demand

While some communities are rejecting data centers, the broader signal is that the current coordination framework is falling short, highlighting the need for better communication and more effective ways to ensure unbiased, factual information reaches all stakeholders.

A multi-faceted solution: What it will take to move beyond moratoria

Moratoria are not the end state. They are the pause before a new coordination model emerges. Moving beyond them will require a multi-faceted approach that addresses both institutional capacity and public understanding.

1. Strengthen coordination across agencies

Utilities, regulators, water authorities, zoning boards, and environmental agencies need synchronized processes, shared forecasting models, and parallel decision pathways. This is the core institutional modernization challenge, and the foundation for long-term stability.

2. Stakeholder engagement and communications

Communities need clear, accessible explanations of:

- What data centers actually consume
- How rates are protected through regulation at the federal and state levels
- How water is managed
- What environmental safeguards exist
- What benefits accrue locally

My [Data Center Myths article](#) provides a strong starting point for this work.

3. Clearing out misinformation

Moratoria often arise from fears that:

- Rates will spike – In fact, residential electricity rates haven’t meaningfully spiked in states with lots of data centers, and recent price changes show no statistically significant link to AI-driven demand.¹
- Water will be polluted – While this was true in the past, modern closed-loop cooling systems have largely addressed these concerns.
- Land use demands will be excessive – They are not. A recent NYU study shows that 97.5% of U.S. data centers are located on smaller urban or near-urban parcels rather than the large rural tracts typical of many industrial uses.²

These concerns must be addressed directly with transparent data, case studies, and regulatory guardrails. The Clarion Ledger recently reported that data centers helped lower Mississippi Power bills by stabilizing load and improving cost recovery – a powerful counter-narrative to the “data centers raise rates” myth.³ Entergy has likewise reported that agreements with data center customers are generating direct savings for ratepayers by shifting a larger share of grid investment and maintenance costs away from existing customers.⁴

4. Restating the benefits across all segments of the community

Data centers can:

- Raise the tax base
- Fund infrastructure improvements
- Strengthen electric infrastructure

- Support schools
- Bring fiber and broadband into underserved areas
- Catalyze local economic development

These benefits must be communicated consistently and backed by real examples. As I wrote in a previous [Watt's on Mani's Mind post](#), discussions too often focus on perceived risks, yet large-load projects can also drive investment in grid upgrades, community services, and local development. When approached strategically, data center growth delivers shared value across utilities, governments, schools, businesses, and residents.

5. Policy, regulatory, and legislative outreach

State leaders need frameworks that reduce uncertainty, accelerate permitting, and ensure communities have the tools to evaluate large-load proposals without resorting to moratoria.

States like Virginia have demonstrated what effective policy, regulatory, and legislative outreach looks like: coordinated siting frameworks, proactive utility planning, and clear communication channels between developers, regulators, and communities.⁵ Mississippi offers another strong example of legislators, regulators, and utilities working together to show how data centers helped lower power bills, countering misinformation before it could drive moratoria.⁶ And in Oregon's Umatilla County, coordinated planning has delivered tangible community benefits, from school funding to broadband expansion.¹

6. Collaboration with the data center ecosystem

Better long-range planning with developers can:

- Give utilities visibility into future load
- Allow water systems to plan upgrades
- Support coordinated land development
- Reduce friction and emergency decision-making
- Create predictable, multi-year infrastructure pathways

With better plans, everyone wins.

Why this matters: My view as a grid modernization practitioner

In my recent writing on the convergence of energy, computing, data, and intelligence, I've argued that the next era of grid modernization will require these layers to be synchronized, not siloed.ⁱⁱ The moratorium wave clearly reflects that same challenge.

Utility digital transformation projects have already shown that technology succeeds only when the surrounding institutions are aligned. OMS, ADMS, DERMS, and forecasting platforms all deliver value only when planning, operations, IT, field organizations, and vendors coordinate around shared processes and decision pathways. The same lesson applies here except that it now involves multiple societal components: the constraint is not only the sophistication of the tools utilities use to forecast or interconnect new load; it's also the ability of agencies, utilities, regulators, and local governments to act in concert to deliver value to all.

AI demand is accelerating, but the institutions that govern energy, land use, water, and infrastructure are not keeping pace. In conjunction with misinformation, the result is friction: pauses, emergency ordinances, ratepayer-protection orders, moratoriums, and zoning freezes.

They are signals that the coordination architecture of the grid is overdue for modernization, and if not fixed, they become barriers to innovation.

To support the next decade of AI-driven load growth, we will need:

- Shared forecasting models across agencies, including data centers
- Synchronized permitting pathways for large loads
- Structured demand validation processes that distinguish speculative requests from forecasted and committed load growth
- Unified siting frameworks that reduce local uncertainty
- Integrated water-energy planning
- Transparent cost-allocation rules that prevent ratepayer impacts

- Real-time governance mechanisms that match the speed of AI growth
- Structured planning partnerships between data center developers and utilities to align long-term load growth with infrastructure investment

Moratoria are not the end state. They are the pause before a new coordination model emerges.

The opportunity ahead

In earlier sections, I noted that modern grid challenges increasingly sit at the intersection of energy, computing, data, and intelligence — a convergence that is reshaping both load growth and the institutions responsible for managing it. The convergence of energy, computing, data, and intelligence cannot succeed without a parallel convergence in how we plan, permit, and govern the infrastructure that supports it.

The bottleneck is not megawatts or water supply; it's the ability of institutions to coordinate at the speed required by modern digital growth. And nowhere is this more visible than in the rise of large data center clusters.

These facilities are becoming foundational to the next decade of AI-driven innovation, but they can only be integrated smoothly if utilities, regulators, and solution providers build the coordination capacity needed to evaluate, site, interconnect, and operate them without friction.

The opportunity ahead is clear: strengthen the institutional architecture, strengthen the communication and engagement of stakeholders, and the grid will be ready for the data center demands of the future.

¹ [USAFacts — Are AI data centers driving up your electric bill? A USAFacts deep dive](#)

² [NYU Tandon/Nature Cities - Inside the Urban Machine: Where America's Data Centers Actually Live](#)

³ [The Clarion Ledger — Entergy says Amazon's \\$25 billion MS expansion is helping your power bill](#)

⁴ [Entergy — Entergy customers begin seeing benefits from data center agreements...](#)

⁵ [Virginia Economic Development Partnership](#)

⁶ [Amazon News — How Amazon helps data center communities thrive](#)

DID YOU KNOW...

Utilities can now monitor vegetation from space?

Vegetation remains one of the most persistent reliability challenges for electric utilities. Trees and fast-growing species can create clearance issues between routine inspections, and storms often accelerate structural weaknesses that traditional patrols struggle to detect. Across North America, vegetation is the single most common cause of power outages, responsible for more than 20 percent of incidents nationwide, and these outages cost U.S. businesses billions each year.¹ The stakes are even higher in wildfire-prone regions: a 2023 analysis from the Gordon & Betty Moore Foundation found that wildfires impose more than \$117 billion in annual economic losses in California, including property damage, health impacts, and disruptions to businesses and communities.² A 2026 Pacific Northwest National Laboratory report further showed that 97 percent of acres burned in U.S. wildfires in 2025 were within 10 miles of transmission lines, underscoring how closely vegetation risk and grid infrastructure are connected.³



In response, satellite-based vegetation monitoring is becoming a promising tool for improving reliability and reducing risk. Traditional vegetation management uses scheduled ground patrols or periodic aerial LiDAR (Light Detection and Ranging) surveys. While these methods are effective, they are expensive, slow, and depend on crew availability, terrain, and weather. Completing a full inspection cycle can take weeks or months, and conditions may change before reports are finished.

Satellite monitoring helps fill this gap by offering frequent, wide-area visibility at much lower cost. Modern platforms use multispectral imagery, change-detection algorithms, and AI-driven risk scoring to spot encroachment, clearance issues, and hazard trees across entire service areas. Utilities no longer have to wait for the next patrol—they can check their networks weekly or even daily, catching new risks before they lead to outages or fires.

Utilities using these tools are already seeing real results. Satellite-AI systems have cut vegetation-related outages by 10 to 20 percent, sped up hazard-tree identification, and reduced inspection costs compared to traditional LiDAR surveys.⁴ Some platforms now monitor over 500,000 miles of power lines worldwide, showing they can scale across both transmission and distribution networks.⁵

Change detection is one of satellite monitoring's strongest features. Instead of just mapping vegetation, these systems compare images over time to see where growth has occurred, where trimming has happened, and where new risks are emerging. With weather data, utilities can focus on areas most likely to fail during storms, improving reliability and storm response planning.

Satellite monitoring doesn't replace field crews; it supports their work. By guiding crews to the highest-risk spots, utilities can make trimming cycles more efficient, reduce unnecessary patrols, and improve regulatory documentation. As demand increases, weather becomes more extreme, and wildfire risk rises, satellite-based vegetation monitoring offers a practical, scalable way to modernize resilience programs and lower outage- and wildfire-related costs.

¹ DOE: [Vegetation Management Resilience Investment Guide](#) — Vegetation is the most common cause of U.S. outages.

² Gordon and Betty Moore Foundation: [The Economic, Fiscal, and Environmental Costs of Wildfires in California](#) — Average annual wildfire losses in California exceed \$117.4 billion (2017–2021).

³ PNNL: [The Burn Rate: How Wildfire Impacts Energy Affordability, Part One \(2026\)](#) — 97% of 2025 burned acres were within 10 miles of transmission lines.

⁴ T&D World: [Hazard Tree Identification Features Satellite Technology and AI](#) — AI-powered satellite vegetation monitoring reduces vegetation management by 20-30%.

⁵ ESG News: [Schneider Electric Buys AiDASH in \\$350M Grid Deal](#) — A satellite-based vegetation management platform that monitors 500,000+ miles of power lines.

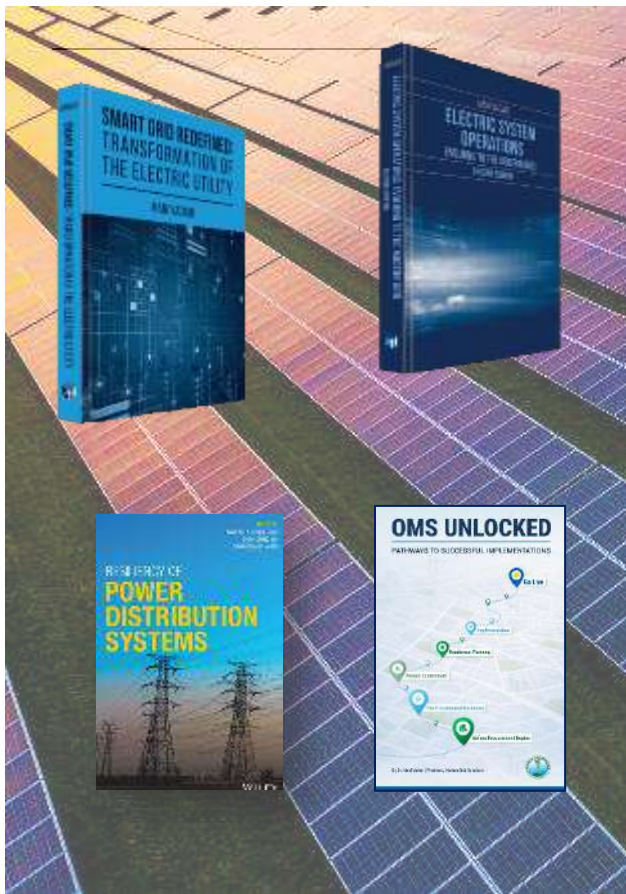
ABOUT MODERN GRID SOLUTIONS

Modern Grid Solutions (MGS) is a global supplier of deep expertise in the electric industry. Our team, each with over 25 years of industry experience, delivers innovative solutions to utilities, corporate clients, and policymakers. Our experts cover a wide range of areas, including engineering, technology, economics, and operations. We're passionate about helping clients navigate the complexities of the modern grid so they can focus on their core business. Our boutique consultancy stands out for its unique value proposition, where seasoned experts treat clients' businesses as their own.

[Read more about MGS.](#)

We focus on delivering value and actionable guidance to our clients, allowing them to flourish in the evolving energy landscape. Our ongoing projects include:

- | | |
|--|---|
| • California Municipal Strategic Modernization Journey Map | • Northwest Utility Transmission Strategic Planning |
| • Energy Service Provider Assistance | • Data Centers - Developers/Operators |
| • Business Architect Role | • Decarbonization Strategy |
| • Vendor Collaboration | • Startup Support |



The guy (literally) wrote the books!

Dr. Vadari's books serve as widely used textbooks in universities across the U.S. and beyond. Personnel at several utilities use them as reference books.

- ***Smart Grid Redefined: Transformation of the Electric Utility***
- ***Electric System Operations – Evolving to the Modern Grid. 2nd edition***
- ***Resiliency of Power Distribution Systems*** - Chapter 14, *Technology and Policy Requirements to Deliver Resiliency to Power System Networks*, by Dr. Mani Vadari, Dr. Gerry Stokes, & John (JD) Hammerly.
- ***OMS Unlocked: Pathways to Successful Implementations*** - The hardback, paperback and eBook are coming soon. Stay tuned for more news on their release.

Additionally, MGS is the trusted authority for conducting in-depth training sessions on critical industry subjects, including power system fundamentals and grid modernization. [Ask us](#) about our training programs.

Don't miss out on our incredible resources!

Head over to our [website](#) and discover our eBook, "[Utility Executive Quick Reference Guide](#)," and Dr. Vadari's Blog, "[Watt's on Mani's Mind?](#)" And that's just the beginning! Explore much more on our website. Visit us and unlock a world of knowledge from our industry leaders.

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