



Oklahoma Interim Study on Grid Resilience

National Electrical Manufacturers
Association (NEMA)

September 23, 2026



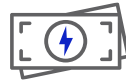


Membership Overview

NEMA represents over 300 electrical manufacturers that make safe, reliable, and efficient products and systems.



300+
Member companies



\$376B
Contributed to the U.S. economy



590,000
American jobs directly provided



1%
of U.S. GDP comes from our members

Built Environment



Grid



Industrial



Mobility



NEMA's Grid Reliability Study

America's energy system faces dramatic changes over next 25 years



Unexpected Growth in Electricity Demand

Electricity demand will grow by **more than 55% by 2050**



Innovative Technologies To Meet Near-Term Demand

Urgent need to invest in technologies to meet coming demand in an all-of-the-above energy ecosystem

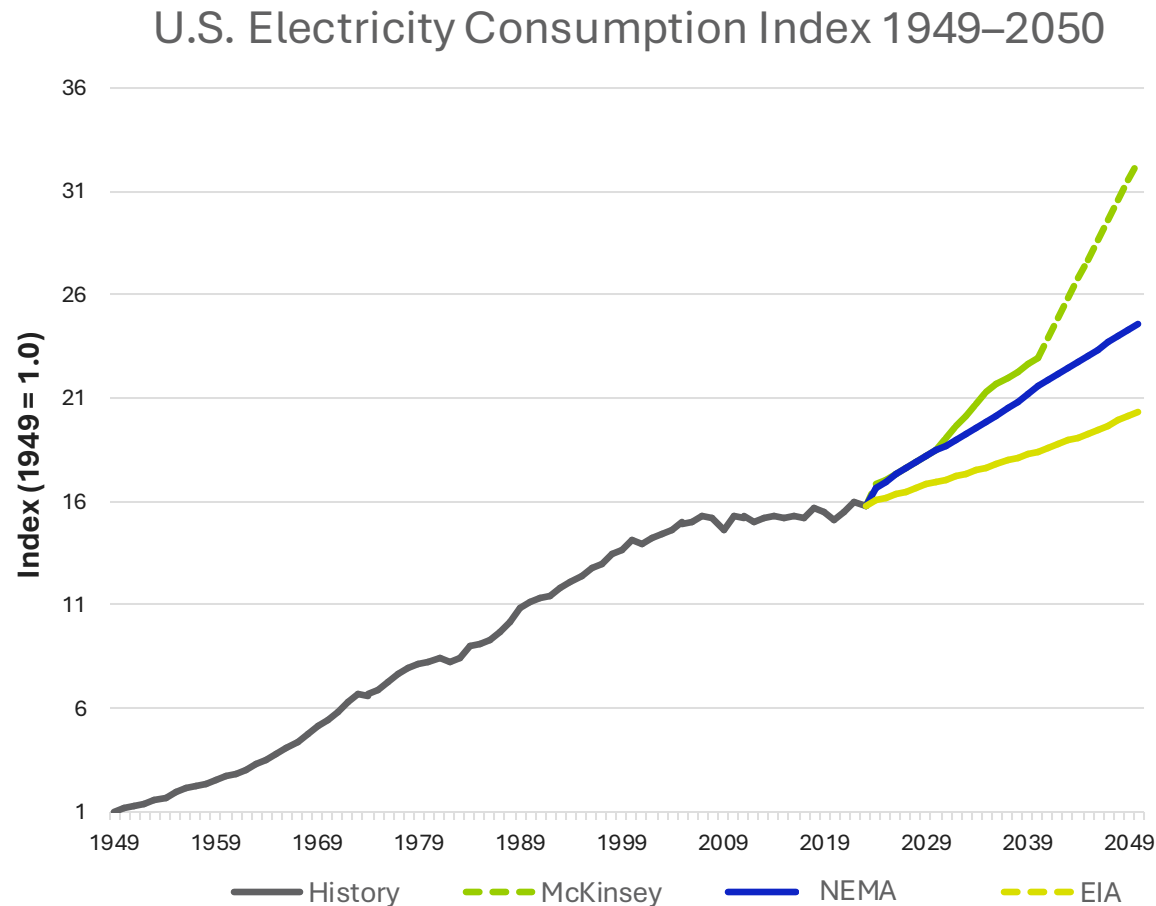


Policy Instruments Must Support America's Energy System

Critical new policies and regulatory certainty needed to deliver a flexible, stable, more resilient grid

Electricity Demand Surges by 55% Through 2050

Data Centers and Transportation Lead the Growth.



Electricity consumption is projected to grow in unprecedented ways

- **300%** projected growth in data center energy consumption over next 10 years
- **9000%** projected growth in E-mobility power consumption through 2050

Regionality in generation and consumption adds complexity

- Mid-Atlantic and Texas will see largest **data center** demand through 2035
- Northeast/West will experience largest demand growth from **EVs** through 2050
- Storage, wind, and solar generation will increase by **300%**
- Renewables will **exceed 50% of generation** capacity in Western U.S., New York, and Southeast

Adoption of new technologies and supporting policies needed to meet demand growth

How to Meet the Moment - What Are Grid-Enhancing Technologies?

GETs, also known as Advanced Transmission Technologies (ATTs), are hardware and software technologies that **increase transmission capacity** and reduce congestion by optimizing how existing lines operate

Dynamic Line Ratings (DLR)

Equipment that calculates how much electricity a line can safely carry in real time

- Line-mounted sensors
- Substation comms equipment
- Protection and control systems



Topology Optimization (TO)

Software that reconfigures flows toward less congested lines by opening or closing circuit breakers

- Circuit breakers and switches
- Substation control systems
- Grid management software

Power Flow Controllers (PFCs)

Hardware that actively controls how much electricity flows on a line to relieve congestion

- Breakers and protection systems
- Power electronics modules
- Substation control equipment

Reconductoring

Replacing existing wires with advanced conductors along an existing corridor

- Advanced high-capacity conductors
- Line hardware and insulation
- Substation terminations

GETs Deliver the Fastest Capacity Uplift at the Lowest Cost

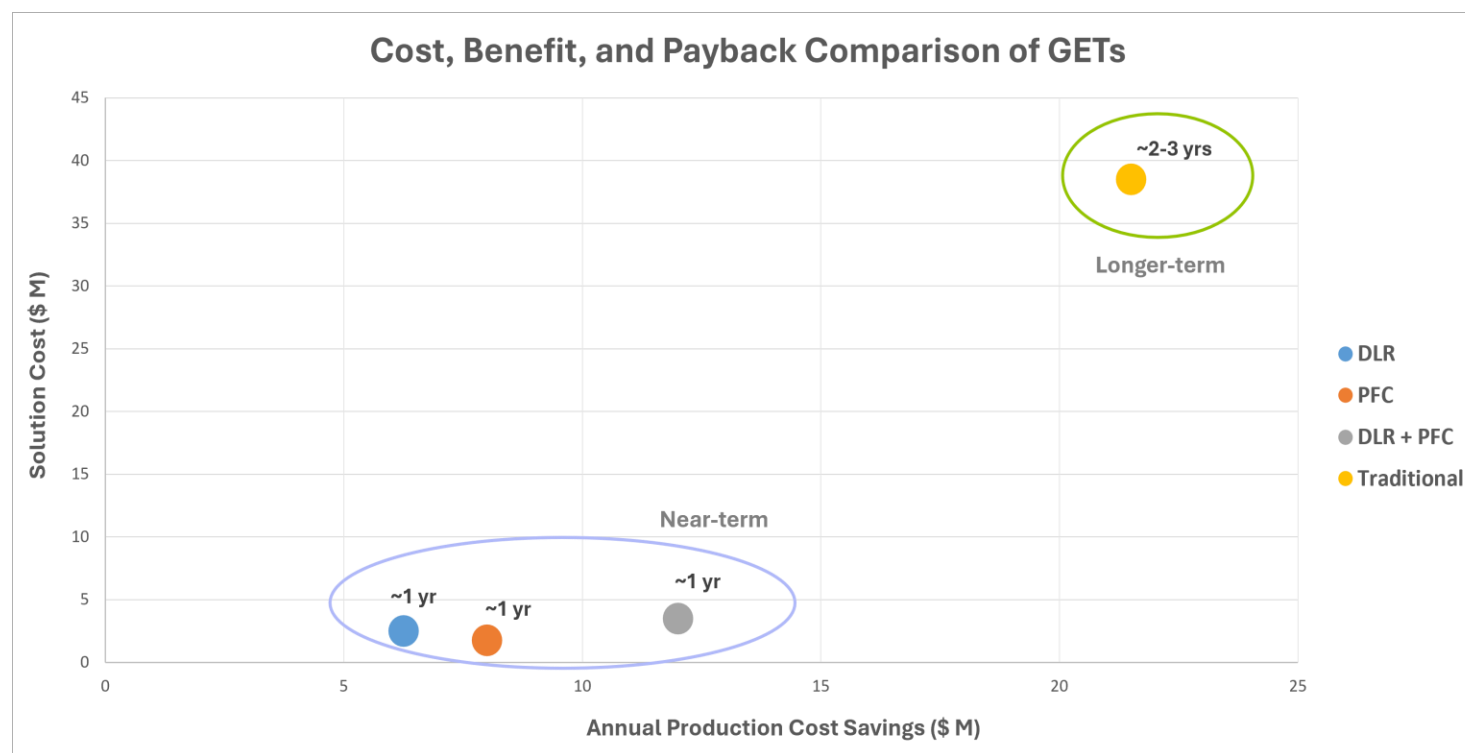
Advanced Transmission Technology	Development Time	Typical Capacity Increase	Permitting Speed	Design Speed	Construction Speed	Cost
GETs including Dynamic Line Ratings	3+ Months 	10-30%				\$
(FACTS) Flexible AC Transmission Systems	8-18 Months 	30-50%				\$\$
Reconductoring w/Advanced Conductors	18-36 Months 	50-110%				\$\$
Greenfield Transmission	5-15 Years 	N/A				\$\$\$\$

Source: [WRI | GridLab](#)

- GETs deploy on near-term timelines**
 Often implemented within months, GETs benefit from faster permitting, design, and construction relative to traditional transmission expansion
- GETs unlock capacity quickly on existing infrastructure**
 GETs provide meaningful incremental capacity where constraints are binding—without waiting for major transmission construction
- GETs deliver benefits at a lower cost**
 GETs are a cost-effective complement to longer-term traditional transmission expansion

GETs Provide Payback in Months While Traditional Transmission Upgrades Take Years

Results from an ISO – New England power system investment analysis



Source: [Idaho National Lab](#)

> GETs deliver payback within roughly one year

Across dynamic line ratings (DLRs), power flow controllers (PFCs), and combined deployments, modeled results show near-term payback driven by system-wide production cost savings that exceed upfront costs

> Traditional transmission upgrades require longer payback periods

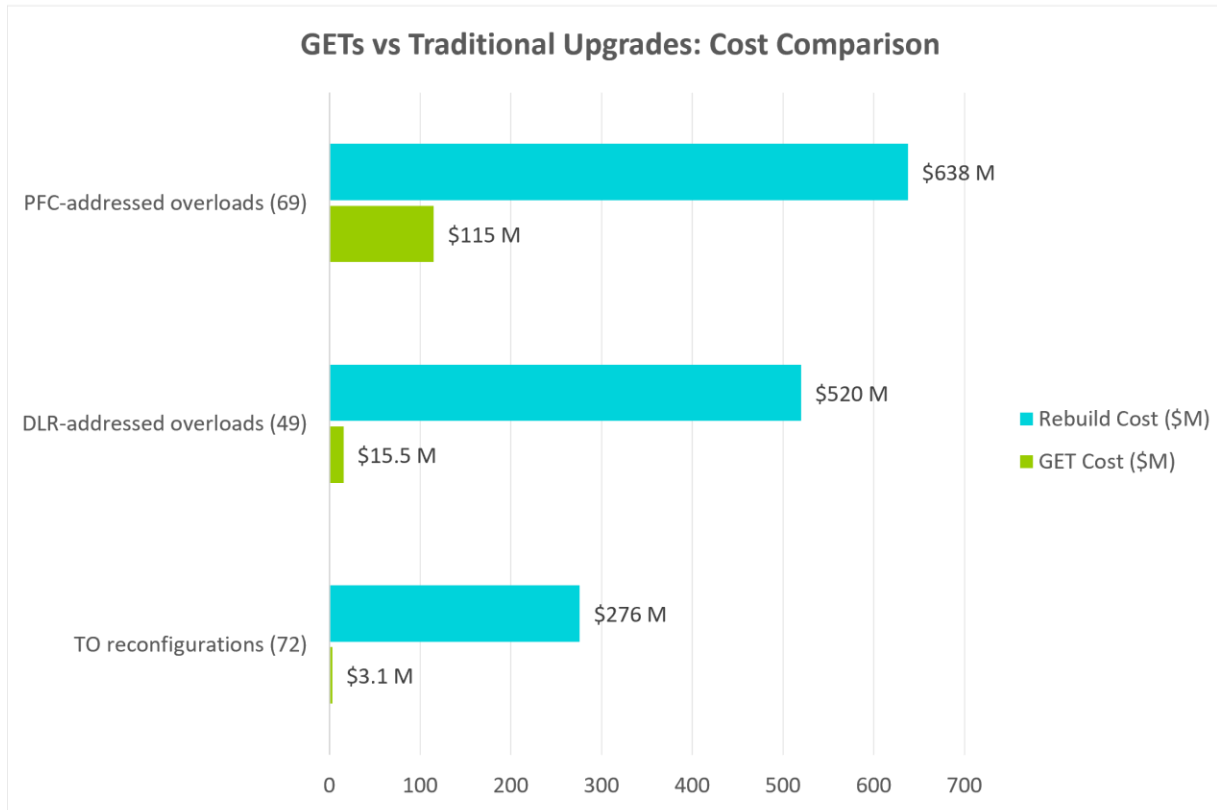
Higher capital costs and longer development timelines result in multi-year payback periods for conventional transmission upgrades

> GETs address near-term constraints while long-term projects advance

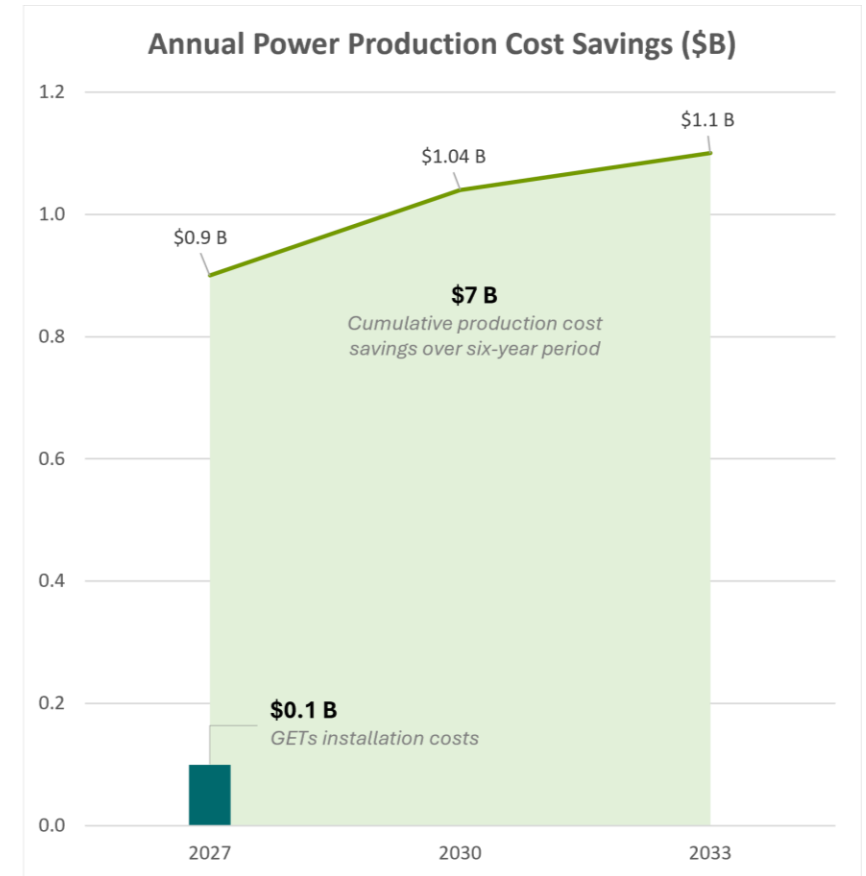
GETs help bridge timing gaps between electricity demand growth and new infrastructure delivery

PJM Modeling Shows GETs Convert Grid Congestion into Usable Capacity While Saving Costs

Source: [Quantam](#) | [RMI](#)



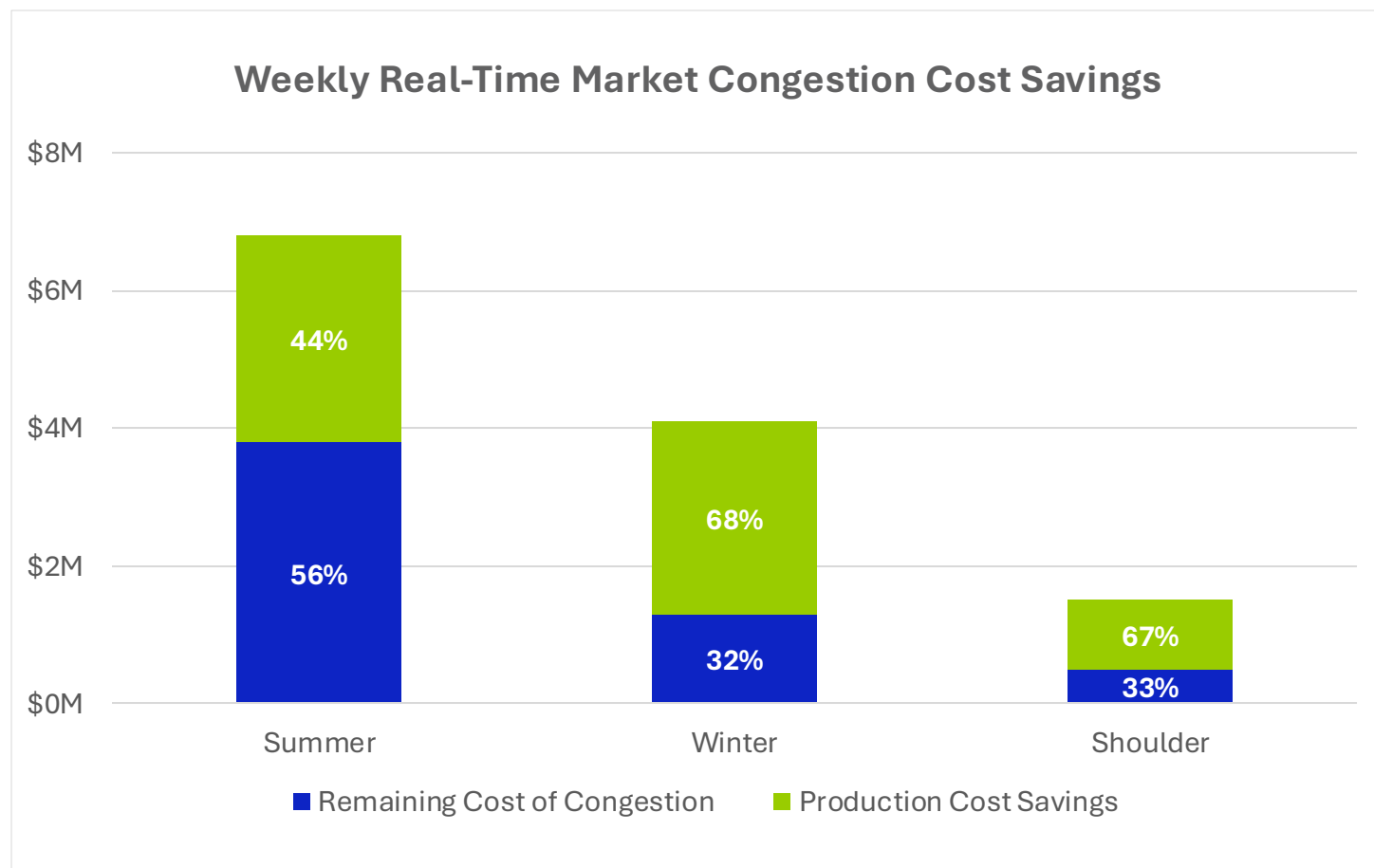
> PJM case study shows **GETs unlock 6 - 7 GW of usable capacity**



> System-wide power production cost savings reach **\$7B over six years**, far exceeding upfront installation costs

Topology Optimization Curbs Real-Time Congestion Costs

Results from a PJM market case study



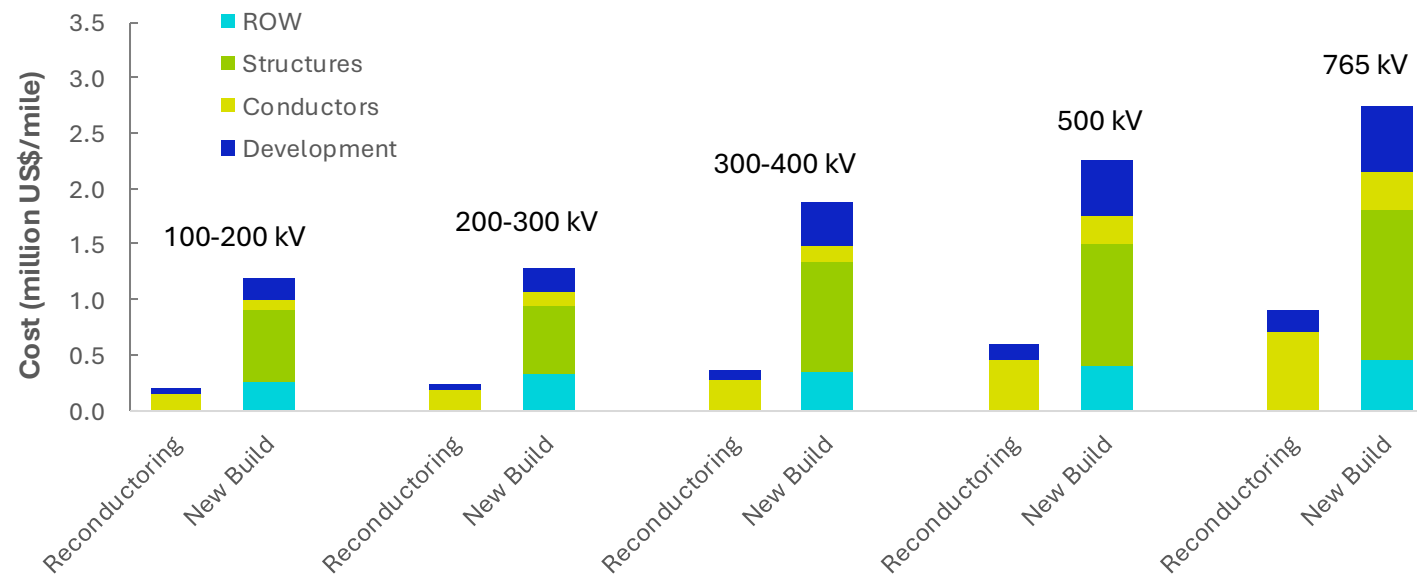
- > **50% reduction in real-time congestion costs**
Topology optimization delivers substantial congestion cost reductions across summer, winter, and shoulder periods, with savings varying by system conditions
- > **Operational changes drive immediate production cost savings**
By reconfiguring existing transmission paths, topology optimization lowers dispatch costs without new infrastructure, delivering savings directly through market operations
- > **Market-scale impact reaches \$100 million annually**
Extrapolating weekly real-time savings suggests topology optimization could deliver on the order of \$100 million per year in power production cost savings for the PJM alone

Source: [Brattle](#)

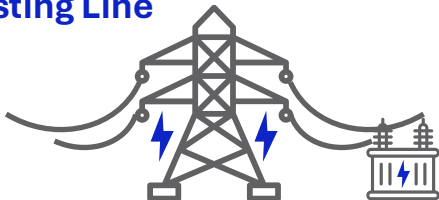
Dollar values approximated from published chart

Advanced Conductoring Can Double Transmission Capacity Using Existing Rights-of-Way (ROW)

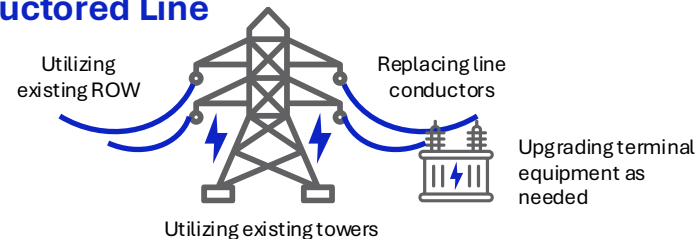
Transmission Line Cost Comparison: Reconductoring vs. New Build



Existing Line



Reconductored Line



> **Reconductoring can double transmission capacity within existing corridors**

Advanced composite-core conductors allow utilities to increase line capacity by up to 2× without building new transmission routes, accelerating expansion while avoiding right-of-way constraints

> **Upgrading existing lines costs millions less per mile than building new transmission**

Across voltage classes, new transmission construction can cost several million dollars per mile, while reconductoring projects are substantially cheaper by reusing existing infrastructure

> **Reusing towers and rights-of-way reduces permitting barriers and build timelines**

Reconductoring uses existing utility towers, corridors, and portions of terminal equipment, limiting environmental review and permitting requirements compared with new transmission builds

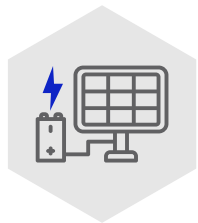
Dynamic Line Rating Adds Capacity And Avoids Downtime While Reconductoring Delivers Larger Capacity Gains Longer Term

		Time to Implement	Downtime	Cost	Est. Capacity Benefit
	Reconductored	2-3 Years	Extended Outages	\$0.5M per mile	+34%
	Rebuild	3-5 Years	Extended Outages	\$2-3M per mile	+106%
	Dynamic Line Rating	~1 Year	No Outages	<\$1M per mile	+10-30%

GETs Translate Fast Grid Relief Into Broad Economic Benefits That Outweigh Costs

Southwest Power Pool (SPP) case study shows rapid payback from GETs deployment

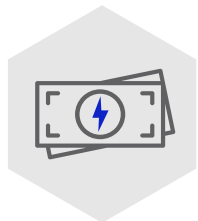
The Benefits of GETs in Kansas and Oklahoma



2x
the energy
capacity



6 Months
to recoup \$90M
investment



\$175M
annual production
cost savings



11,300
direct short-term
jobs

Potential Nationwide Benefits



\$5B+
production cost
savings



10,000+
local construction
jobs + thousands of
long-term jobs

Policy Priorities that Support Faster GETs Deployment

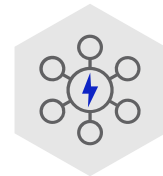
Advance Grid Enhancing Technology Solutions and All-of-the-Above Energy System Solutions

Secure tax and policy approaches that encourage utilities to invest in GETs to bridge the near-term gap between peak power demand and supply.



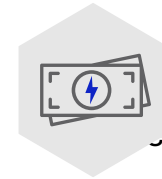
Incorporate GETs into transmission planning and interconnection processes

Evaluate GETs alongside traditional transmission upgrades in regional planning and interconnection studies to ensure lower-cost, faster-to-deploy solutions are considered alongside major infrastructure expansions.



Enable cost recovery and performance incentives for grid optimization investments

Regulatory frameworks should allow GETs investments in the rate base with performance-based incentives tied to congestion reduction, capacity gains, and system cost savings to accelerate adoption



Require transparent evaluation of GETs in grid planning decisions

Planning authorities should evaluate GETs as part of transmission planning and upgrade proposals so grid operators can identify the most cost-effective combination of operational technologies and infrastructure investments



What can YOU DO as State Legislators

Financial

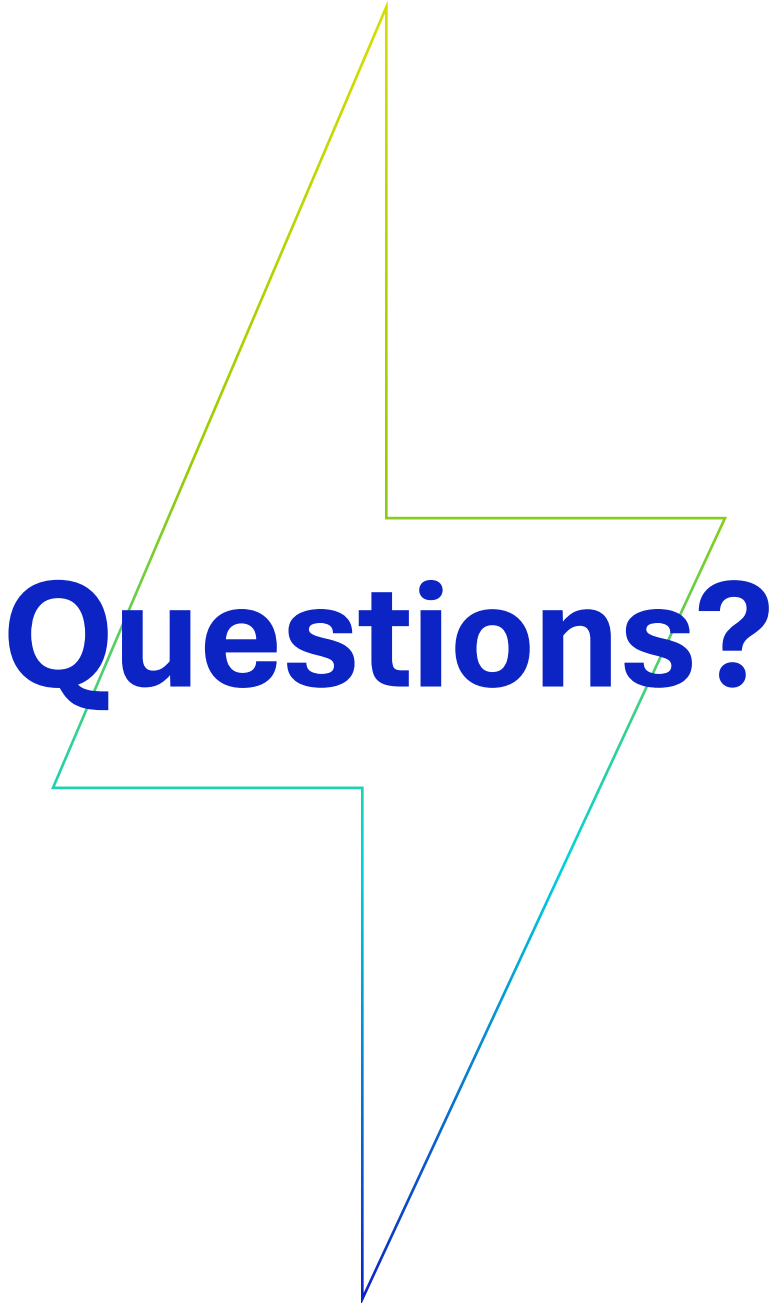
- Advanced Manufacturing tax credits
- Capital Investment Incentives
- Incentivize in-state production of electrical steel, conductors, transformers
- P3s Private Public Partnerships
- Stable multi-year incentive structures
- Workforce training tax credits

Permitting & Regulatory

- Streamline Permitting
- Co-Location –Next Gen Highway Coalition
- Accelerate permitting and siting approvals
- Incentivize industrial site readiness programs
- Designate critical equipment freight corridors
- Establish regional reciprocity agreements for transport permits

Workforce & Domestic Content

- Fund technical and apprenticeship programs
- Align education with industry-defined skills and needs
- Flexibility and waivers if compliant products unavailable
- Standardize state-level interpretation of BABA
- Clear guidance and certification pathways



Questions?