



OpenMinds

NextGen Grid United Team:  
**Final Project Deliverable**



# NextGen Grid United Team



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# Executive Summary

- Current **U.S. transmission growth (~1% per year) is insufficient** to support decarbonization and rising electricity demand
- Data centers, electric vehicles, and AI-intensive industries are **pushing electricity demand to unprecedented levels**, elevating the need for a robust electricity grid
- Fragmented state-by-state permitting, lengthy environmental reviews, and complex cost allocation mechanisms **impede transmission projects** and drive up investor risk
- **Streamlined processes could reduce project timelines**, lower investor uncertainty, and attract more private capital, strengthening the grid while fostering large-scale renewable integration
- The bipartisan Energy Permitting Reform Act (EPRA) did not advance due to political challenges, but **key provisions could be adapted or revived in shifting political climates**
- Merchant transmission developers can **capitalize on new opportunities amid permitting reform if prepared**, through proactive route identification, advisory services, strategic partnerships, and potentially acquiring smaller utilities
- Organizations that **position themselves for both existing frameworks and future policy changes** will remain agile and best placed to seize emerging transmission development opportunities

# Transmission development shows how the Dual Challenge will require coordinated efforts across business, policy, and tech

- Accelerating transmission development is an **essential step to tackling the Dual Challenge** and ensuring energy reliability in the US
- Progress requires coordinated efforts across policy, technology, and business, and OpenMinds is well-equipped to **facilitate this cross-functional collaboration**, across:
  - **Policy:** Permitting reforms are needed to unlock greater pace of development
  - **Technology:** Advanced grid solutions, including enhanced transmission and storage, are essential to modernize the grid
  - **Business:** Merchant Transmission Developers (MTDs), like Grid United, play an key role in constructing much-needed interregional transmission

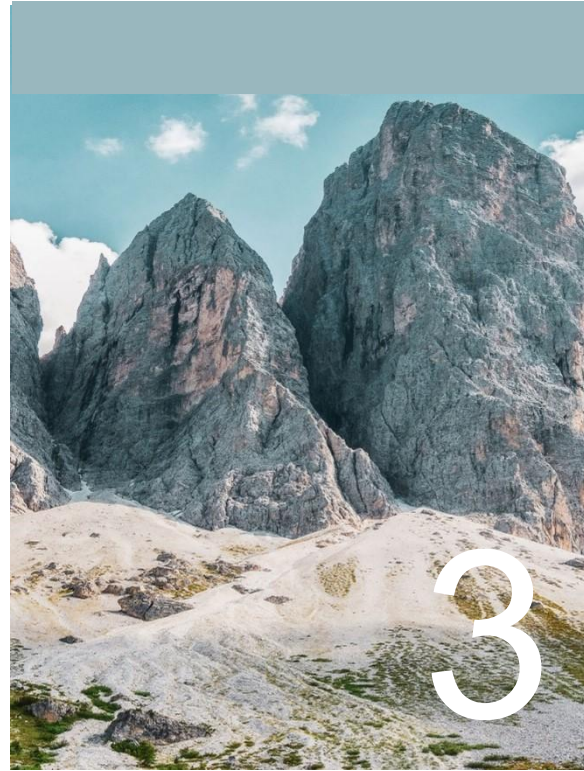




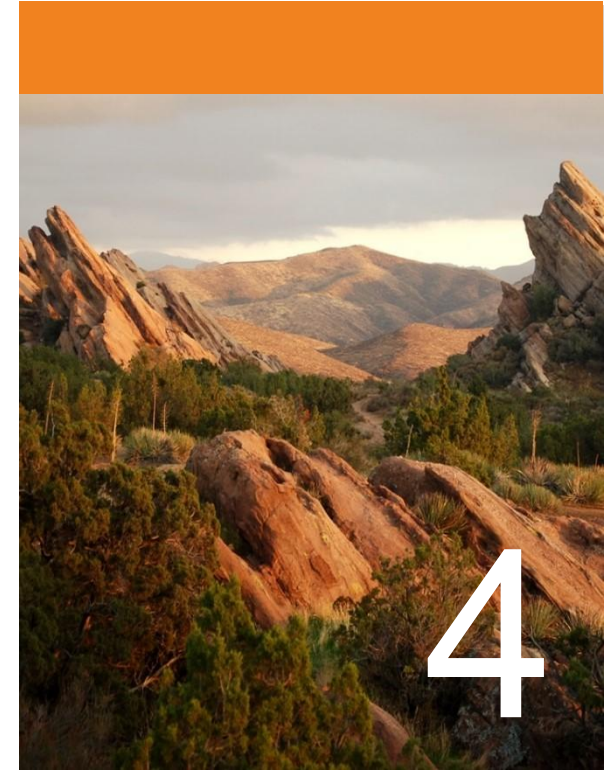
## The Need for Transmission Development



## The World Today



## The Case for Permitting Reform



## Merchant Transmission in the new Environment

1

# Accelerating transmission development is a strategic imperative to ensure grid reliability, reduce emissions, and lower costs

The U.S. transmission system is **aging and struggling to keep pace** with the evolving demands of the 21st-century energy landscape

To meet just the IRA's targets, the rate of transmission expansion must **more than double**, reaching an average of 2.3% per year—significantly higher than the historical average of ~1% per year

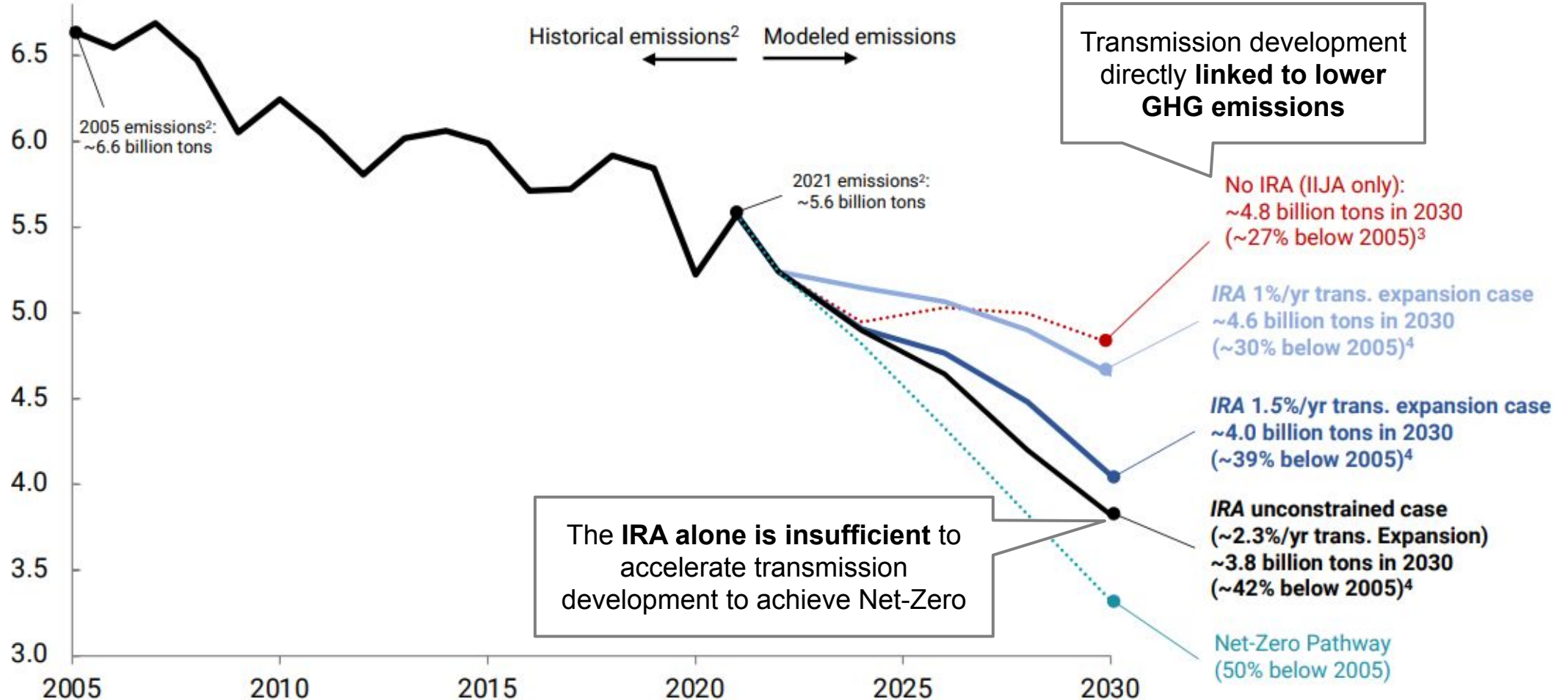
Typical duration from an interconnection request to commercial operation was **5 years in 2022**, compared with 3 years in 2015 and less than 2 years in 2008



**Delays in transmission development slow expansion of renewable energy installations and lead to increased carbon emissions**

# Net-zero carbon emissions cannot be achieved without significantly accelerating transmission development

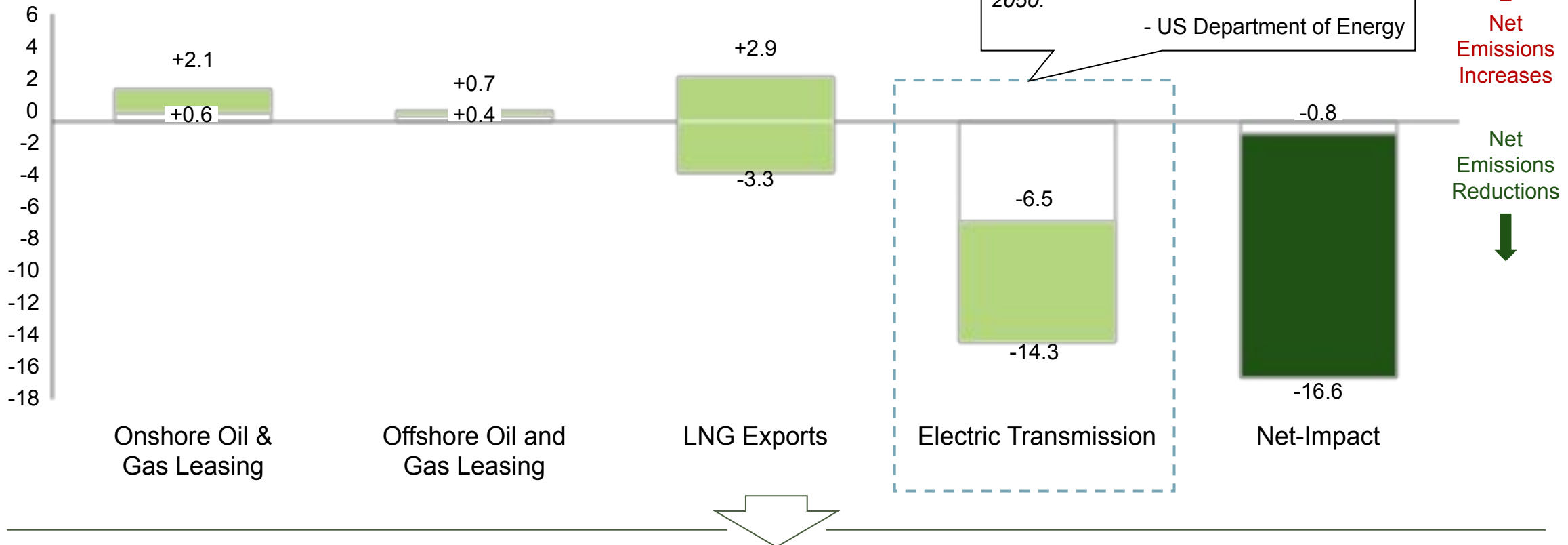
**Impact of Transmission Expansion Constraints on Modeled Net U.S. Greenhouse Gas Emissions**  
billion metric tons CO<sub>2</sub>-equivalent (Gt CO<sub>2</sub>-e)



Source: Princeton University Zero Lab, REPEAT Project Report on IRA Transmission Needs; US Energy Information Administration

# Net impact of current permitting reform efforts yield significant reductions in carbon emissions

Ranged emissions impacts of EPRA provisions by 2050, (GtCO<sub>2</sub>e)



While permitting reform proposals similar to EPRA could facilitate oil and gas leasing and LNG exports, there is still a strong net reduction in emissions caused by development of electric transmission

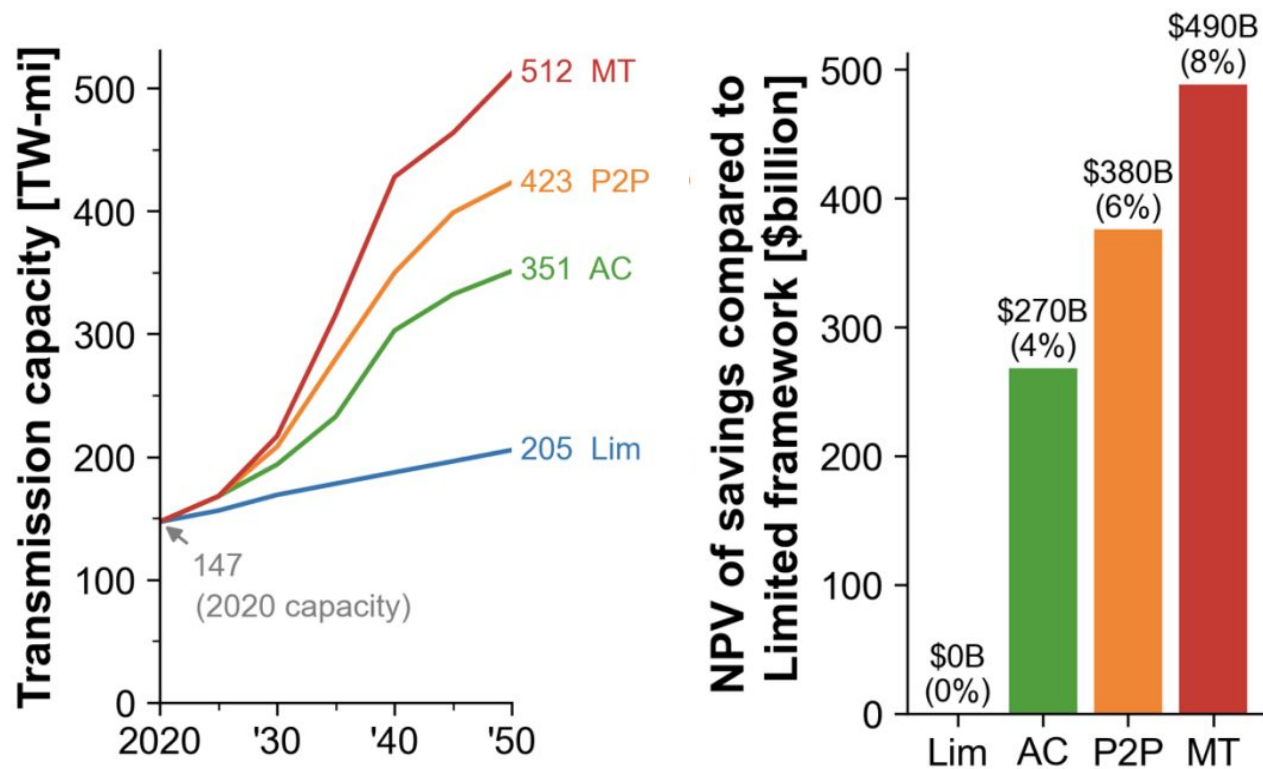
Source: Third Way *Emissions Impact of Energy Permitting Reform Act of 2024*; DOE *National Transmission Study Executive Summary*



# DOE analysis confirms that interregional transmission development decreases costs and increases grid resilience

- Increased transmission capacity shifts energy sources toward cheap renewables, resulting in up to **~\$490B in net present value savings**
- Interregional transmission development **significantly decreases stress on grid infrastructure**, lowering OPEX and strengthening resiliency

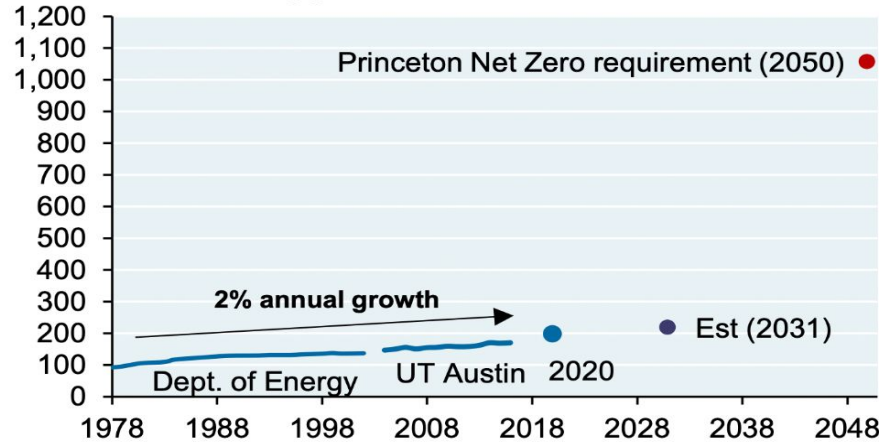
Increased transmission capacity linked to savings from cheaper energy sources and greater resilience



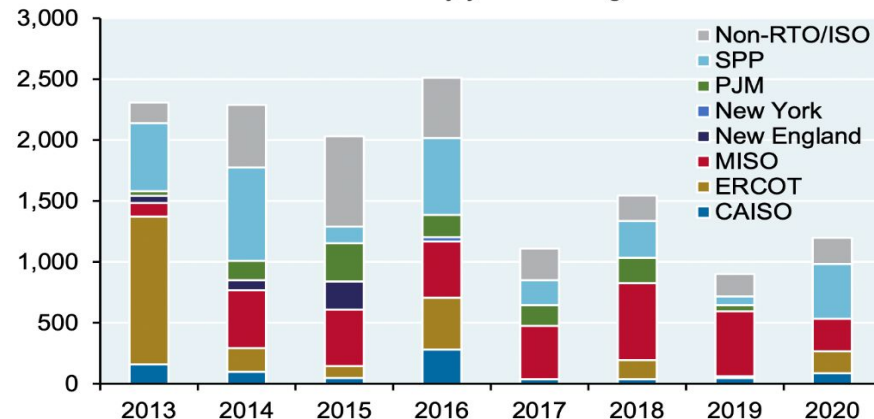
# 2

## The pace of transmission expansion has declined dramatically over recent decades

**US transmission grid growing at just 2% per year since 1978**, Thousands of gigawatt-miles



**Most recent growth has been just 1% per year**  
Miles of transmission lines added by year and region



Transmission expansion has fallen from an **annual growth rate of 3.3% between 1978-1982** to approximately **1% per year in the past decade**

Energy demand continues to grow at unprecedented rates with **130 new data centers coming online in 2024**

Current projections indicate that data center electricity consumption will increase from 4.4% of total U.S. usage in 2023 to **between 6% and 12% by 2028**

Source: Michael Cembalest, JP Morgan Asset Management 2022 Eye on the Market Energy Paper; DOE, UT Austin, "Net Zero America", S&P Global; 2024 United States Data Center Energy Usage Report

# 2

## Utilities have not been historically incentivized to develop interregional transmission

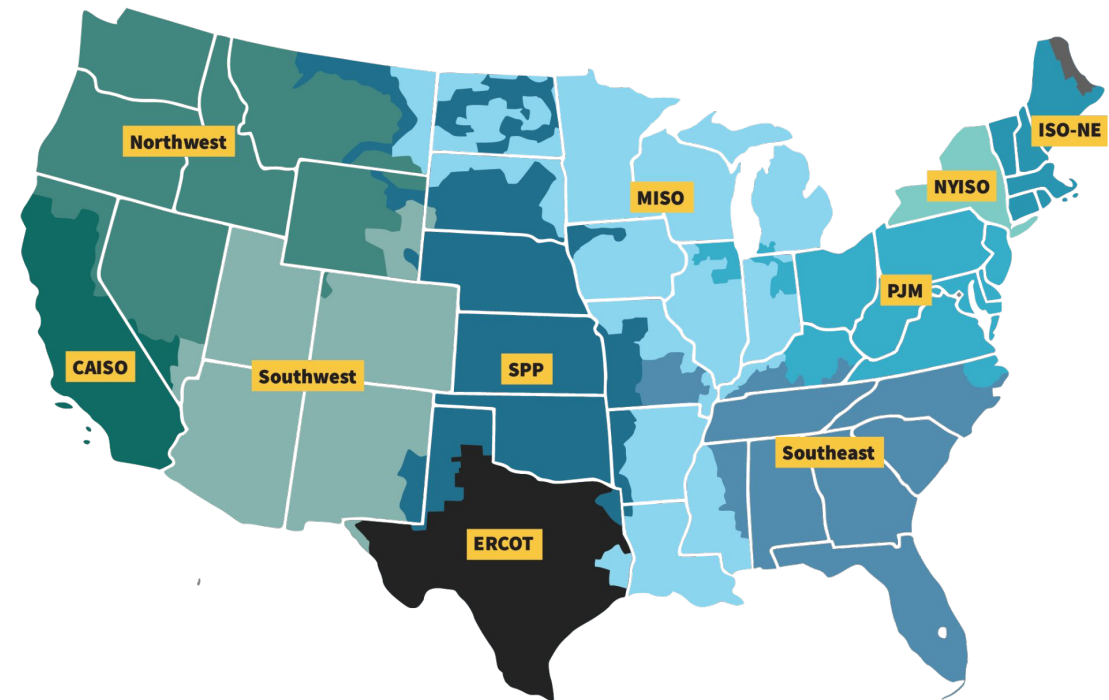
### Cost Allocation

Development, ownership, and usage rights are unclear across state and RTO/ISO boundaries

### Permitting

State permitting processes differs and are further complicated by ever increasing federal requirements.

*Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs) boundaries in the US*

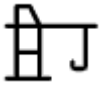
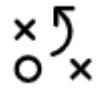




 Utilities are usually focused on their service territories and have largely divested from the human capital needed to develop transmission

Source: FERC. *RTOs and ISOs*. <https://www.ferc.gov/power-sales-and-markets/rtos-and-isos>.

# 3

## Reforms efforts aim to address four key obstacles to accelerate transmission development

Current State		Potential Future State
 <b>Applicant-Driven Permitting</b>	Transmission developers <b>could not directly apply</b> for a construction permit from FERC	Developers can <b>apply directly to FERC</b> for construction permits
 <b>Cost Allocation</b>	Limitations on <b>which rate payers can be allocated costs</b> of interregional transmission	Applicant-driven projects can <b>allocate costs based on all beneficiaries</b>
 <b>Require Interregional Planning</b>	Interregional transmission planning <b>not sufficiently incentivized</b> so it was rarely done	<b>Require interregional planning</b> with all projects utilizing a common set of input assumptions and models
 <b>Expand FERC Siting Authority</b>	FERC backstop siting authority only for projects <b>designated national interest electric trans. corr. (NIETC)</b> by DOE	Expanded FERC backstop siting authority to <b>all projects that are "in the national interest"</b>

Source: Grid Strategies and Senate Committee on Energy and Natural Resources

<https://openminds203x.org/>

# 3

## The future of permitting reform is uncertain amid the current political climate but current admin priorities may be aligned

### The EPRA will not go forward as written

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- The EPRA was not included in the final spending package of 2024, leaving the **future of permitting reform uncertain**
- The deregulatory agenda of the Trump administration **could favor permitting reform**

### Contentious elements of EPRA could be revised in the next efforts at permitting reform

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- Maintain the application-driven process while **adjusting or removing controversial cost allocation provisions**
- **Streamline state-level permitting processes** for MTDs, particularly regarding Certificates of Public Convenience and Necessity (CPCN)
- Create pathways for **developers to seek federal backstop authority** while directing transmission developers to secure rights-of-way through voluntary transactions and community benefit agreements

# 4

## Merchant Transmission Developers solve for the expertise, ability to deploy capital, and risk appetite to build transmission

**Merchant Transmission Developers (MTDs)** are independent, non-utility entities that develop, own, and operate transmission lines or projects, typically without relying on traditional cost-of-service regulation.

MTDs **recover costs by charging market-based rates to users** of their infrastructure, such as power generators or electricity buyers.

### Today

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Merchant transmission developers operate in a fragmented regulatory and market environment with **lengthy project timelines, high financial risk, and limited interregional collaboration**, limiting their ability to develop transmission at the required pace



### Tomorrow

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With sweeping permitting reform, MTDs can leverage streamlined approval processes, reduced risk profiles, and expanded partnerships to **rapidly build critical grid infrastructure and meet rising demand**

# 4

## Merchant Transmission Developers can prepare themselves for ‘day one’ of new paradigm under permitting reform

1. Consider where policy change could **create or reveal newly “low-hanging fruit:”** transmission development opportunities made more feasible after reform
2. Prepare for increased competition by **proactively developing relationships for high-opportunity lines**
3. Consider **advisory practice** as a means to build relationships and market intelligence
4. Search the landscape for the “super-users” who could be **strategic partners in development**
5. With a changing risk profile, consider the merits of **expanding firm’s investor base**
6. Consider **acquisition of a strategic utility** to enable differentiated development purview
7. Stay vigilant of **anticipated industry changes** as they arise to mitigate future risks and take advantage of future opportunities



## Appendix

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# The Energy Permitting Reform Act (EPRA) of 2024 addressed many of the obstacles inhibiting transmission development

## Improved FERC permitting authority

- **Simplifies backstop authority of FERC** to permit interregional transmission projects, effectively **saving 2-5 years** in the approval process

## Cost allocation standardization

- **Standardizes defined transmission benefits** to consistently and fairly allocate costs
- **Aligns cost allocation** so that customers pay in proportion to received benefits

## Exclusions for certain transmission activities

- Enables **categorical exclusions from the DOI and USDA** for the following activities:
  - Building transmission facilities within right-of-way (ROW) areas, upgrades to transmission and infrastructure within ROWs, deployment of energy storage technologies on previously disturbed lands

## Interregional transmission planning

- Requires **joint planning for interregional transmission** construction with common assumptions, establishing a mechanism for FERC to resolve disputes

## Judicial review

- **Reduces deadline to file lawsuits** against an agency to reduce project uncertainty
- Limits agency time to act on a remand and requires courts to **prioritize cases on permitting decisions for energy** or mineral projects

Source: Bipartisan Policy Center

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# A

# Transmission development scenarios demonstrate resulting renewable energy production and reduced grid strain

## DOE study transmission expansion scenarios

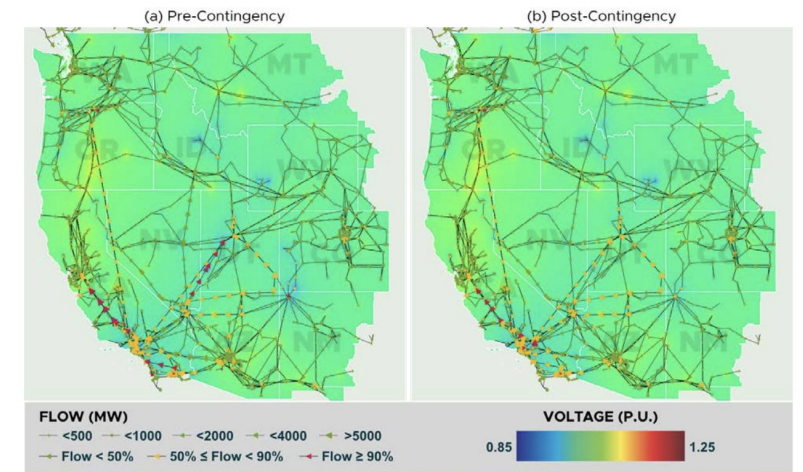
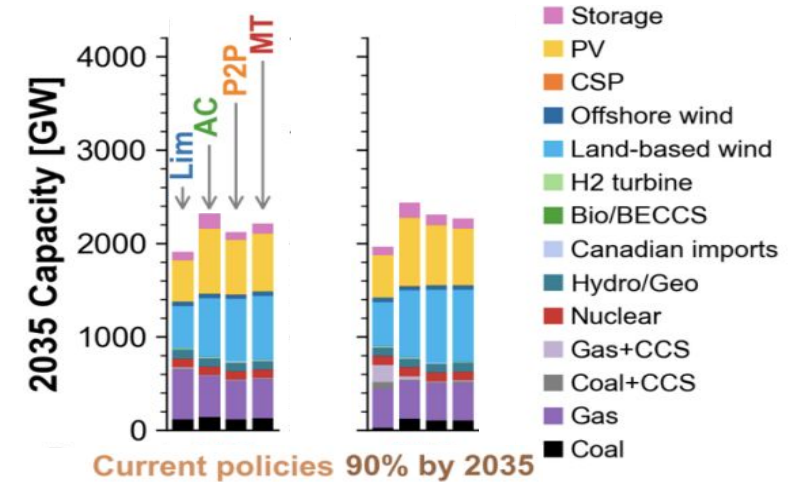
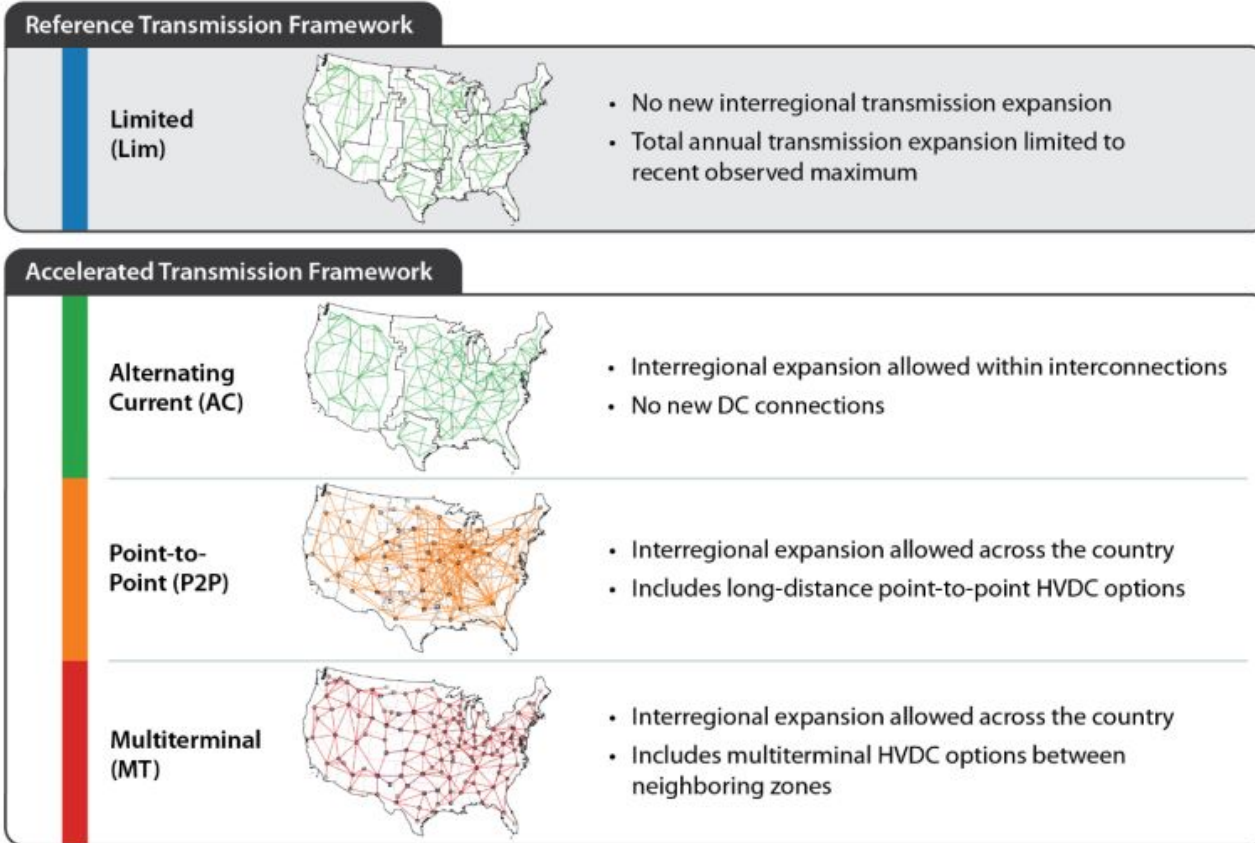


Figure ES-8. Voltage heatmaps (a) pre- and (b) post-contingency for the loss of 2600 megawatts (MW) of generation at a nuclear power plant for the AC scenario: No significant voltage changes following the contingency

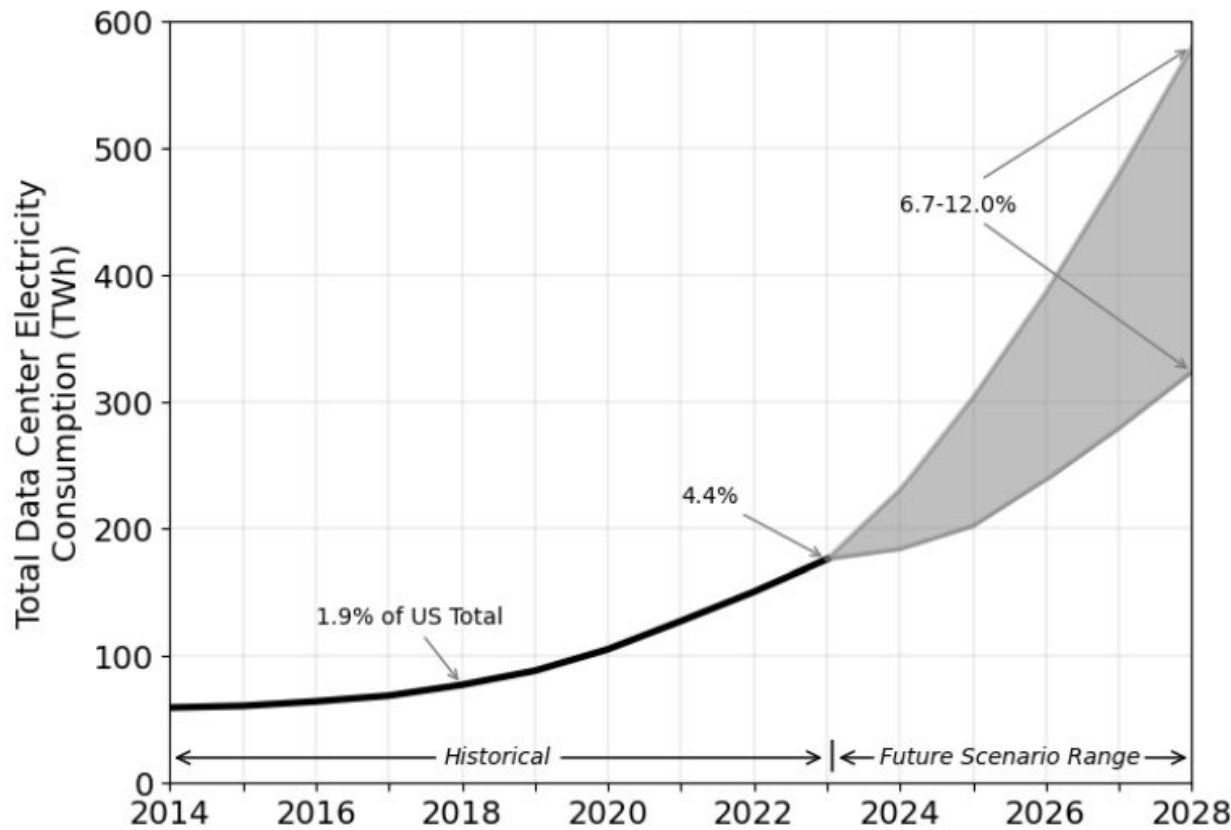
Source: DOE, *National Transmission Planning Study Chapter 2: Long-Term U.S. Transmission Planning Scenarios*

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# A

## Data centers will begin to comprise a larger share of US energy consumption

### Total US data center electricity use from 2014 to 2028



U.S. data center annual energy use remained **stable between 2014 and 2016** at about 60 TWh, continuing a minimal growth trend observed since about 2010

In 2017, the overall server installed base started growing and **GPU-accelerated servers for AI** became a significant enough portion of the data center server stock that total data center electricity use **began to increase again**



**OpenMinds**

**Solving for the  
Dual Challenge.**