



Department of Energy's Draft National Transmission Needs Study

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April 18, 2023



Webinar Notice

- ▶ None of the information presented herein is legally binding.
- ▶ The content included in this presentation is intended for informational purposes only relating to the Draft 2023 National Transmission Needs Study.
- ▶ Any content within this presentation that appears discrepant from the Needs Study language is superseded by the Needs Study language.

Understanding the Needs Study

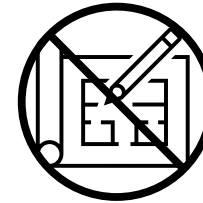
What It Is

What It Isn't

Objective



Assessment of Needs

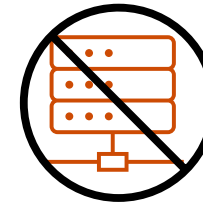


Not prescribing solutions

Methods



Considers published data and reports (80 references)



No new modeling, cost-benefit analysis, or system planning

Output



Needs organized by geographic regions



Regions not synonymous with corridors

National Transmission Needs Study

Executive Summary

- I. Introduction
- II. Legislative Language
- III. Transmission Concepts
- IV. Historical Data: Current Need**
- V. Review of Existing Studies: Current and Future Needs
- VI. Capacity Expansion Modeling: Anticipated Future Need**

<https://www.energy.gov/gdo/national-transmission-needs-study>



IV. Historical Data: Current Need

IV.a. Historical Transmission Investments

IV.b. Market Price Differentials

IV.b.1. Regional Price Differentials

IV.b.2. Interregional Price Differentials

IV.b.3. Transmission Value during Extreme Events

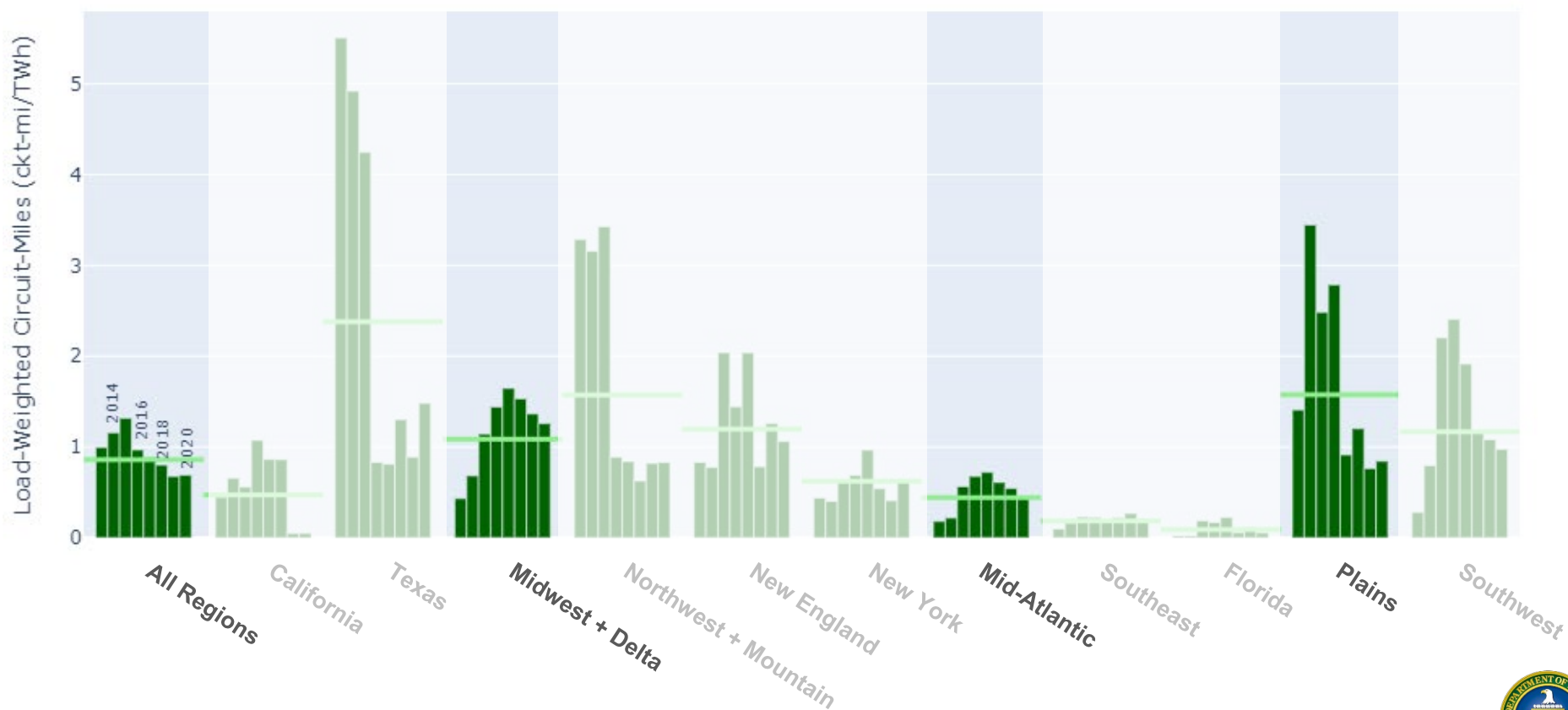
IV.c. Qualified Paths

IV.d. Interconnection Queues



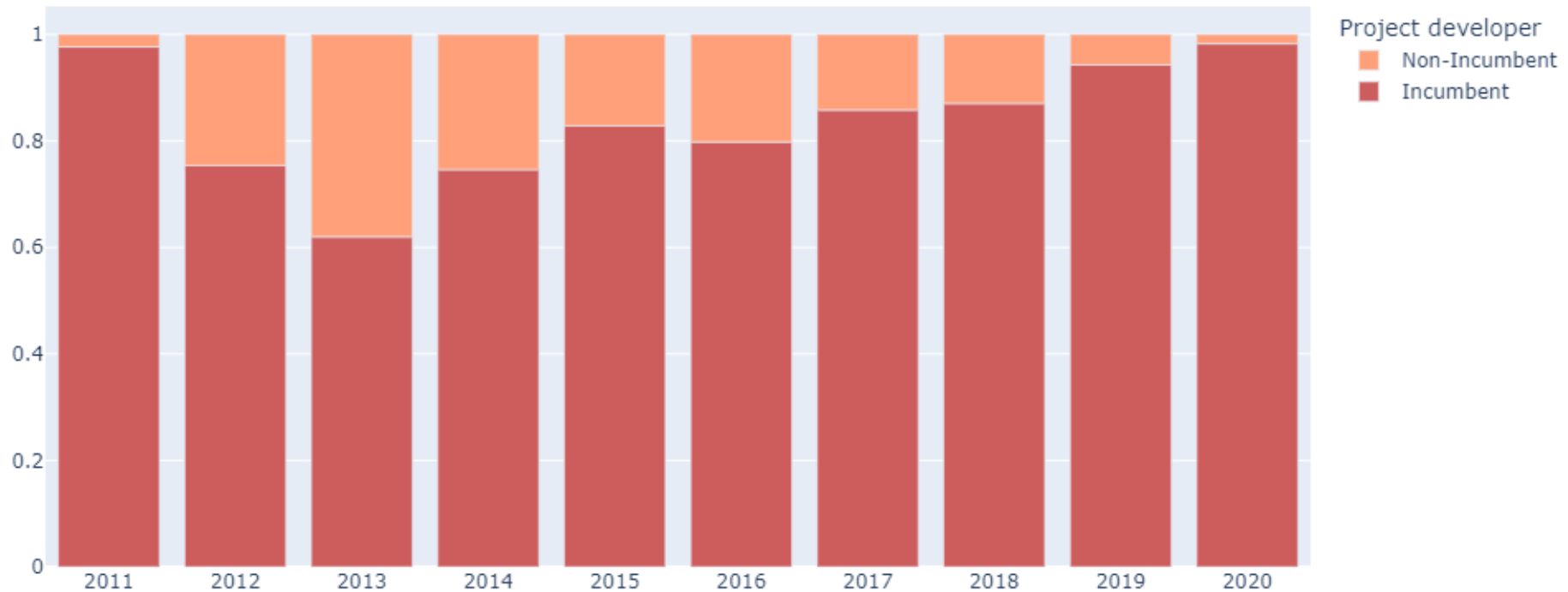
Transmission investments decreased during the second half of the 2010's.

Rolling 3-yr Average Load-Weighted Circuit-Miles, 2013-2020



Non-incumbent developers' share of energized projects has decreased from 40% in 2013 to less than 5% in 2020.

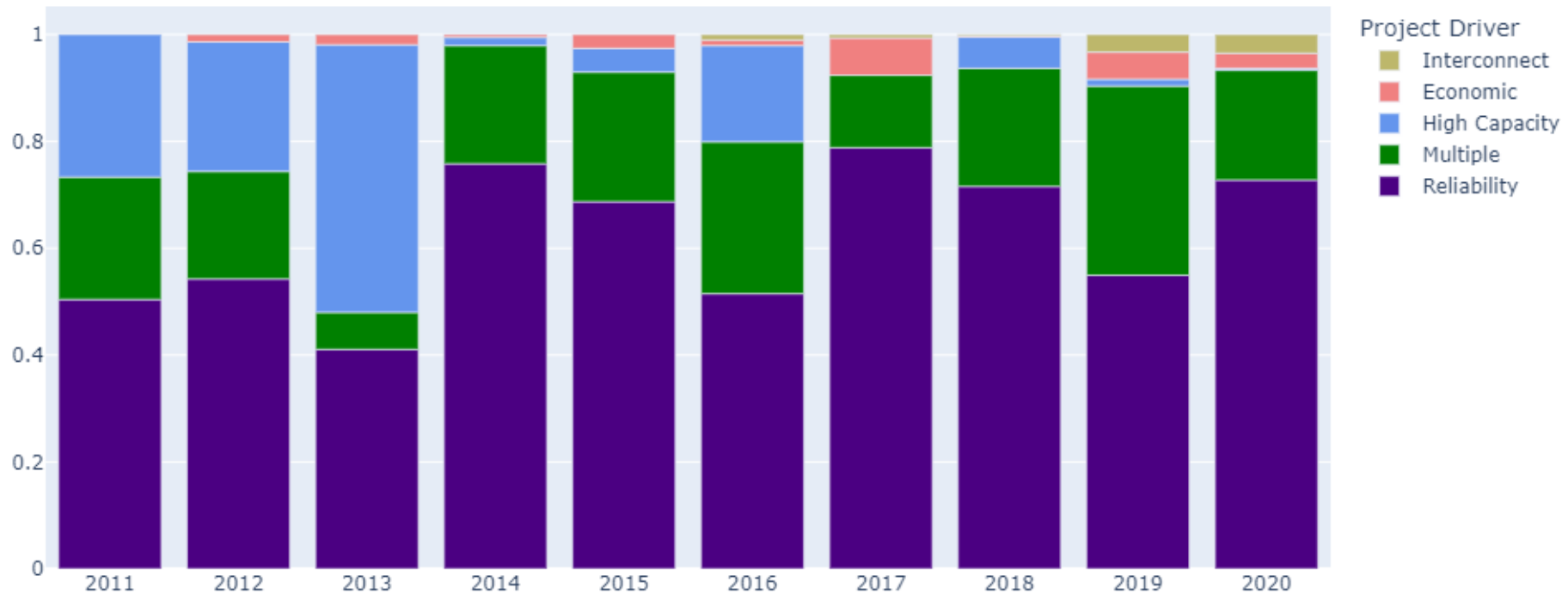
Proportion of national circuit-miles installed each year by developer type



Data from MAPSearch Transmission Database (2020). All transmission lines rated at or above 100kV.

Share of projects addressing reliability concerns have increased. Share of high-capacity projects moving generation have decreased.

Proportion of national circuit-miles installed each year by project driver



Data from MAPSearch Transmission Database (2020). All transmission lines rated at or above 100kV.

Interconnect projects are designed to connect power plants to grid.

Economic projects are designed to alleviate congestion causing high electricity prices.

High-capacity projects are designed to bring large amounts of generation far distances, usually at voltages ≥ 345 kV.

Reliability projects are meant to address a reliability concern on the grid.

Multiple drivers are for projects designed for at least two of the above drivers.

VI. Capacity Expansion Modeling: Anticipated Future Need

VI.a. Included Studies and Scenarios

VI.b. Within Region Transmission Deployment


VI.c. Interregional Transfer Capacity

VI.d. International Transfers



Data from 6 capacity expansion studies are analyzed to identify future regional and interregional transmission needs.

National Lab Reports




2021 Standard Scenarios Report: A U.S. Electricity Sector Outlook

Primary Authors: Wesley Cole and J. Vincent Carag

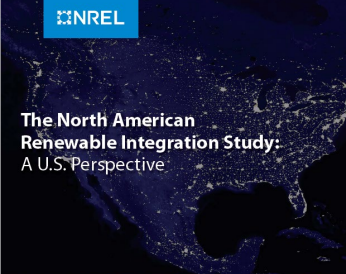
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Solar Futures STUDY

SEPTEMBER 2021



The North American Renewable Integration Study: A U.S. Perspective



Examining Supply-Side Options to Achieve 100% Clean Electricity by 2035

Academic Reports


Princeton's Net-Zero America study
Annex F: Integrated Transmission Line Mapping and Costing

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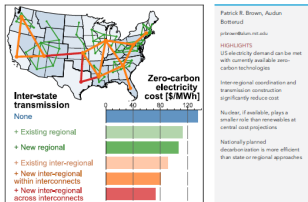
With contributions from
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01 August 2021



Joule | eCIPress

Article
The Value of Inter-Regional Coordination and Transmission in Decarbonizing the US Electricity System



Inter-state transmission cost (\$/MWh)

- None
- + Existing regional
- + New regional
- + Existing inter-regional
- + New inter-regional within interconnects
- + New inter-regional across interconnects

Zero-carbon electricity cost (\$/MWh)

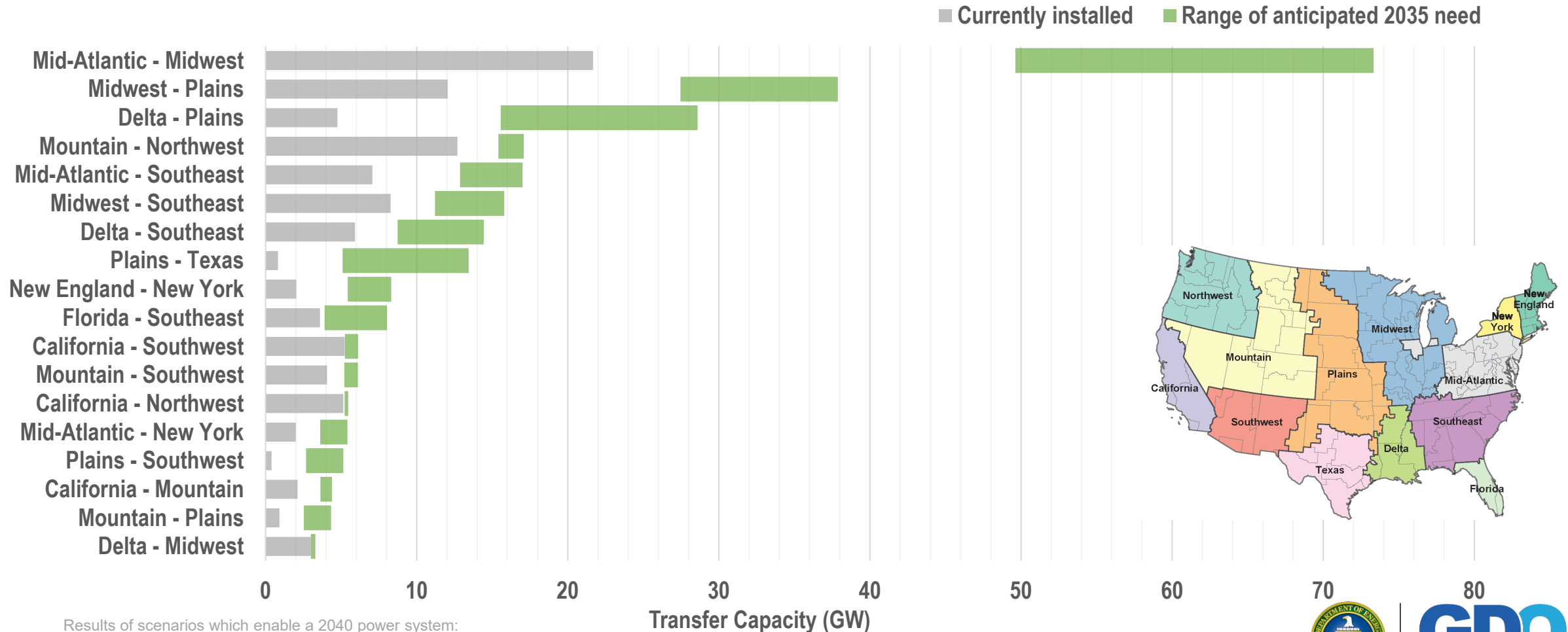
Nationwide decarbonization is more efficient than state or regional approaches.

Capacity expansion models optimize for least cost power sector solutions nation-wide given a range of input assumptions.

Model results help identify quantities of cost-effective transmission solutions and are used here as a proxy for future need to meet generation and demand growth.



Interregional Transfer Capacity Expansion Results: 2035 Mod/High

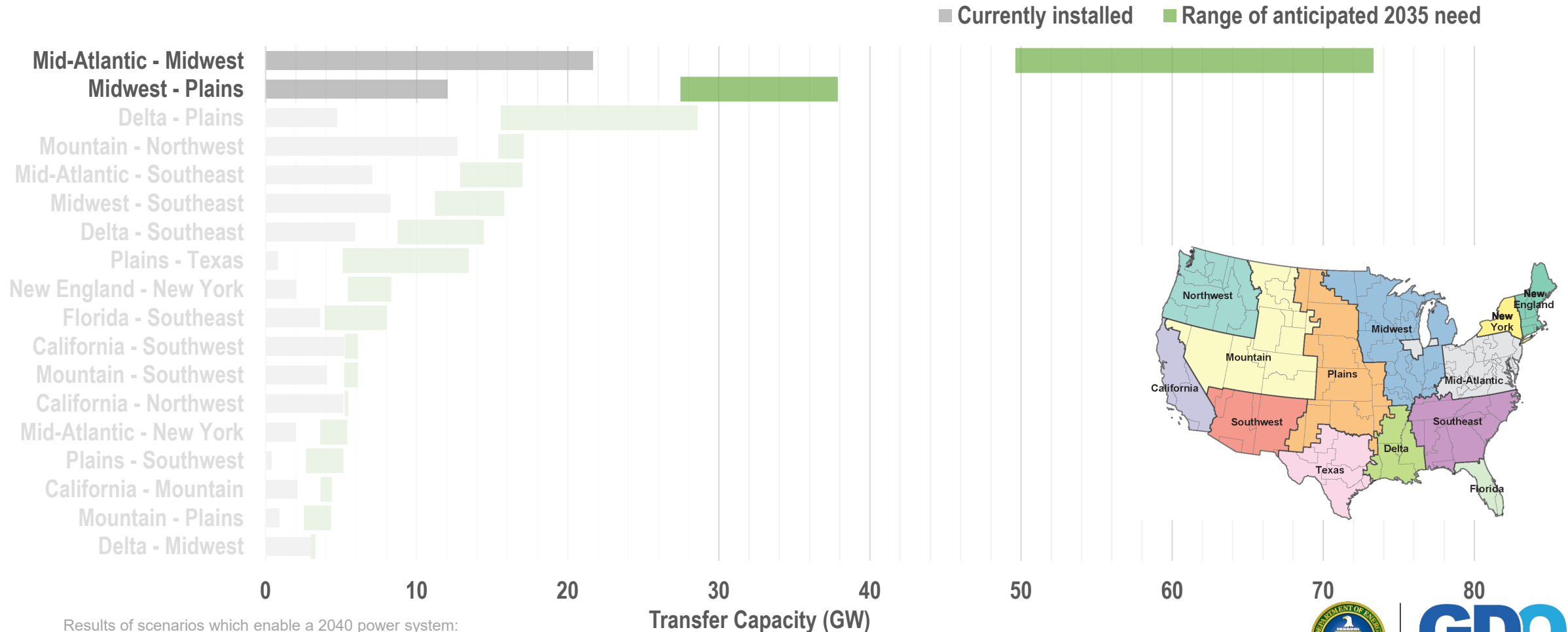


Results of scenarios which enable a 2040 power system:

- 80% - 100% clean energy deployment
- 25% - 75% load growth
- 95 - 100% decarbonization from 2005 levels



Interregional Transfer Capacity Expansion Results: 2035 Mod/High

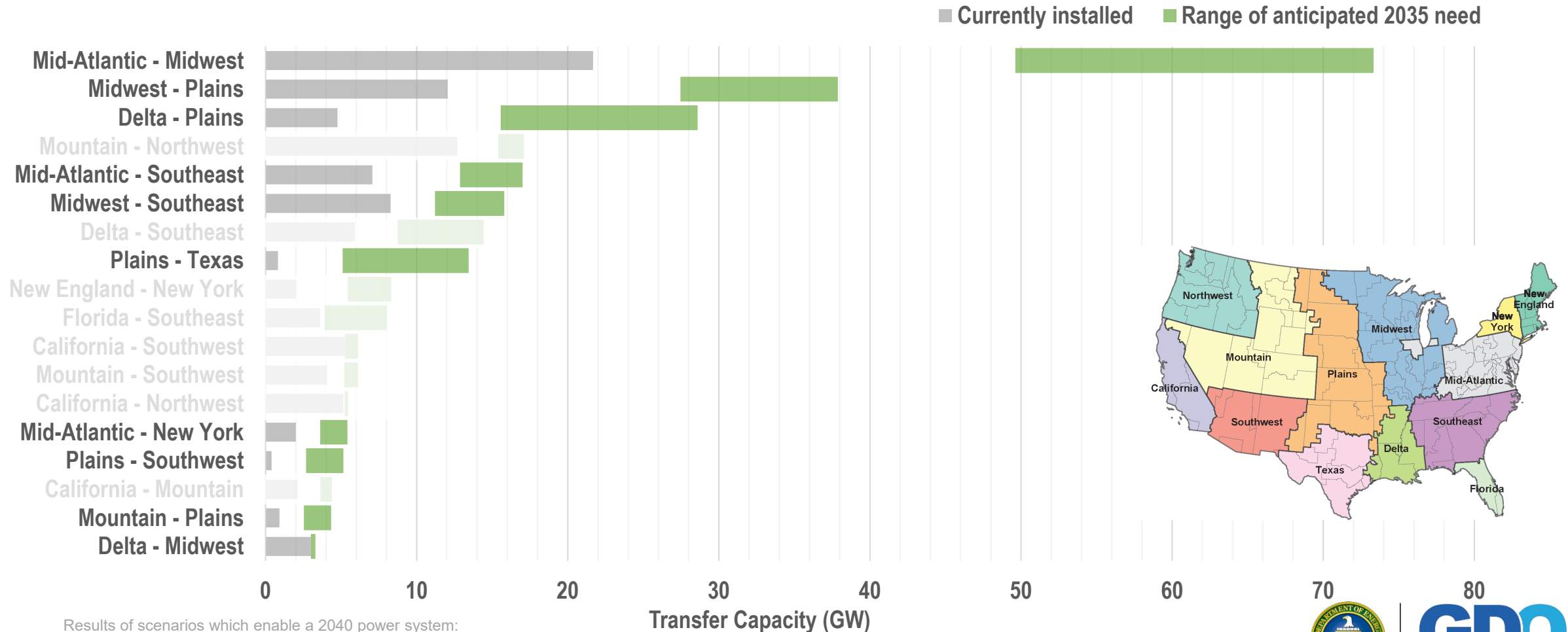


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Your input is requested!

To comment on the Needs Study, please email your comments as a **pdf attachment** to

NeedsStudy.Comments@hq.doe.gov

Deadline April 20



Thank you!

NeedsStudy.Comments@hq.doe.gov

