

THE GRID WE NEED TO DECARBONIZE AMERICA

Jesse D. Jenkins

June 13th, 2023 – Electricity System Integration Group Long-term Load Forecasting Workshop

A photograph of the United States Capitol building in Washington, D.C. The image shows the iconic white dome with its golden top and the surrounding neoclassical architecture. The sky is blue with scattered white clouds. An American flag is visible on a tall pole to the right of the dome.

The **full financial might** of the federal government is now aligned behind the clean energy transition

The Infrastructure Law and Inflation Reduction Act put **clean energy*** on sale

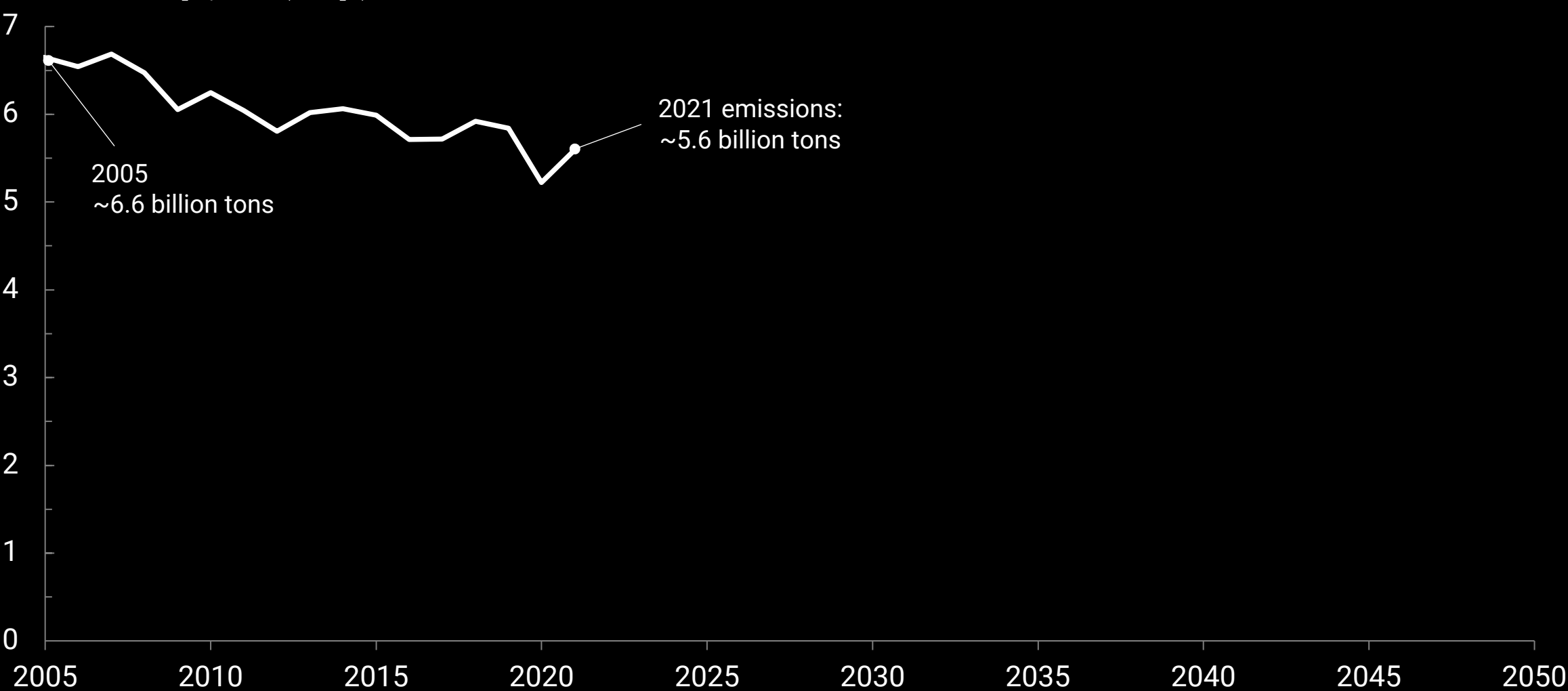
* (and other climate solutions)



Progress on the Path to Net-Zero

Historical and Modeled Net U.S. Greenhouse Gas Emissions (Including Land Carbon Sinks)

billion metric tons CO₂-equivalent (Gt CO₂-e)¹



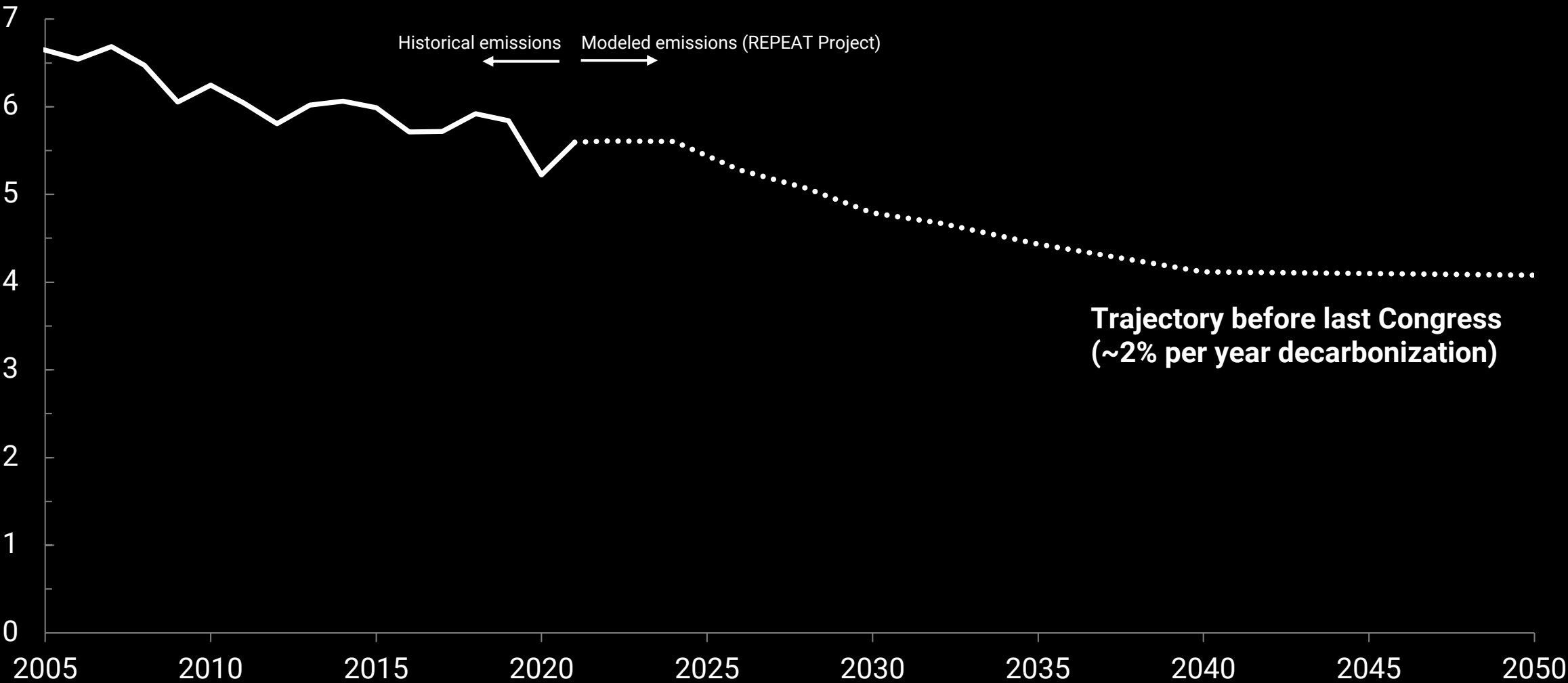
1 - CO₂ equivalent emissions calculations use IPCC AR4 100 year global warming potential as per [EPA Inventory of Greenhouse Gas Emissions and Sinks](#).

Data source: "Preview: Final REPEAT Project Findings on the Emissions Impacts of the Inflation Reduction Act and Infrastructure Investment and Jobs Act," REPEAT Project, April, 2023

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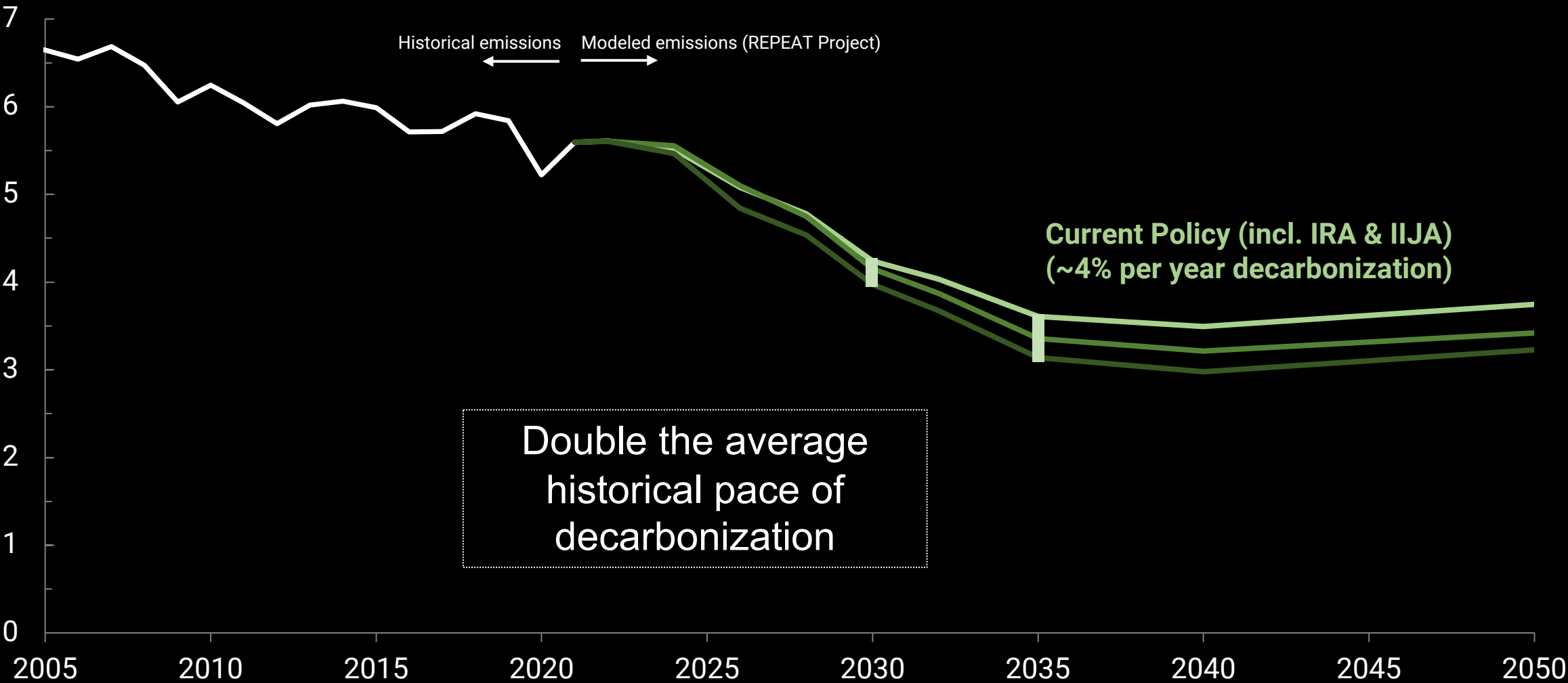
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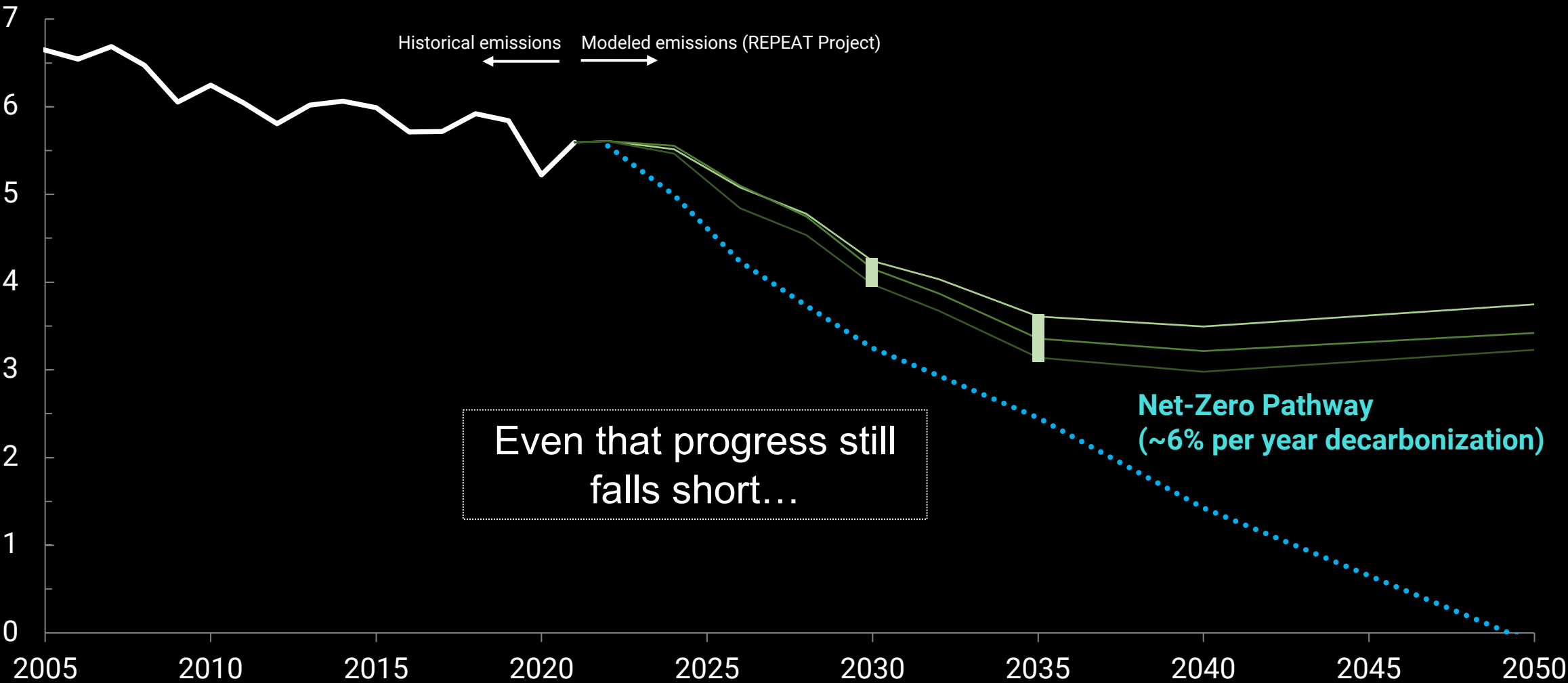


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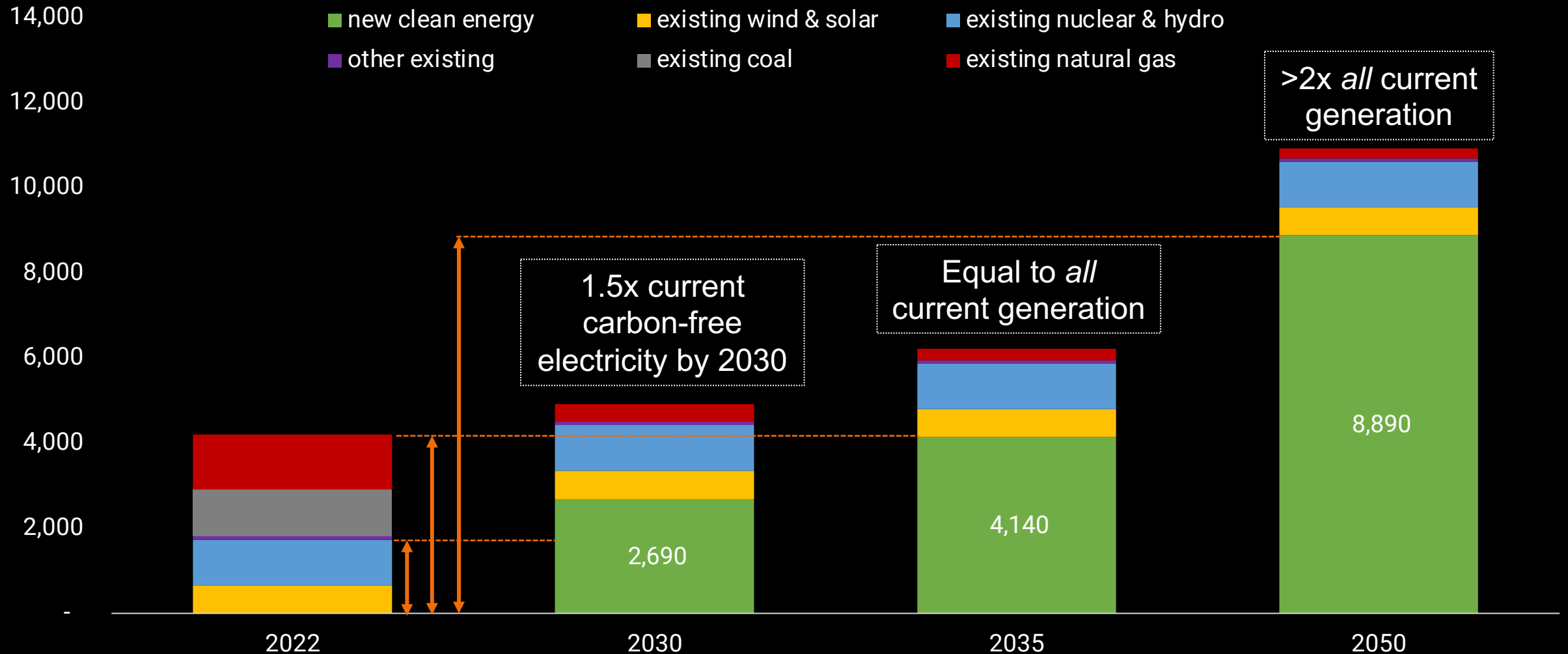
The background of the slide features a series of high-voltage electrical transmission towers, also known as pylons, silhouetted against a dramatic sky at sunset or sunrise. The sky is filled with soft, orange and yellow clouds, with the sun's glow visible near the horizon. The towers are arranged in a receding line, creating a sense of depth. A semi-transparent light blue horizontal band is positioned across the middle of the image, serving as a backdrop for the text.

**The new challenge: how do we mobilize a nation
to build energy infrastructure at scale?**

Clean electricity: the linchpin

Total annual U.S. electricity generation by resource

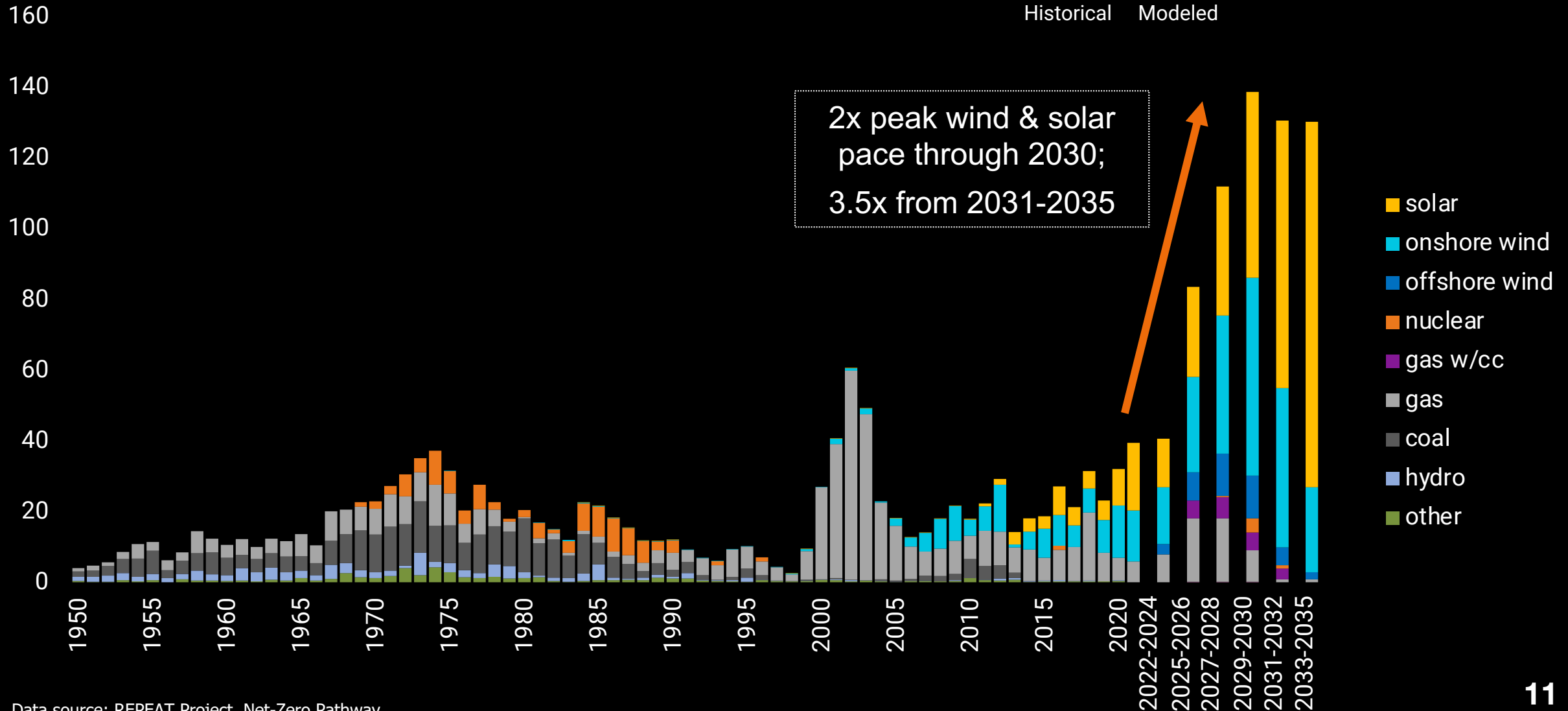
Billion kilowatt-hours (or terawatt-hours)



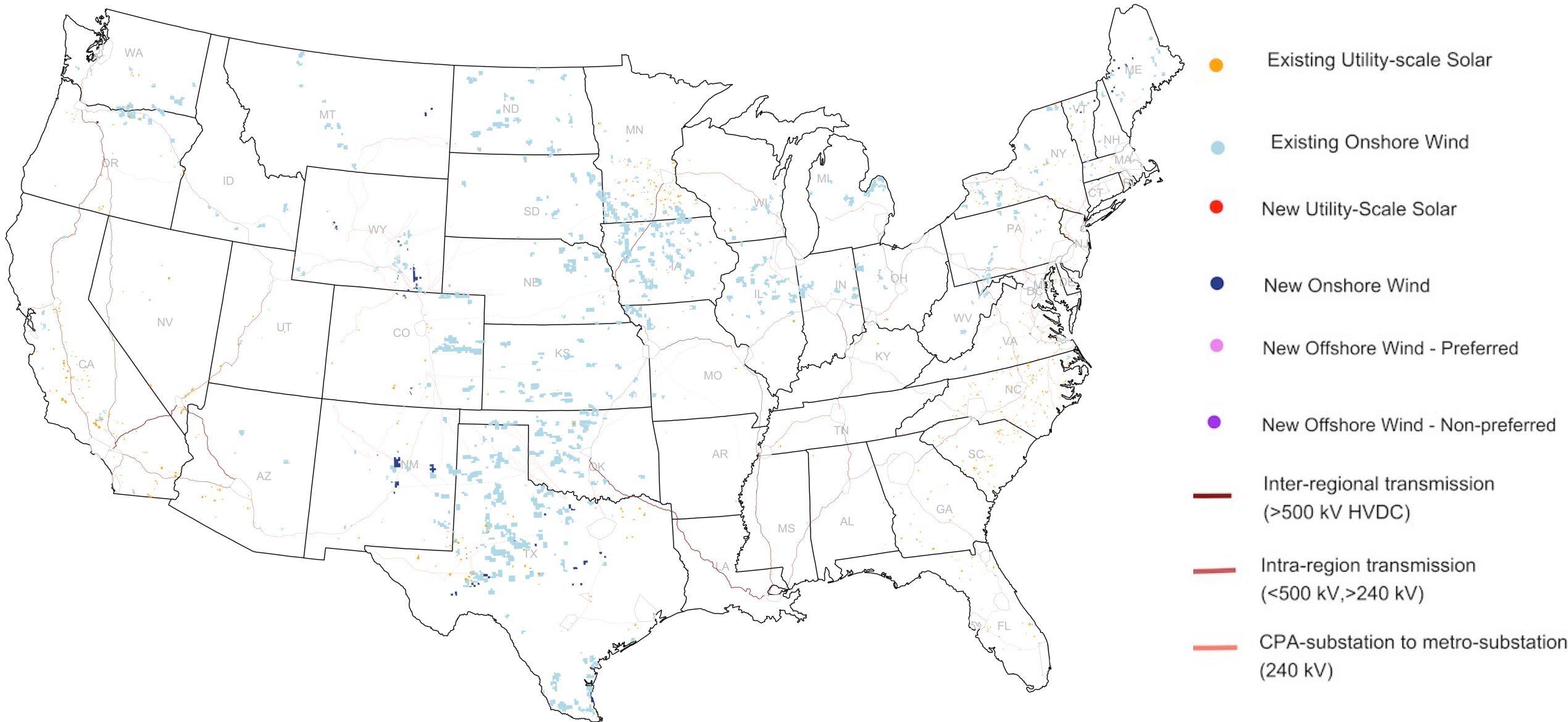
Smashing new records

Historical power generation capacity additions vs modeled Net-Zero Pathway

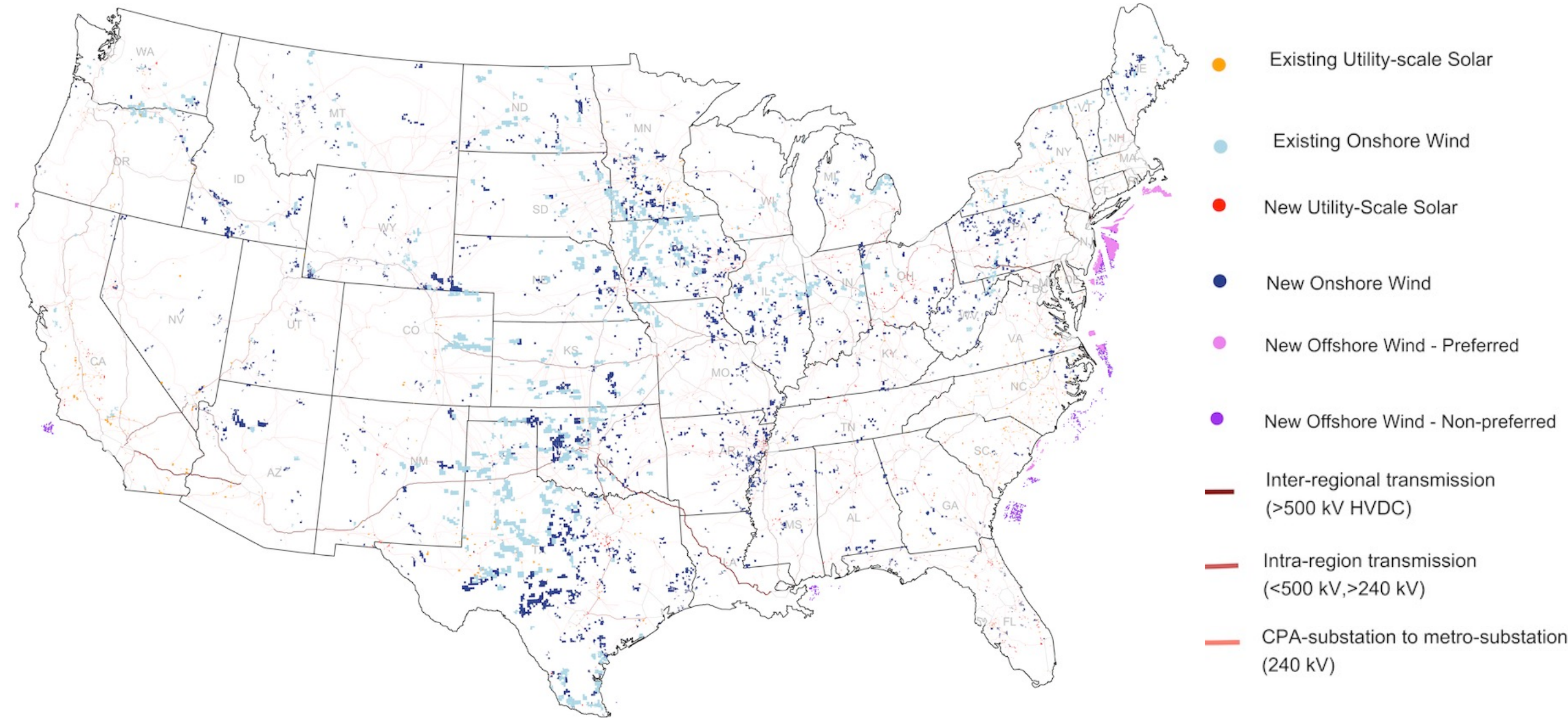
gigawatts per year



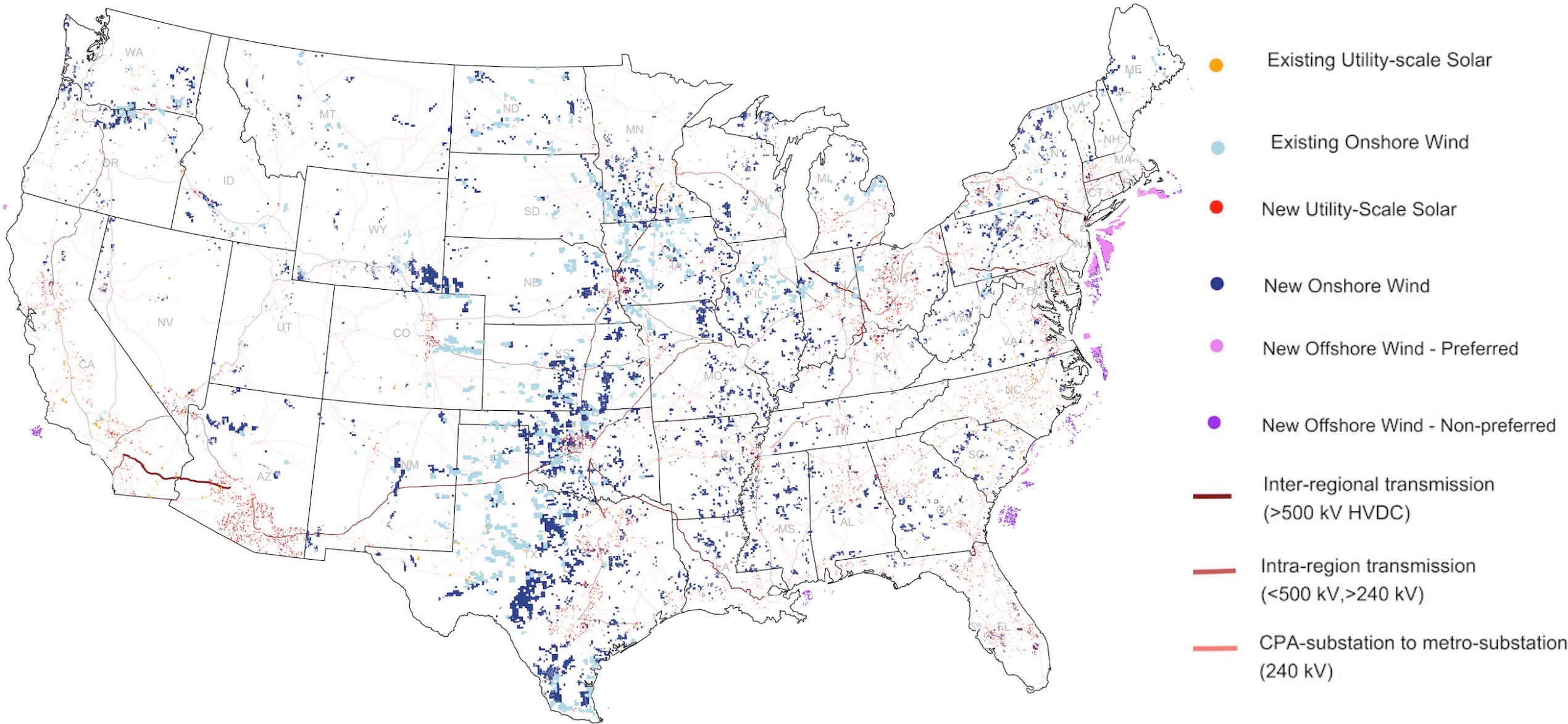
2022



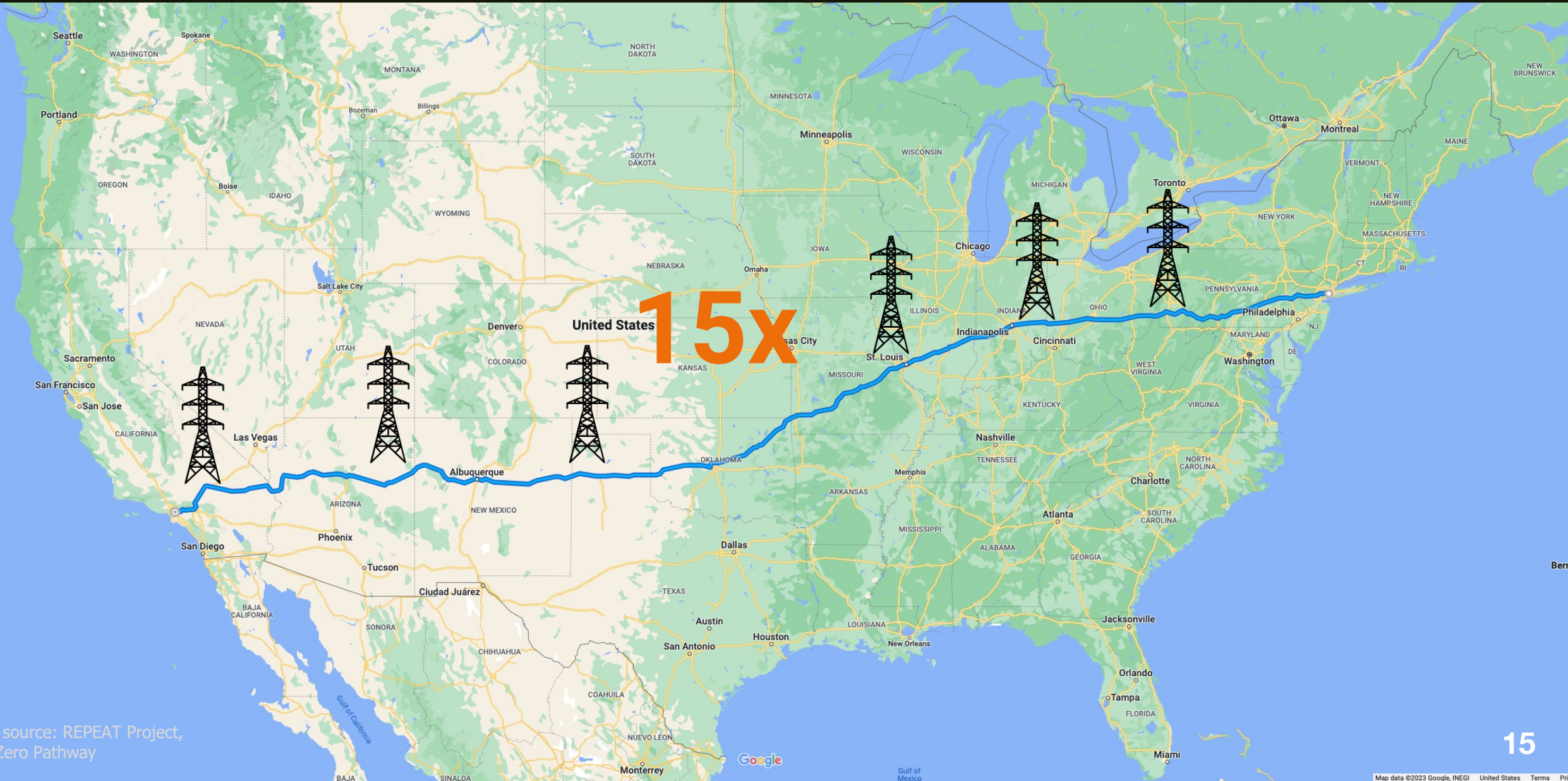
2032



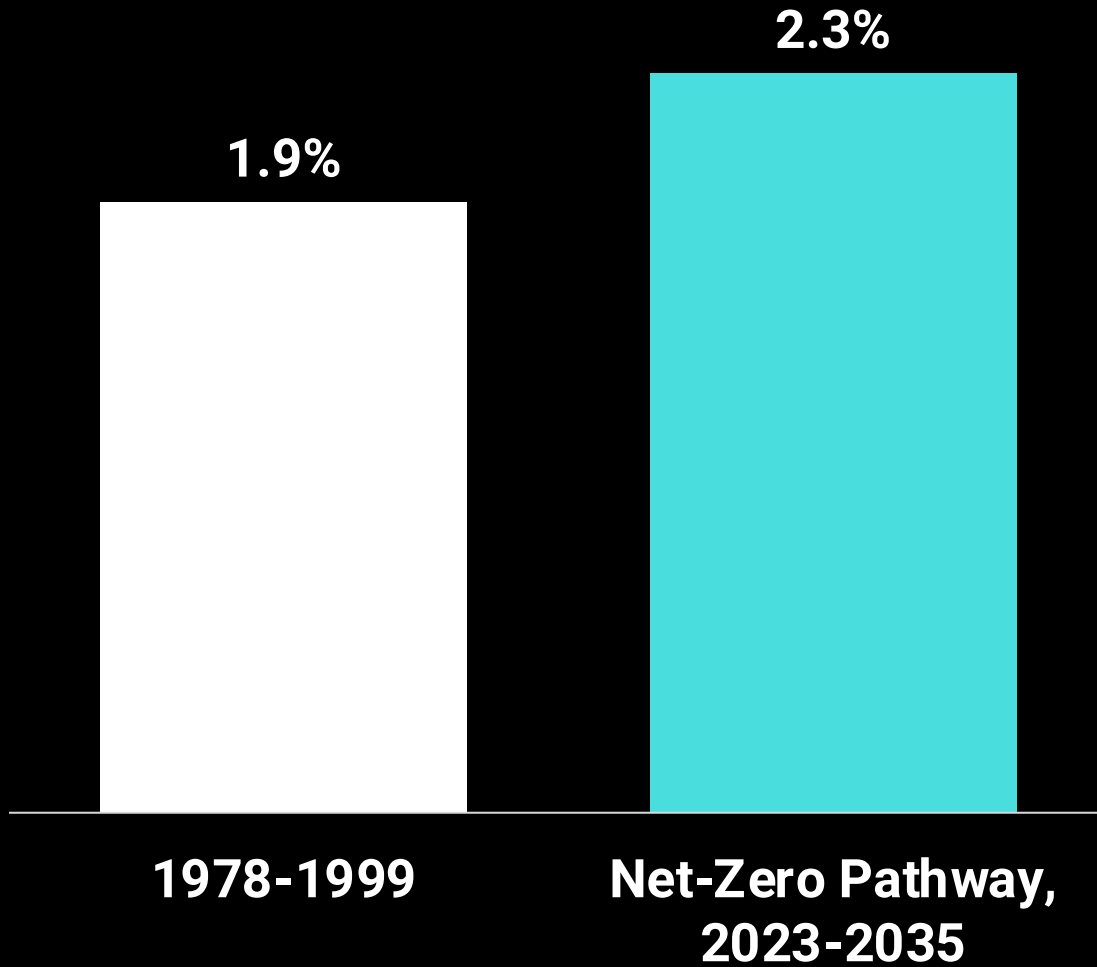
2050



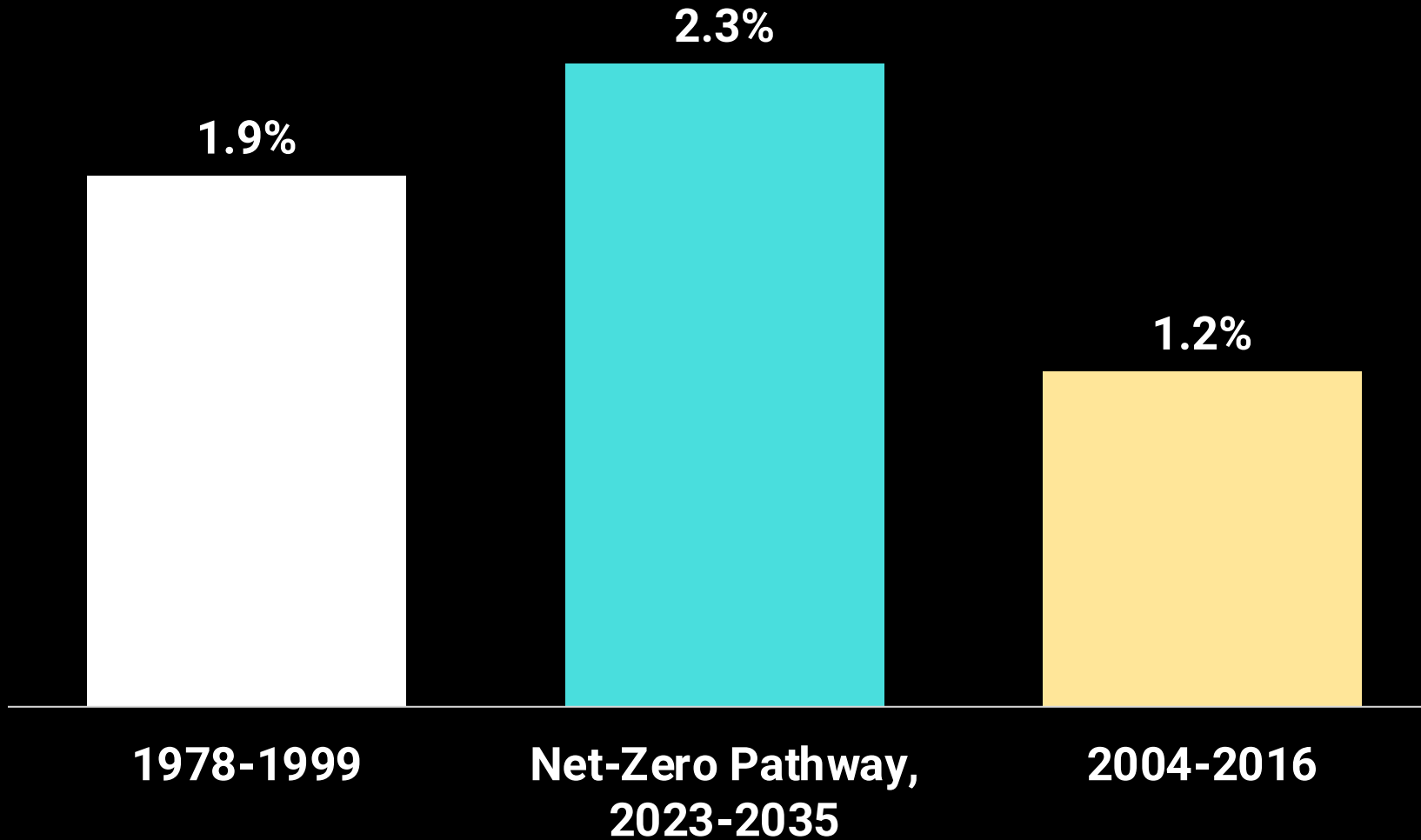
We're going to need a bigger grid



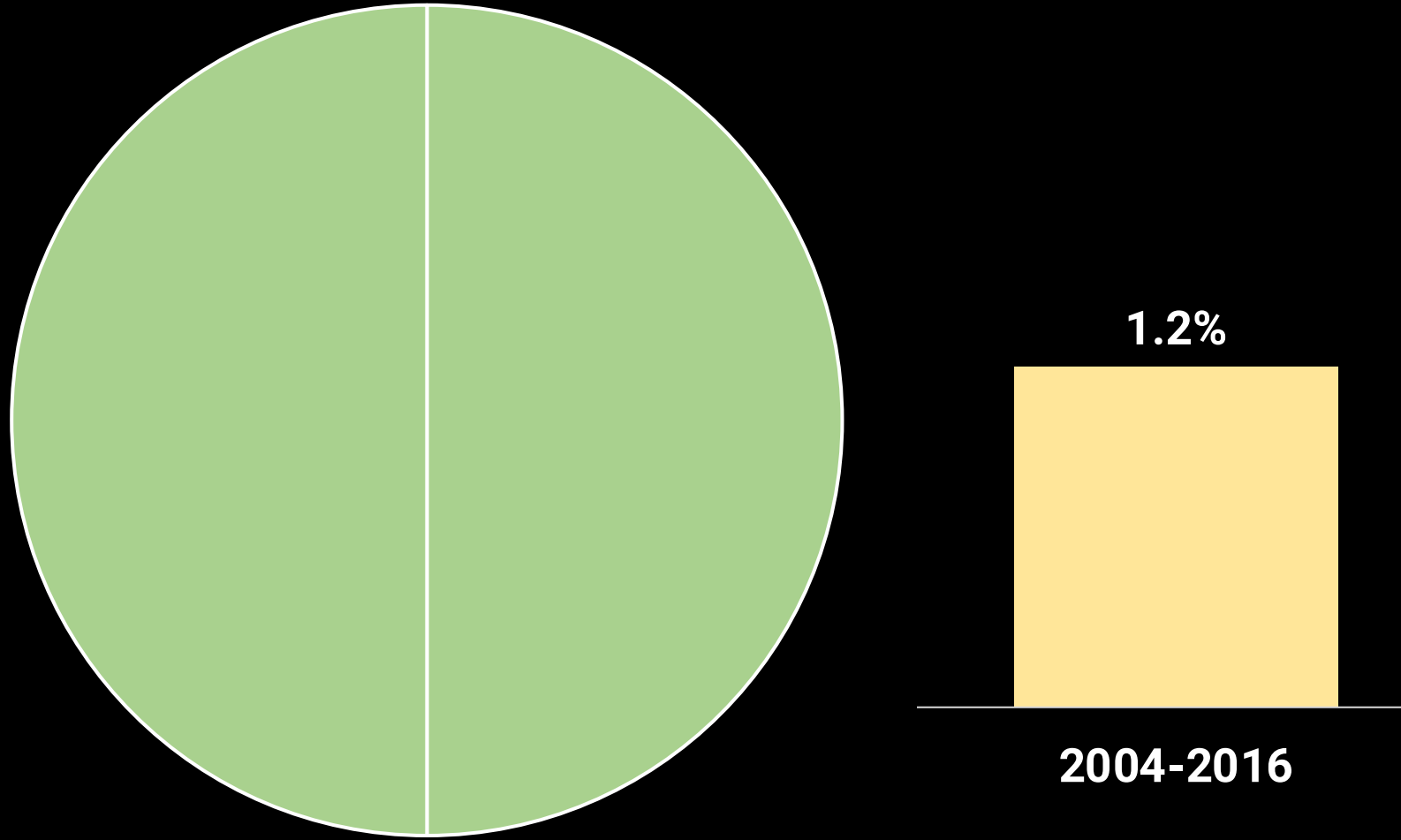
This isn't impossible...



...but the price of failure is high

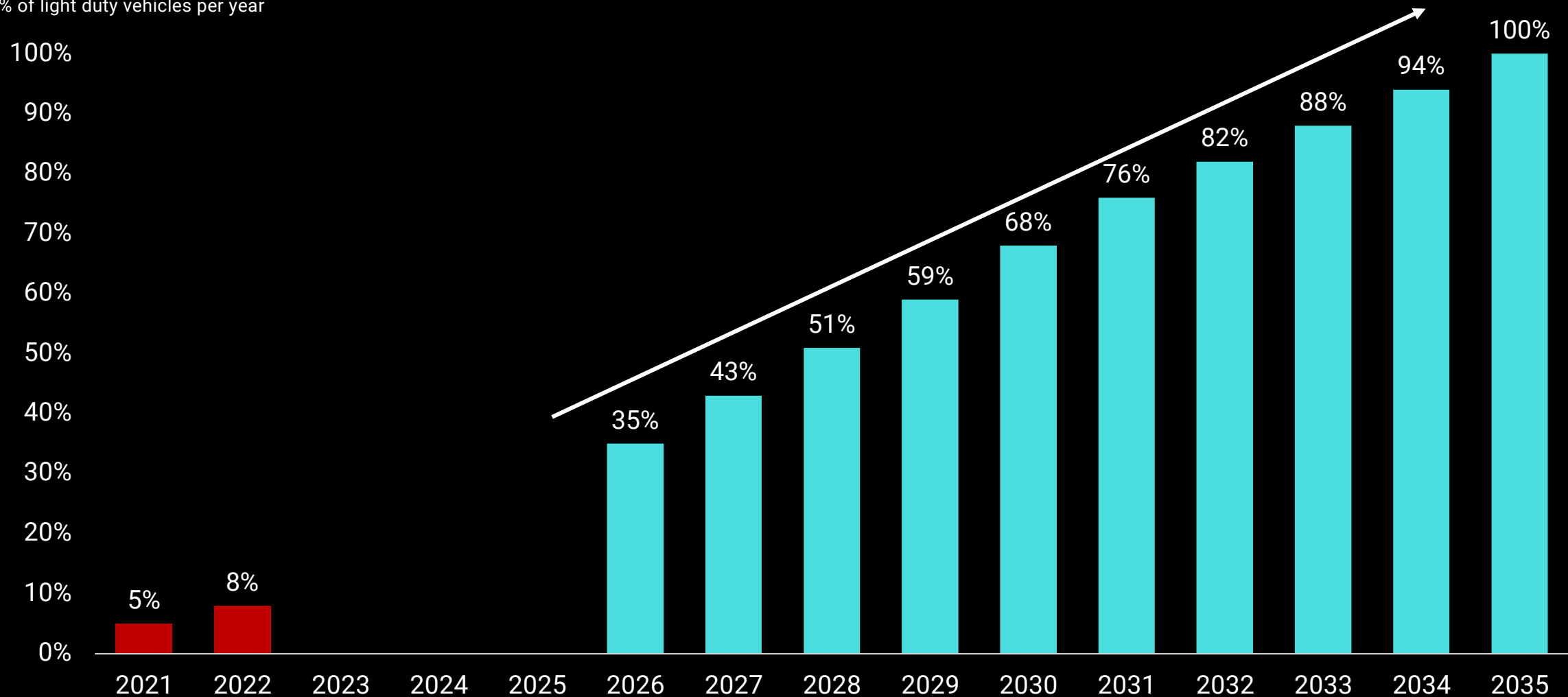


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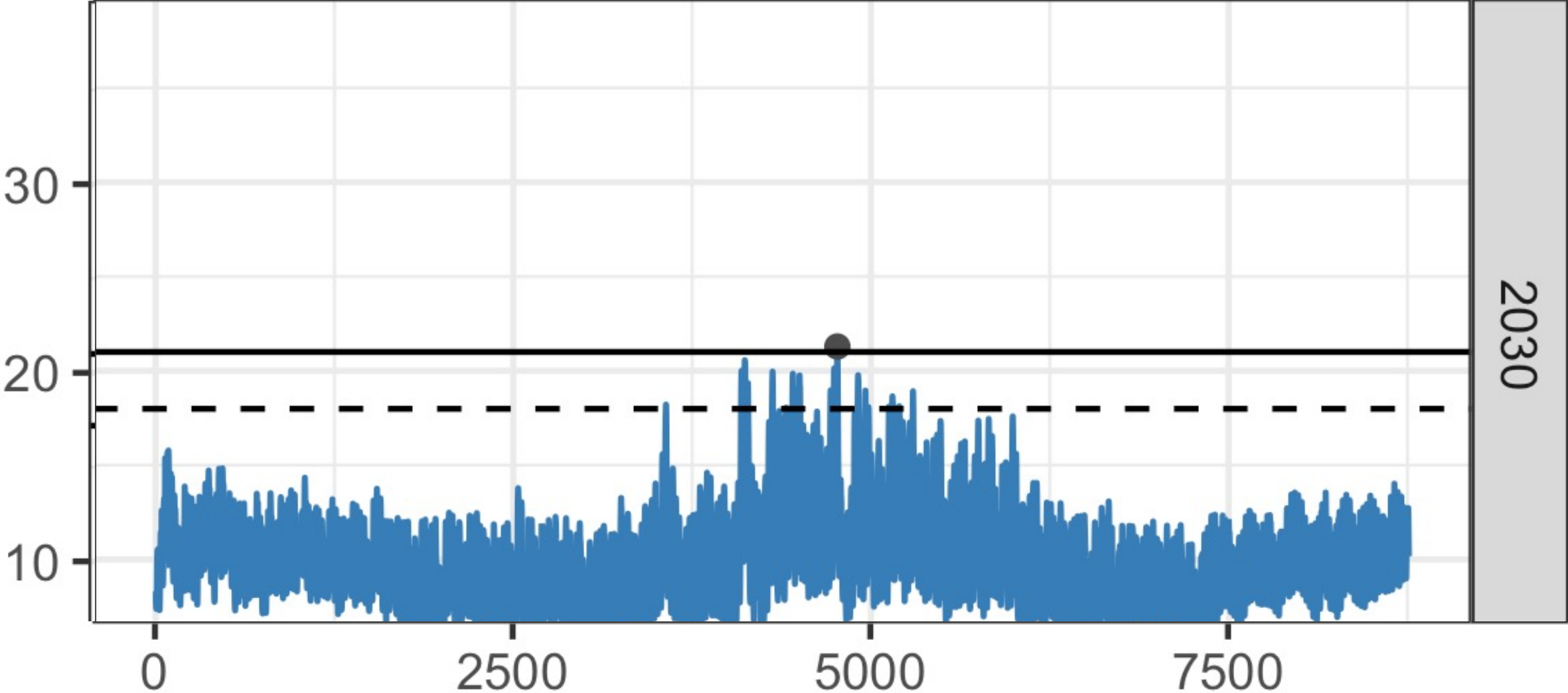
EVs (and More) Are Plugging In

Historical New Jersey EV and PHEV light vehicle sales sales and Advanced Clean Cars II targets
% of light duty vehicles per year



New Demand, New Patterns

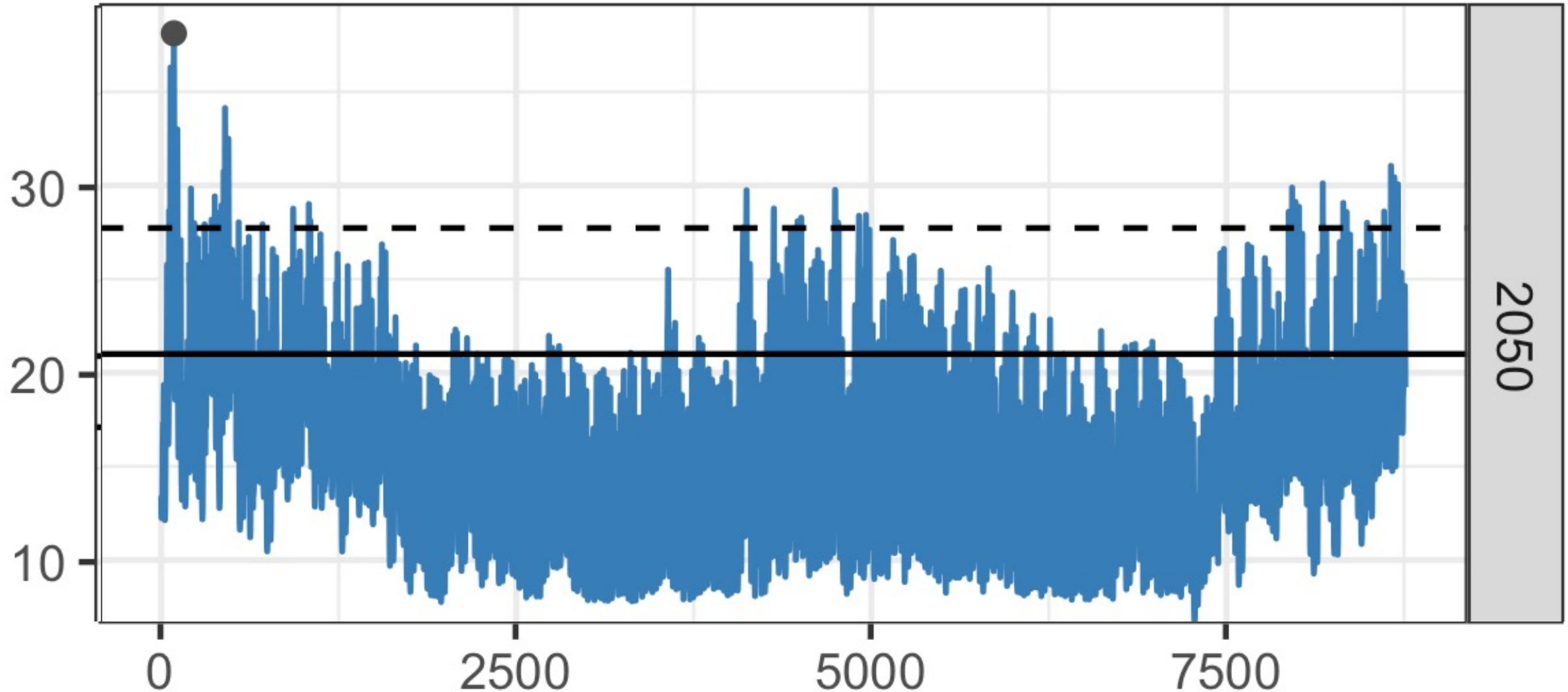
New Jersey Electricity Demand Profile, Stated Policies Scenario*



*100% carbon-free electricity by 2050, economy-wide 80% below 2005 emissions limit, see <https://zenodo.org/record/6386823>

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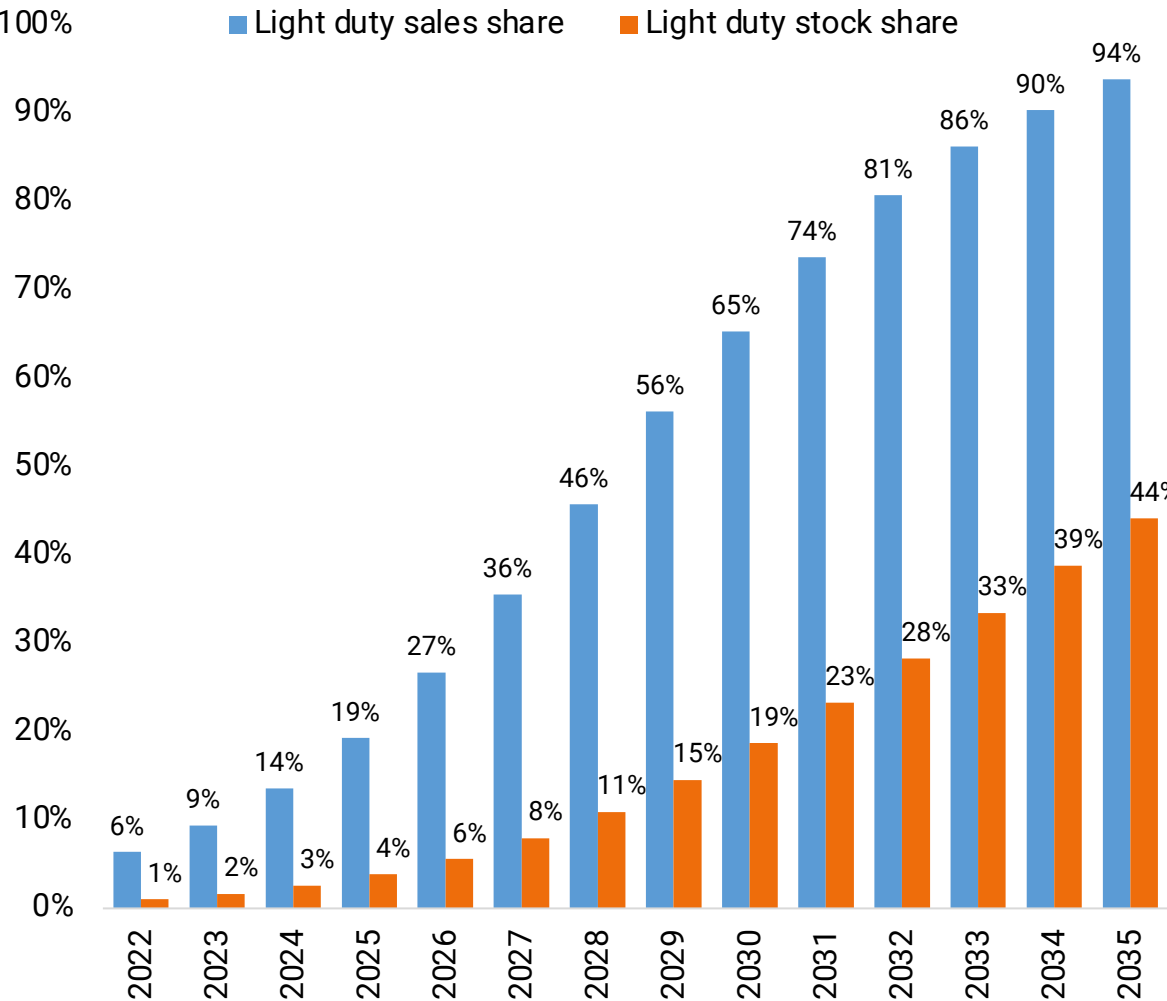
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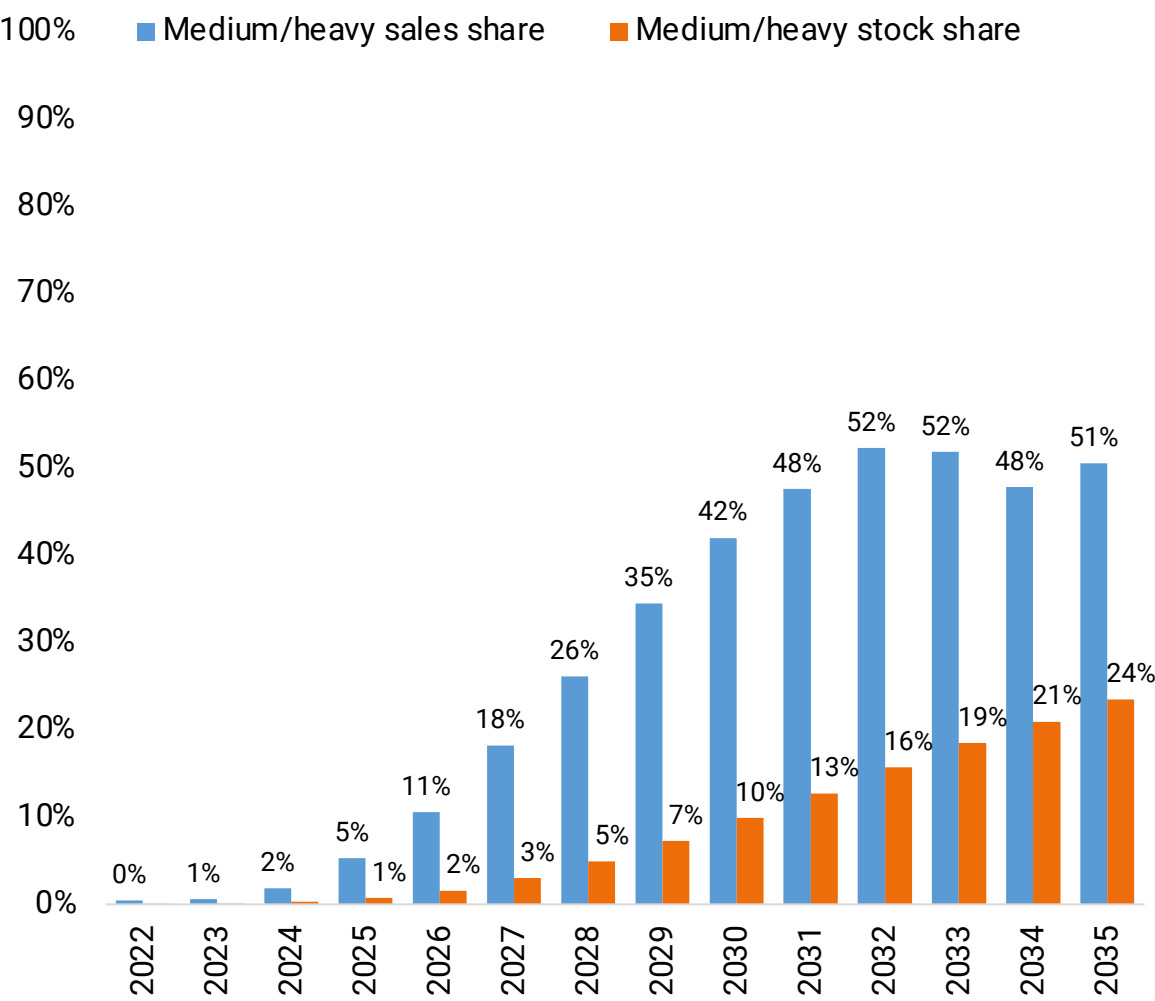
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But We Have Time to Prepare

Modeled US EV and PHEV sales and stock shares
Light duty vehicles



Medium & heavy duty vehicles

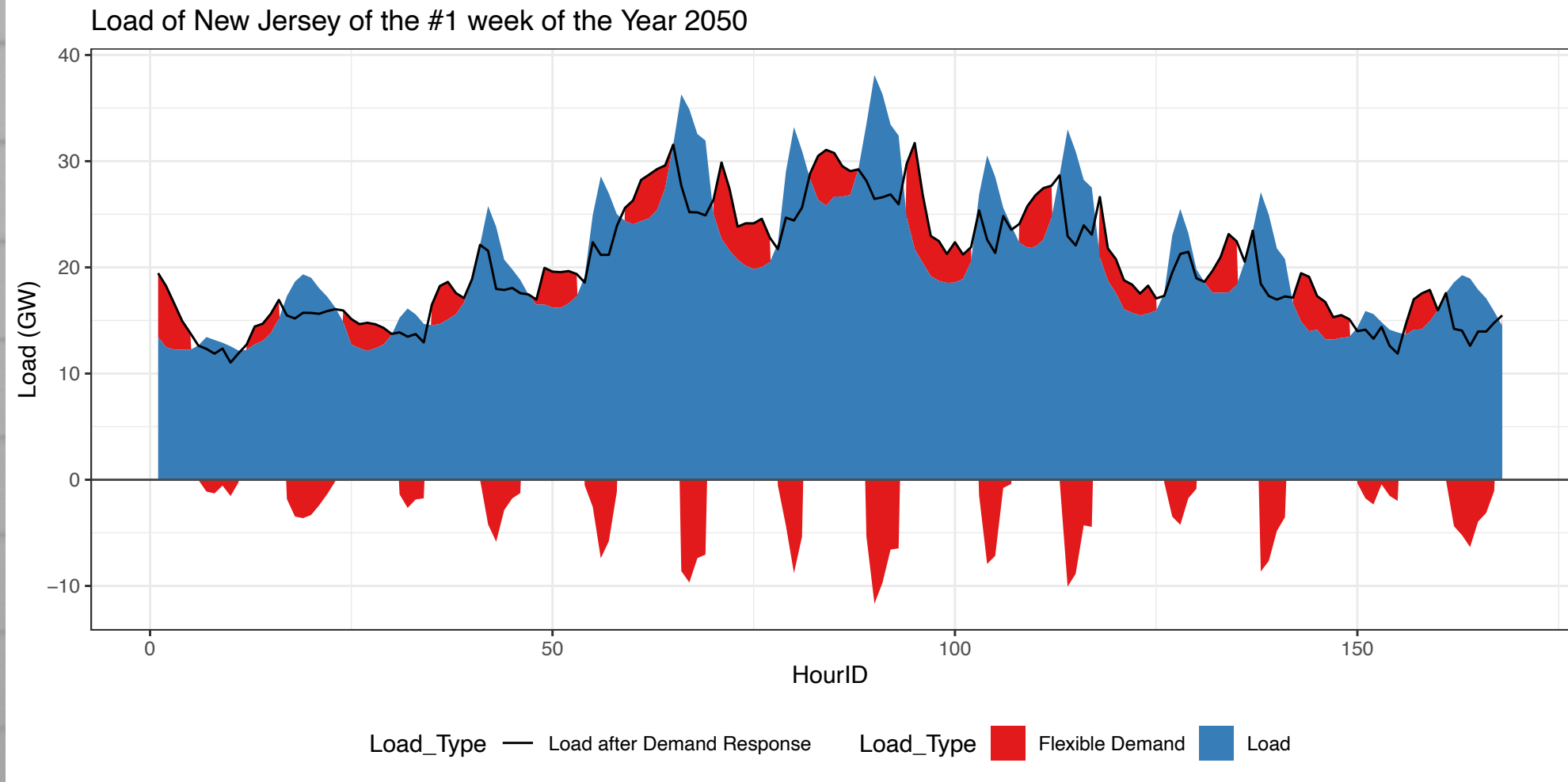


Unlocking Demand Flexibility Will Be Key

US electric cars sold in 2022 averaged 291 miles range
That's 7 days of the average American's daily commute

An EV battery offers enormous flexibility to shift charging patterns to avoid stressing the grid...
...if properly incentivized.

Unlocking Demand Flexibility Will Be Key



Unlocking flexible EV charging and water heating could reduce New Jersey peak demand by 17% (>6 GW) in 2050.

BUILD...

BUILD...

BUILD!

**ALLIED
PROPAGANDA
POSTERS OF WWII**



WE CAN...WE WILL...WE MUST!

CARL PAULSON



Jesse D. Jenkins

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