



Opportunities for US Farmland in a Net Zero World

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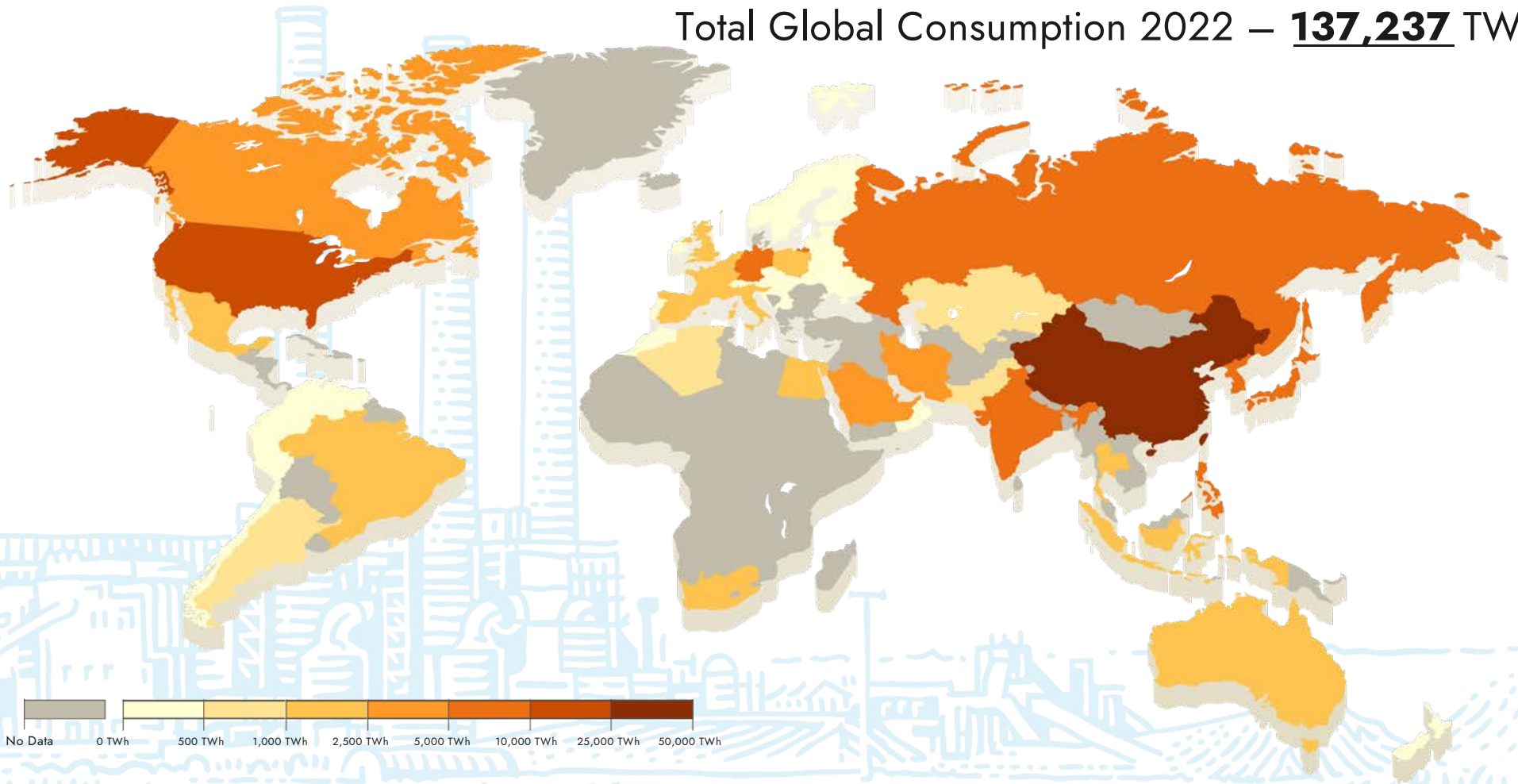


“The beginning of the end of fossil fuels.”

Simon Stiell



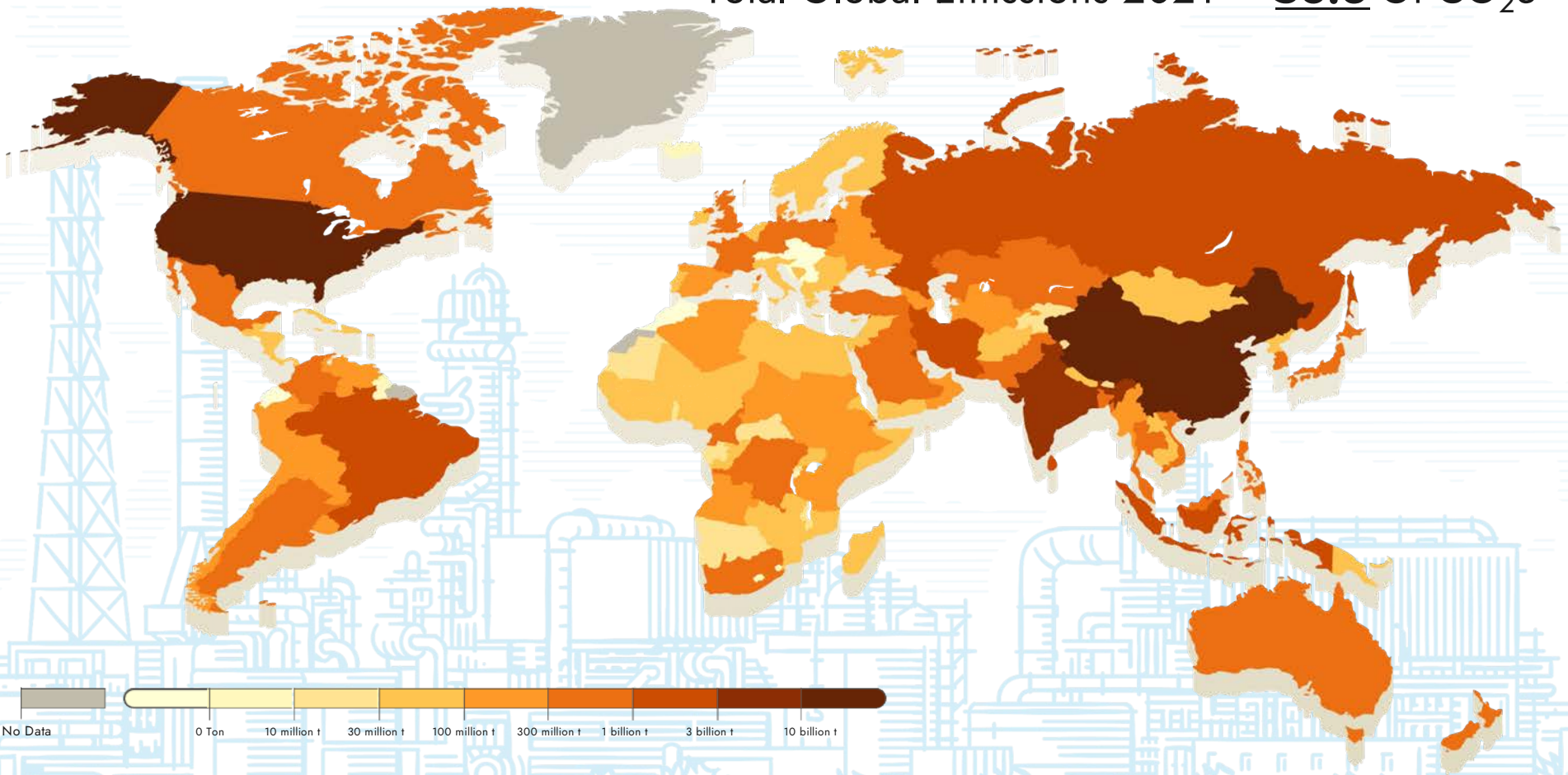
Total Global Consumption 2022 – **137,237** TWh



 Fossil Fuel Consumption 2022

Source: Energy Institute - Statistical Review of World Energy (2023)

Total Global Emissions 2021 – **58.3** Gt CO₂e



Greenhouse Gas Emissions 2021

Source: Jones et al. (2023)



Low Carbon Energy
Transition

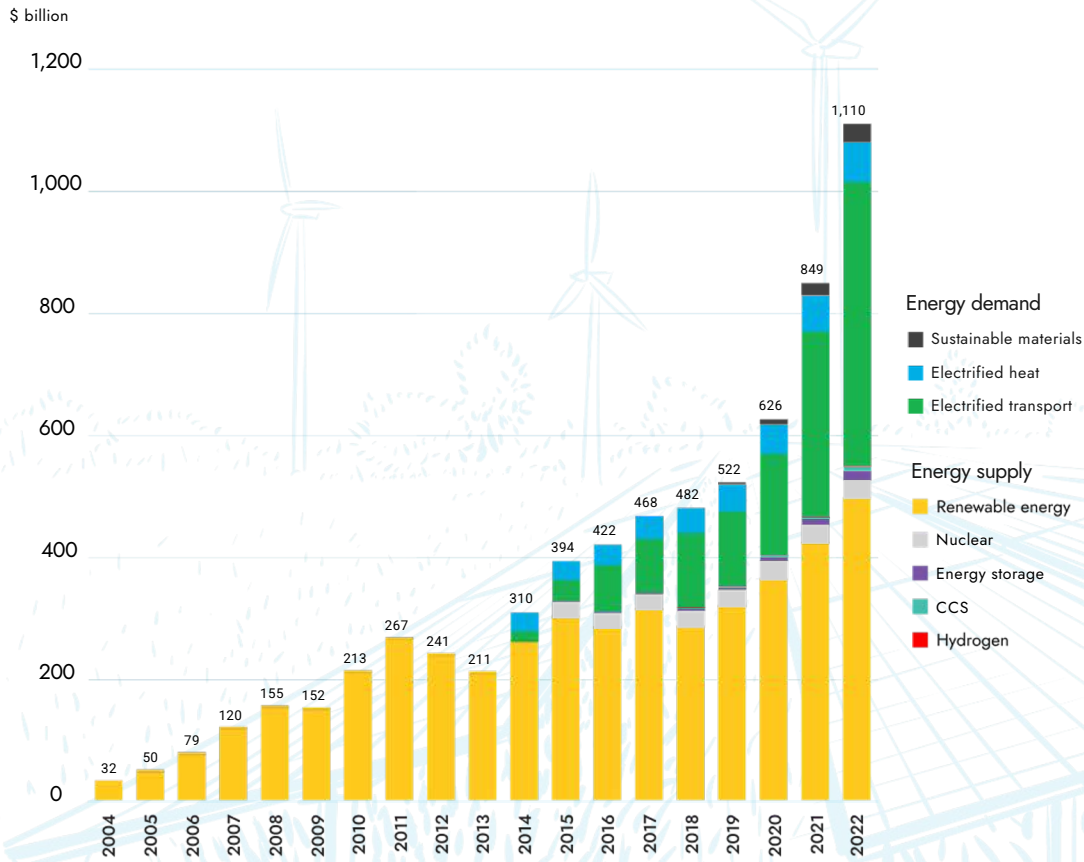


Carbon Storage

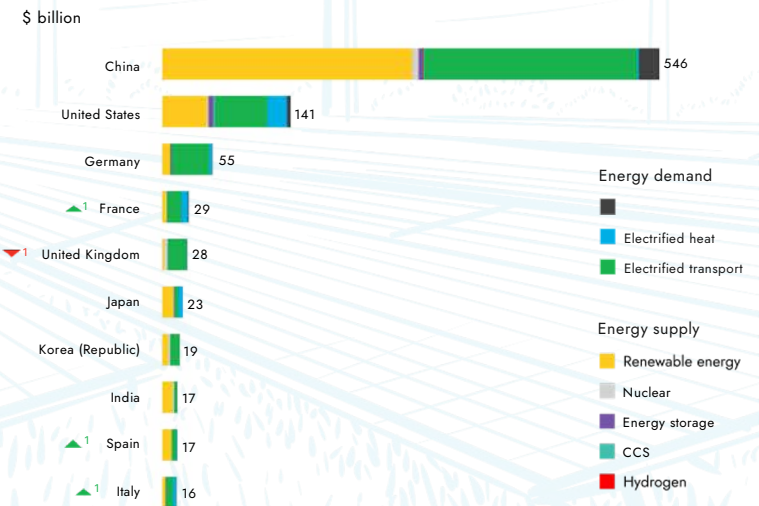


— Net Zero Farmland

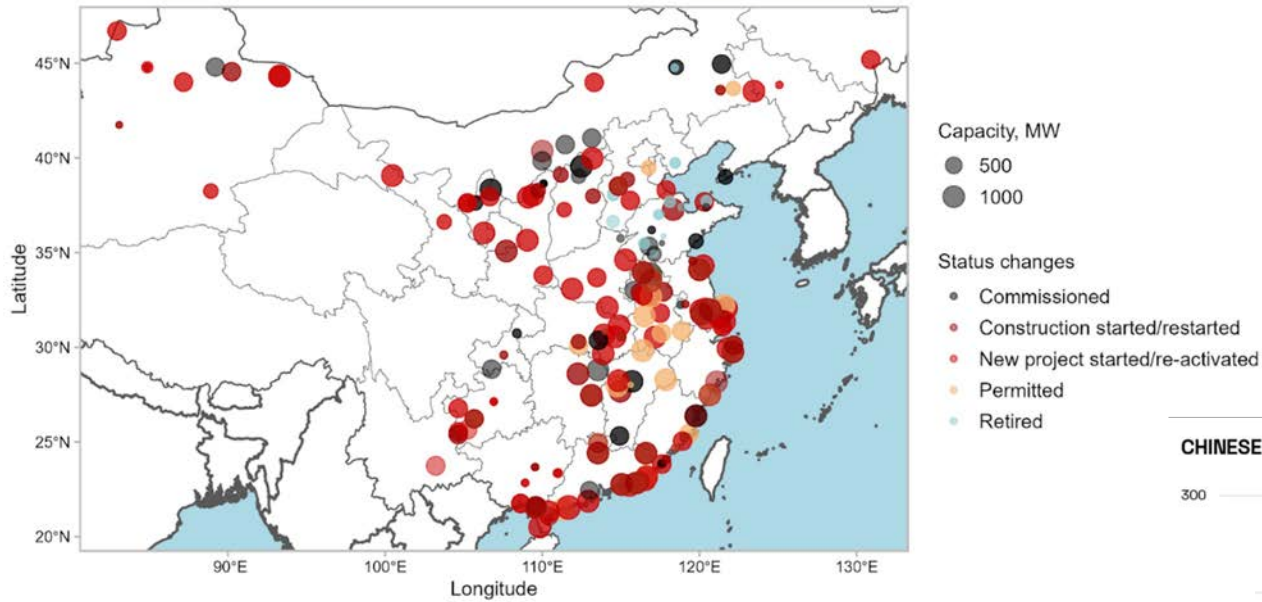
Global investment in energy transition by sector



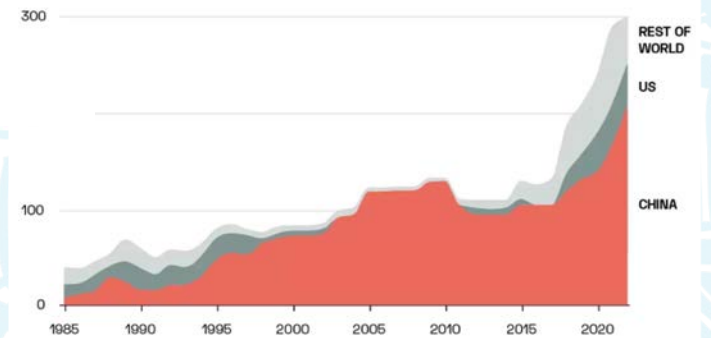
Top 10 countries for energy transition investment



New coal power projects and retirements in China 2022



CHINESE RARE EARTH PRODUCTION





— Net Zero Farmland - Low Carbon Energy Transition

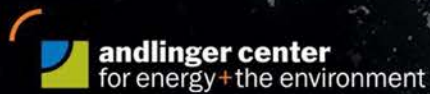
PRINCETON UNIVERSITY

NET-ZERO AMERICA

POTENTIAL PATHWAYS, INFRASTRUCTURE, AND IMPACTS

FINAL REPORT SUMMARY

OCTOBER 29, 2021



High Meadows
Environmental
Institute

Carbon
Mitigation
Initiative

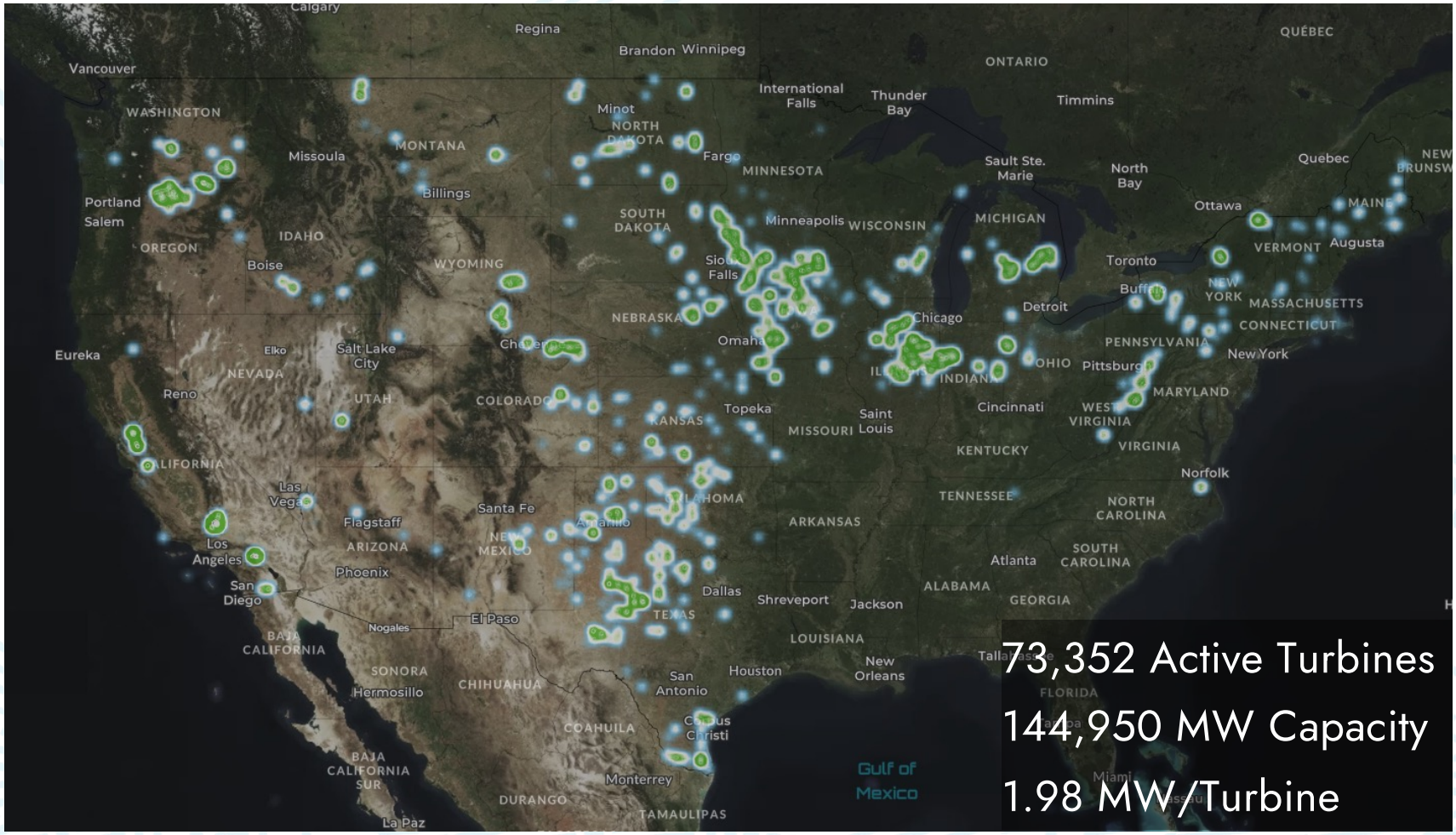


— Net Zero in Farmland

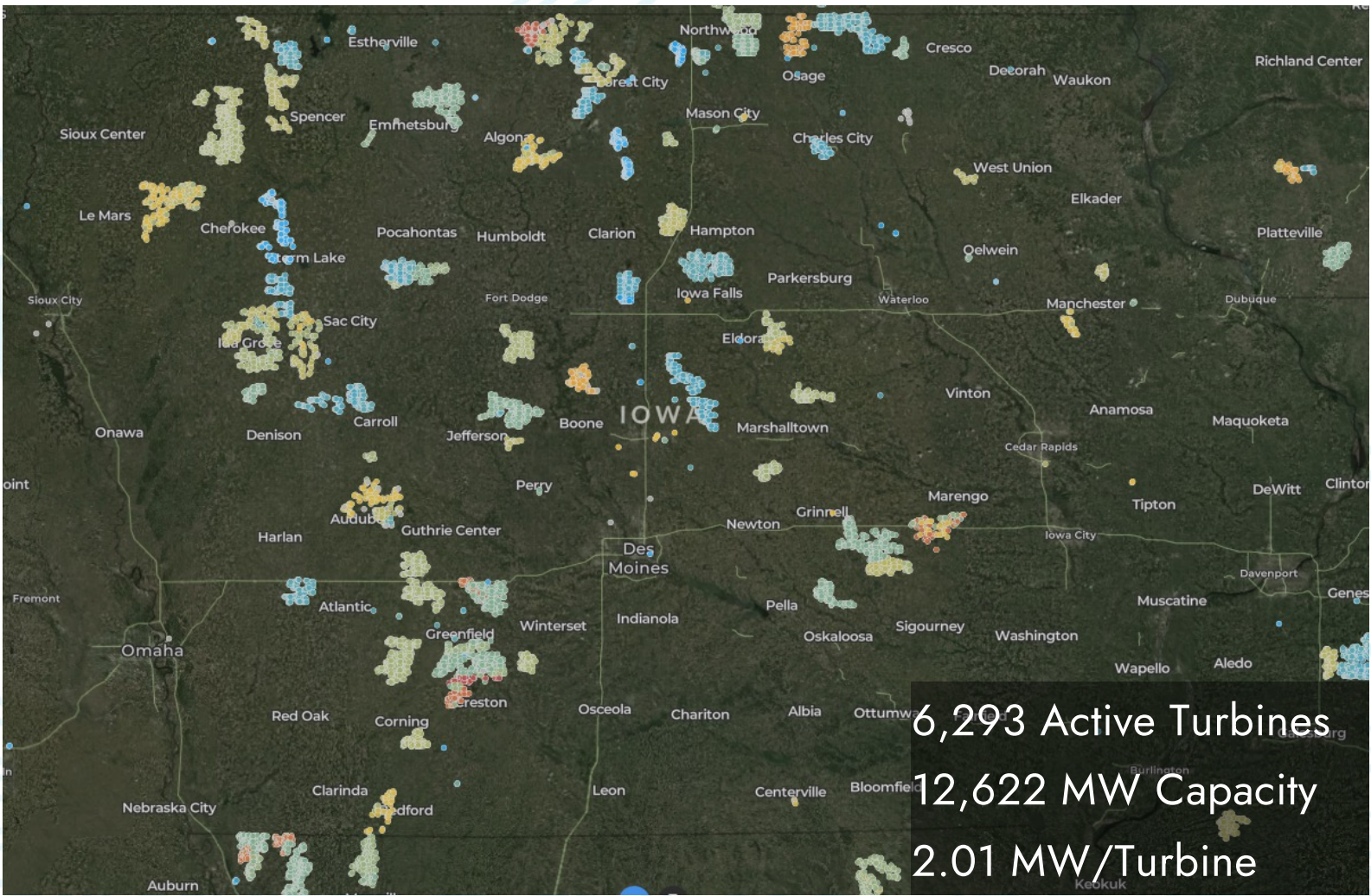
<https://netzeroamerica.princeton.edu>



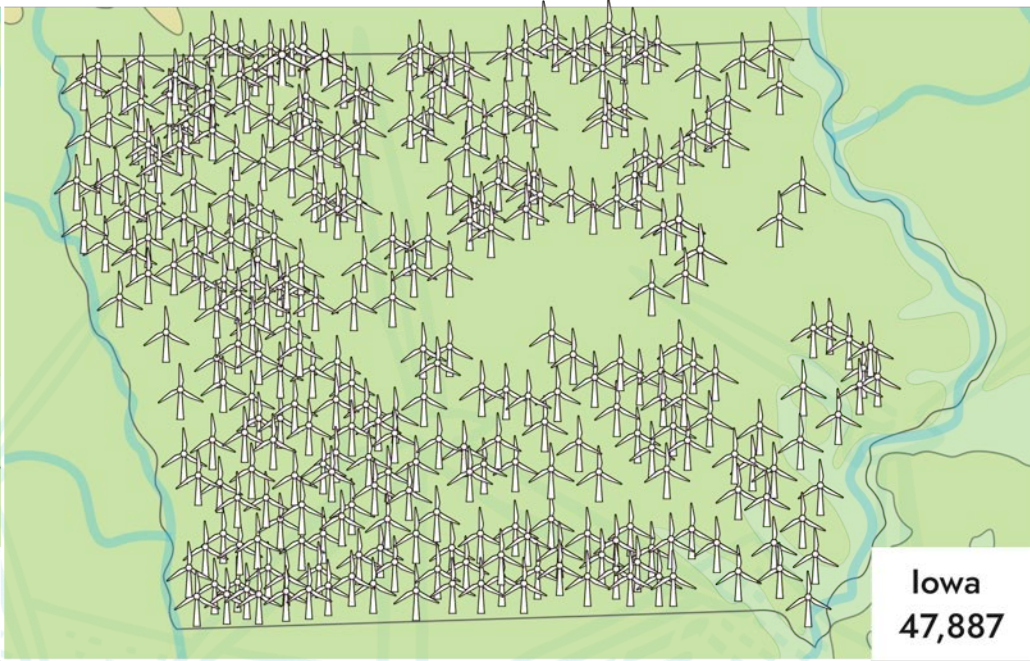
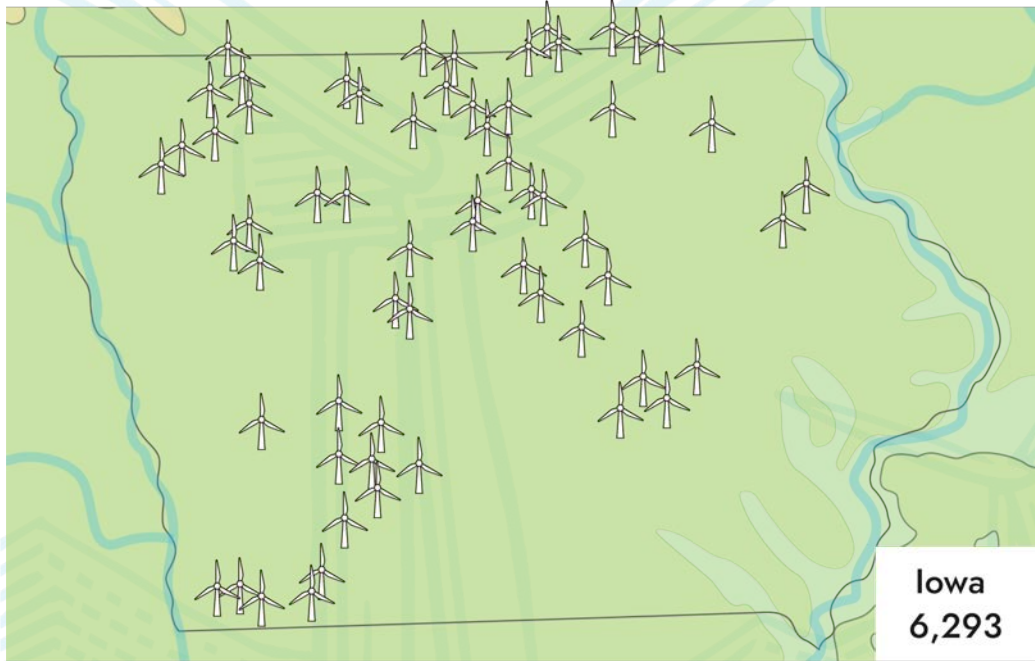
 — Net Zero Farmland — Wind Energy



— Net Zero in Farmland - Current Wind Production

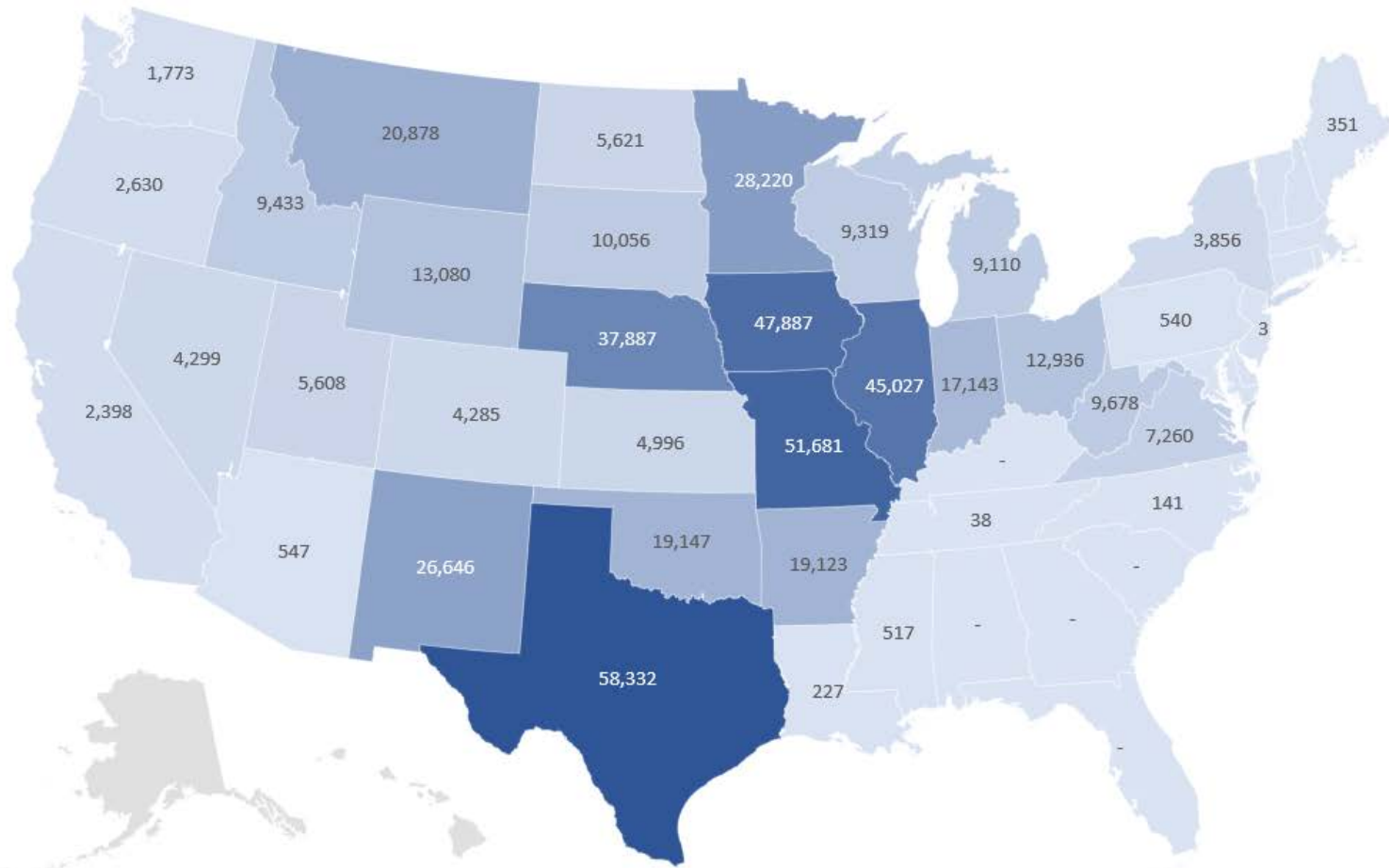


— Net Zero in Farmland - Current Wind Production in Iowa



Net Zero in Farmland - Current Turbines

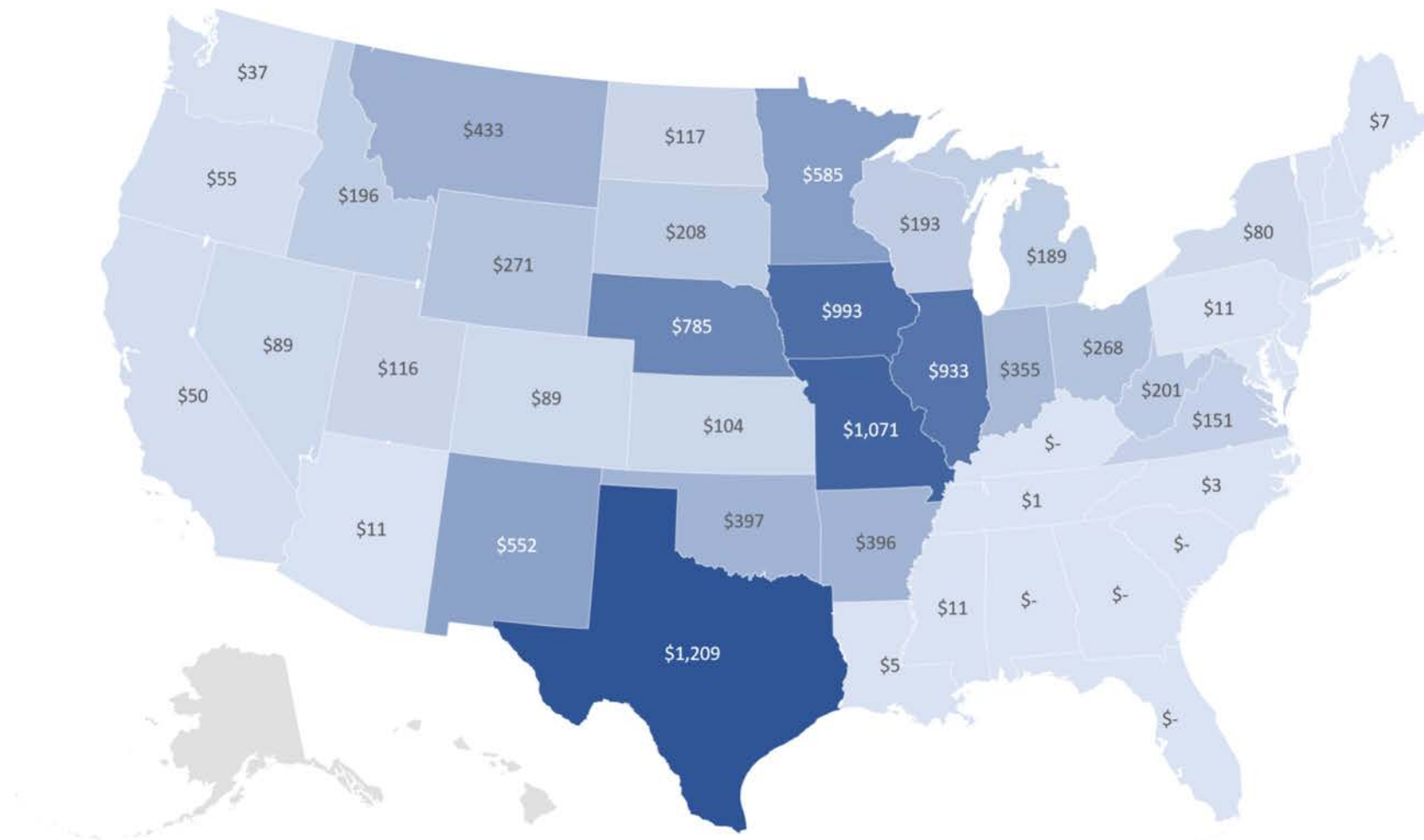
2050 State Level Wind Turbines



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 — 2050 Wind Turbines

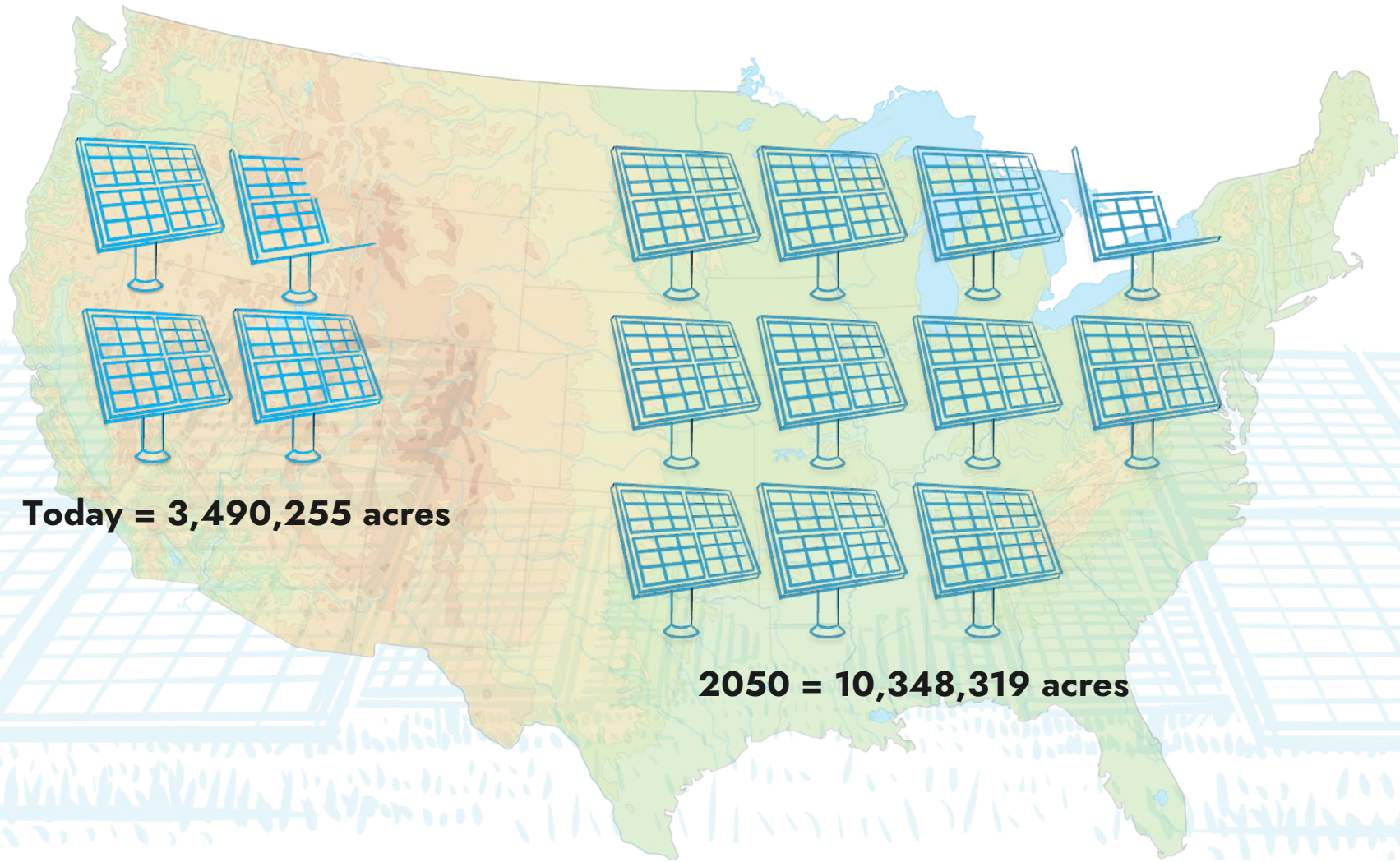
2050 State Level Lease Revenue - Wind Energy (\$1,000,000's)



— Net Zero in Farmland - Wind Lease Revenue

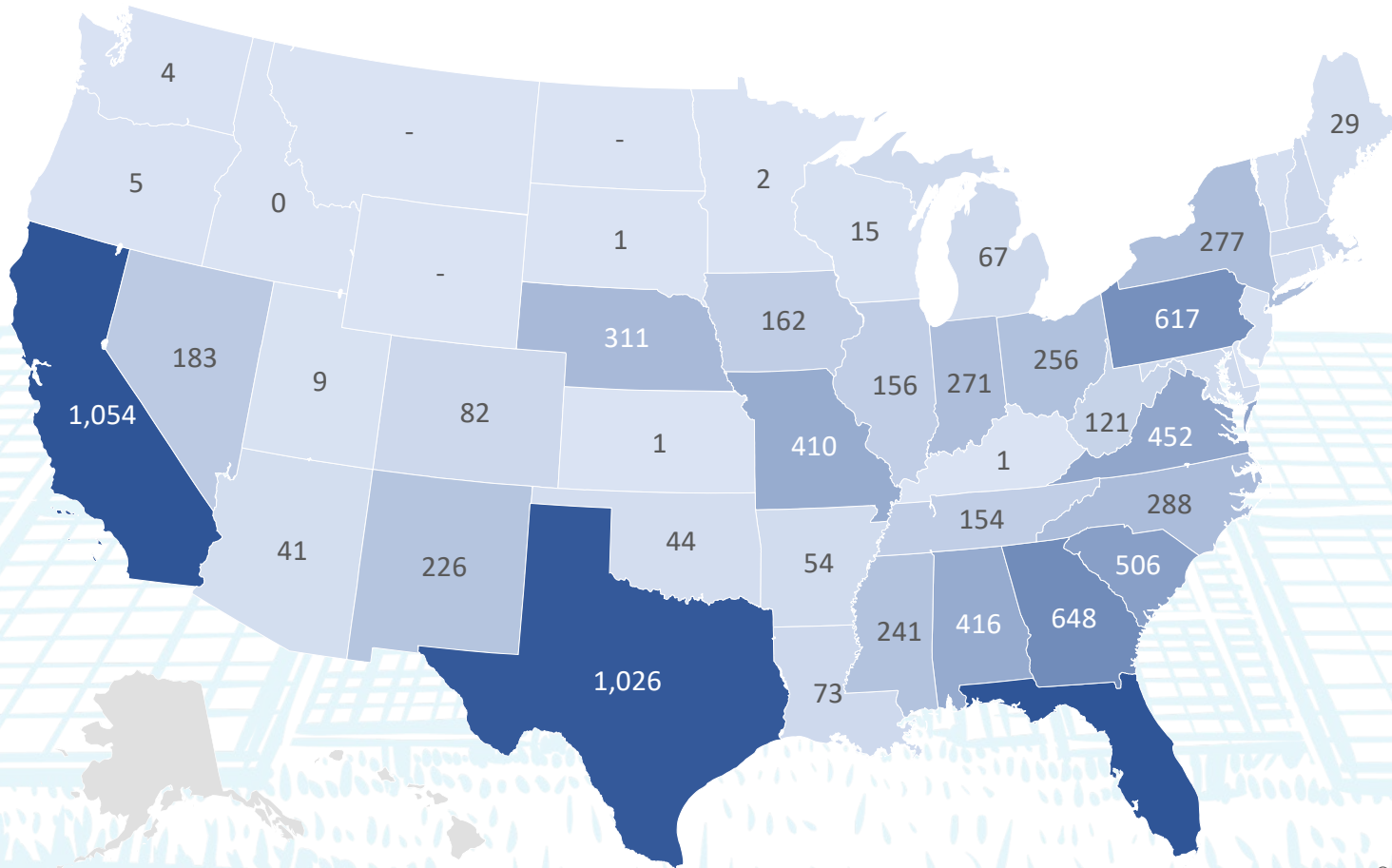


— Net Zero Farmland — Solar Energy



— Net Zero in Farmland - Solar Growth

2050 State Level Acres Committed to Solar Production (1,000's Acres)

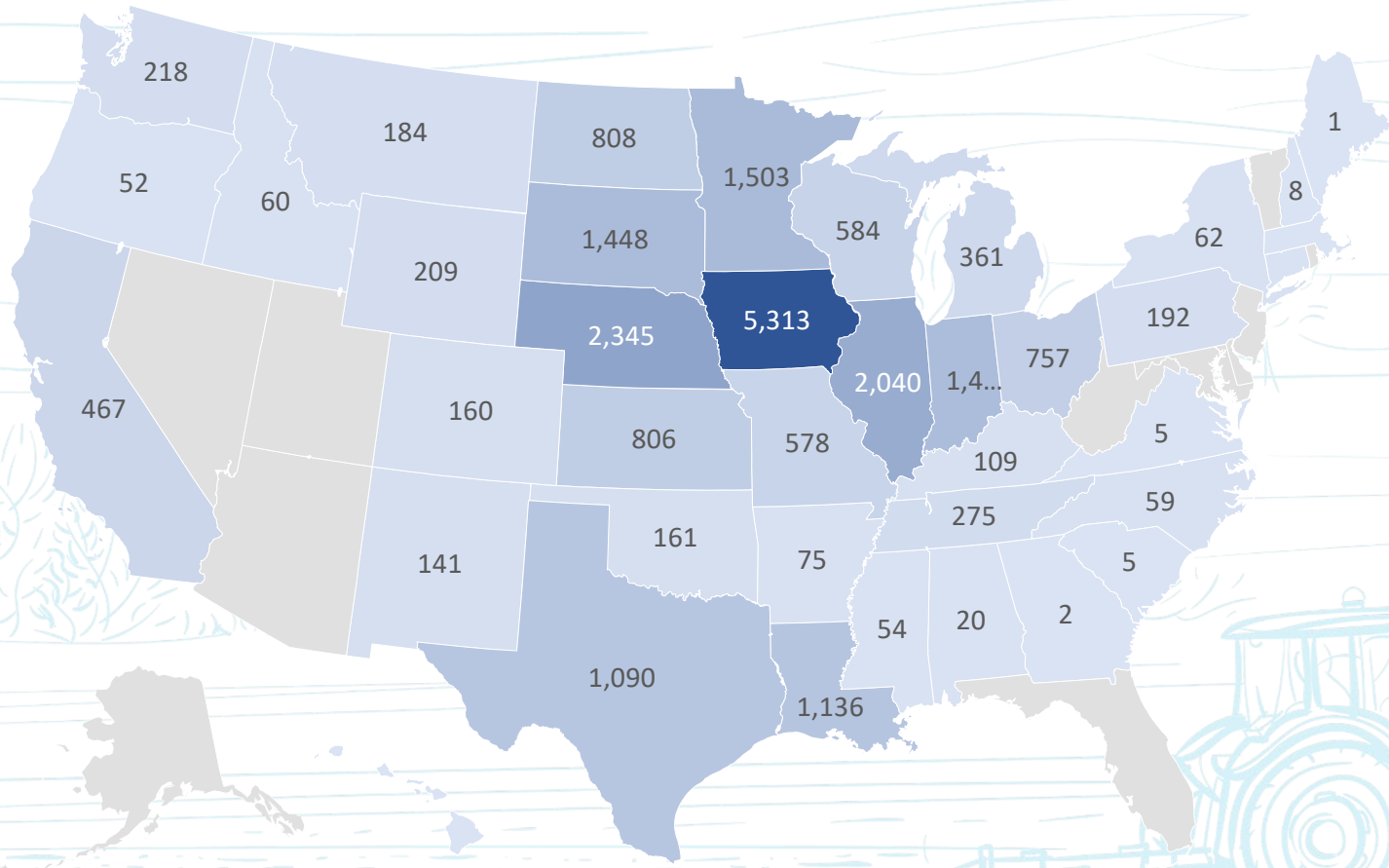


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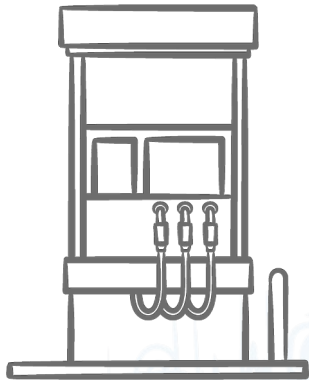


 — Net Zero Farmland — Biofuels Production

Total Renewable Fuels Production by State (1,000,000's gallons annually)



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Current Capacity
22.75 billion gallons

Renewable Fuels Required
SAF - 16 billion gallons
Renewable Diesel - 45 billion gallons

For Context

- 1 billion bushels of soybeans = 1.6 billion gallons of renewable diesel
- 24 billion bushels of soybeans are needed to fill the gap
- Current annual US production is ~4.5 billion bushels

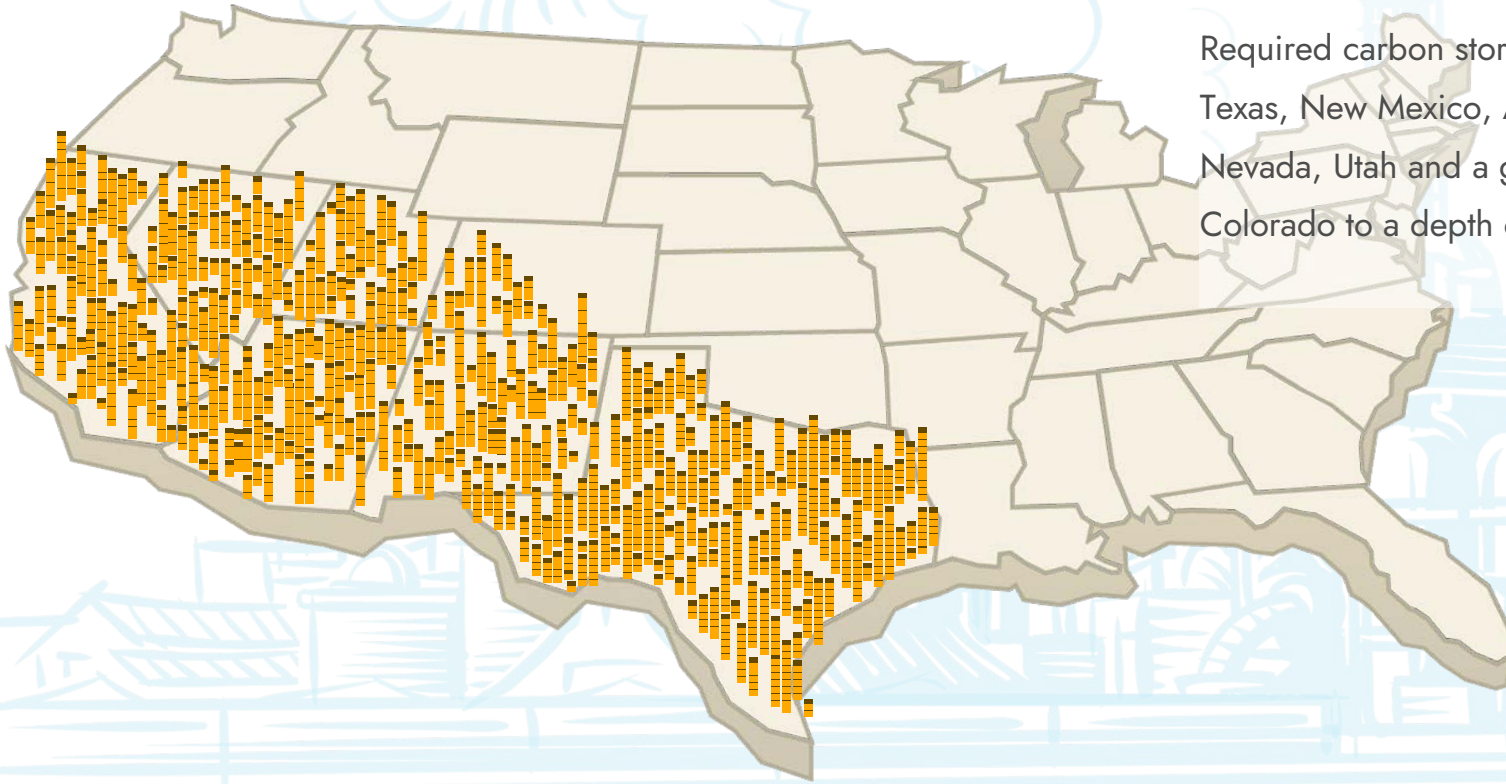




 — Carbon Storage

Carbon Storage

Required carbon storage would cover Texas, New Mexico, Arizona, California, Nevada, Utah and a good chunk of Colorado to a depth of **27 feet**





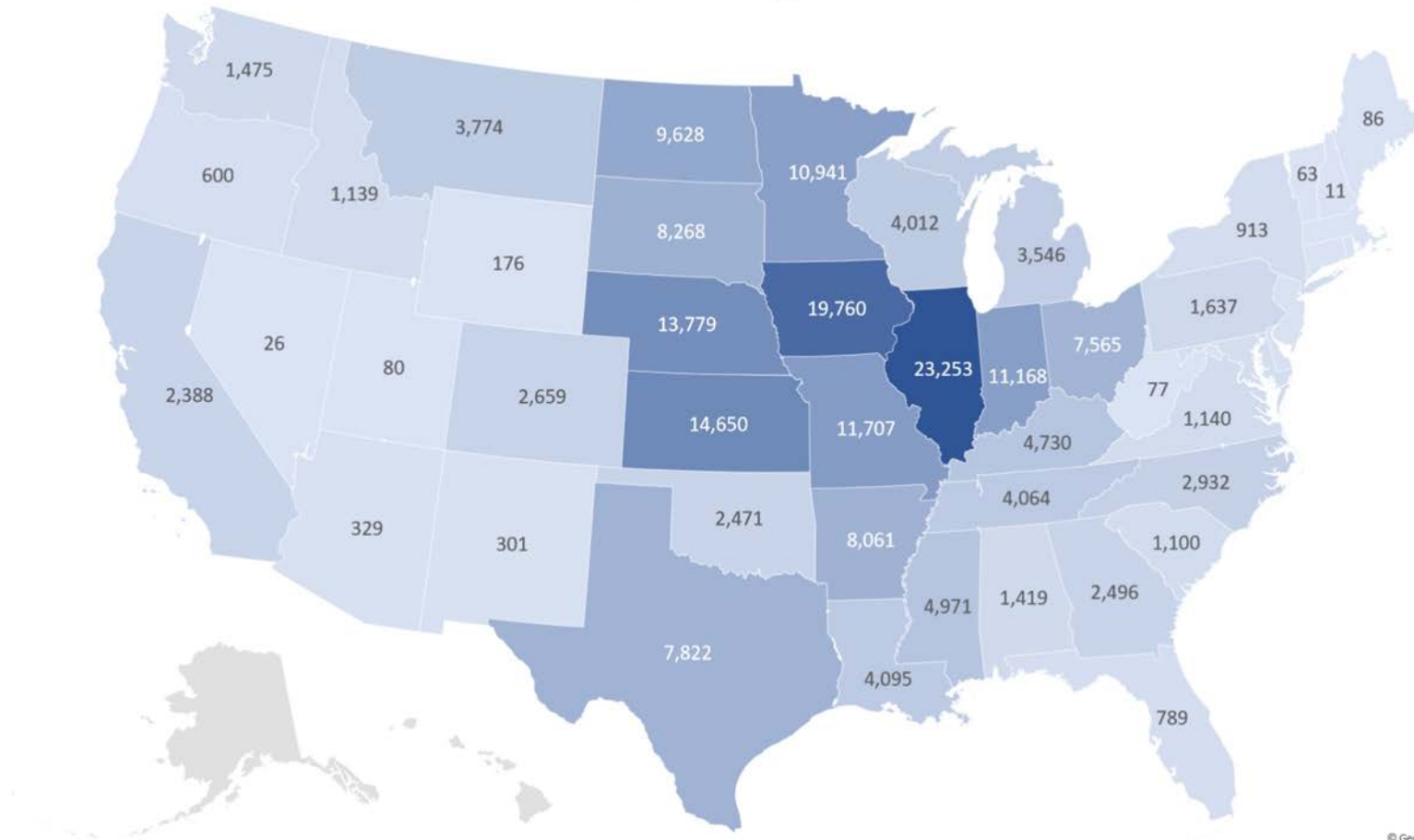
COMET-Farm

 NRCS  USDA  NREL  Colorado State University



 — Projecting Soil Carbon Storage

State Level Carbon Sequestration Potential - No Till & Cover Crops
(1000's tons CO₂e/yr)

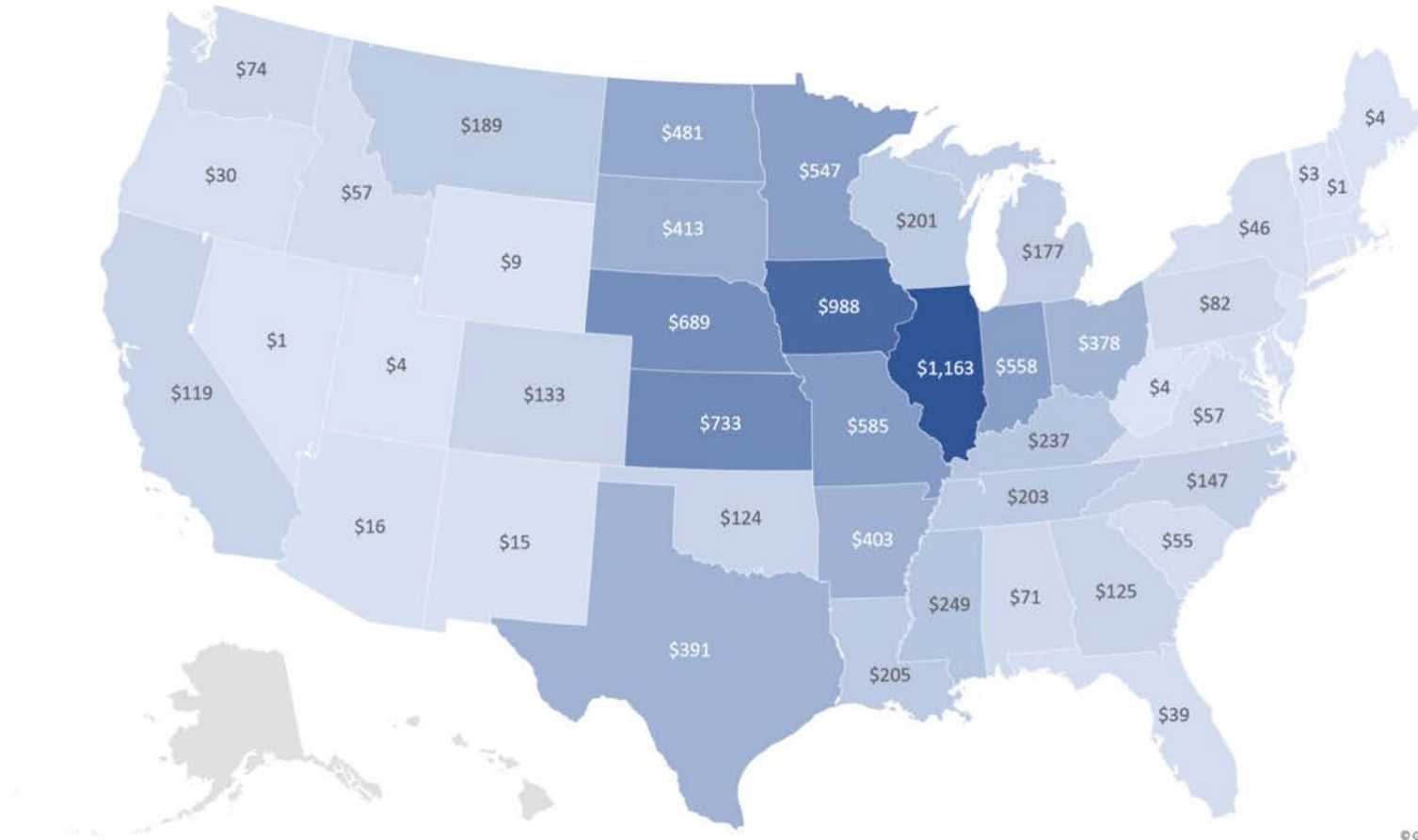


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— Soil Carbon Storage Potential by State

Carbon Revenue Stream at \$50/ton CO2e (\$1,000,000's)



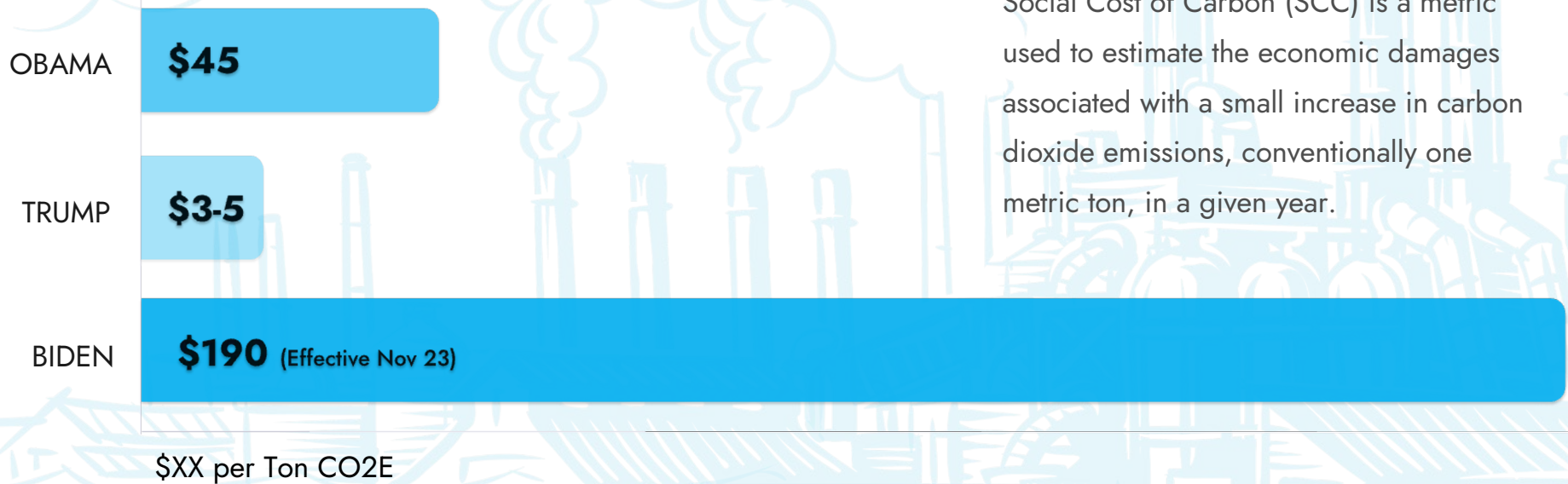
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— Soil Carbon Revenue Potential by State - \$50/ton

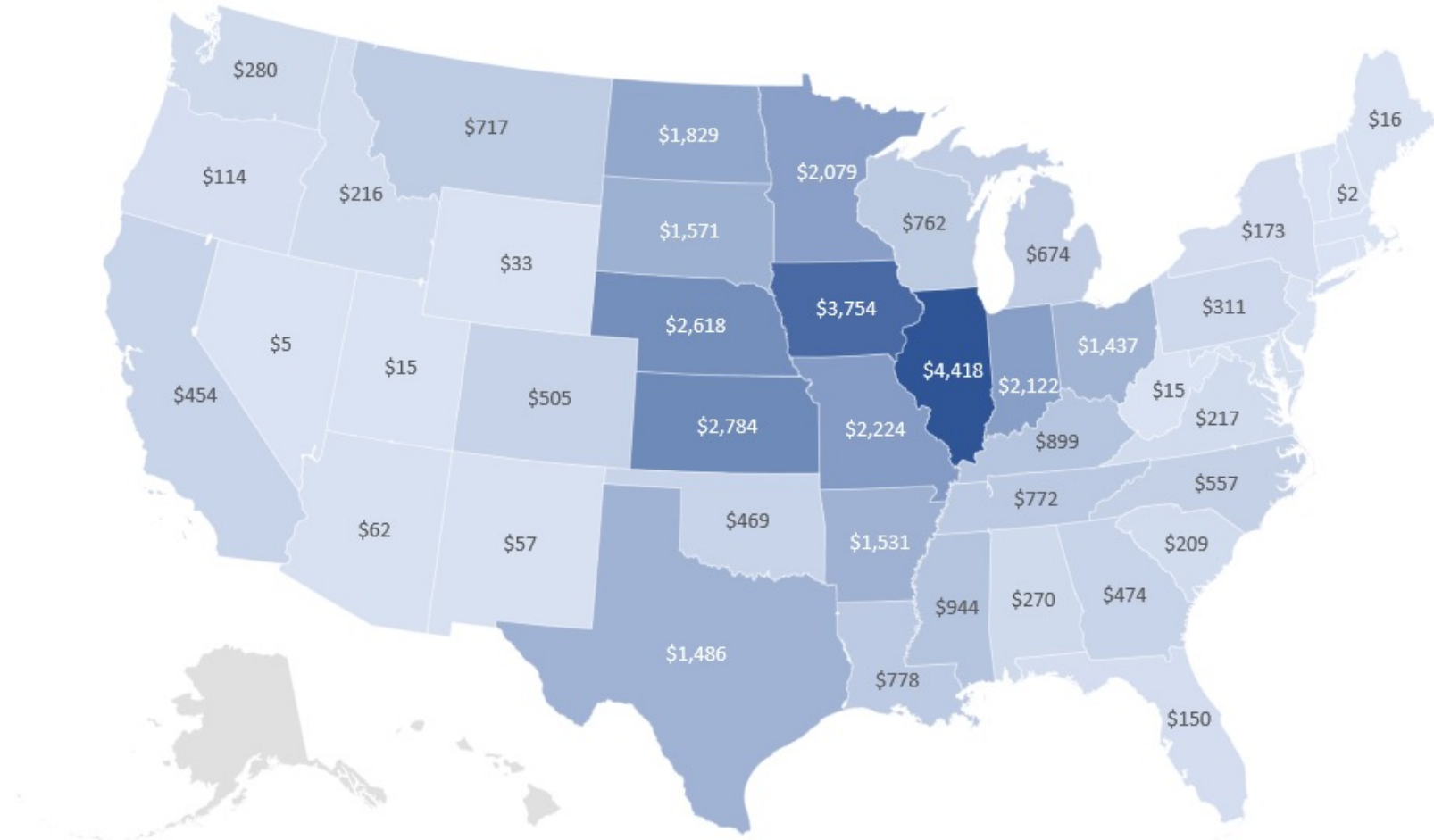
Social Cost of Carbon

Social Cost of Carbon (SCC) is a metric used to estimate the economic damages associated with a small increase in carbon dioxide emissions, conventionally one metric ton, in a given year.



— What is the Social Cost of Carbon (SCC)?

Carbon Revenue Stream at \$190/ton CO₂e (\$1,000,000's)



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— Soil Carbon Revenue Potential by State - \$190/ton

Net Zero in Farmland – *Putting it all together...*



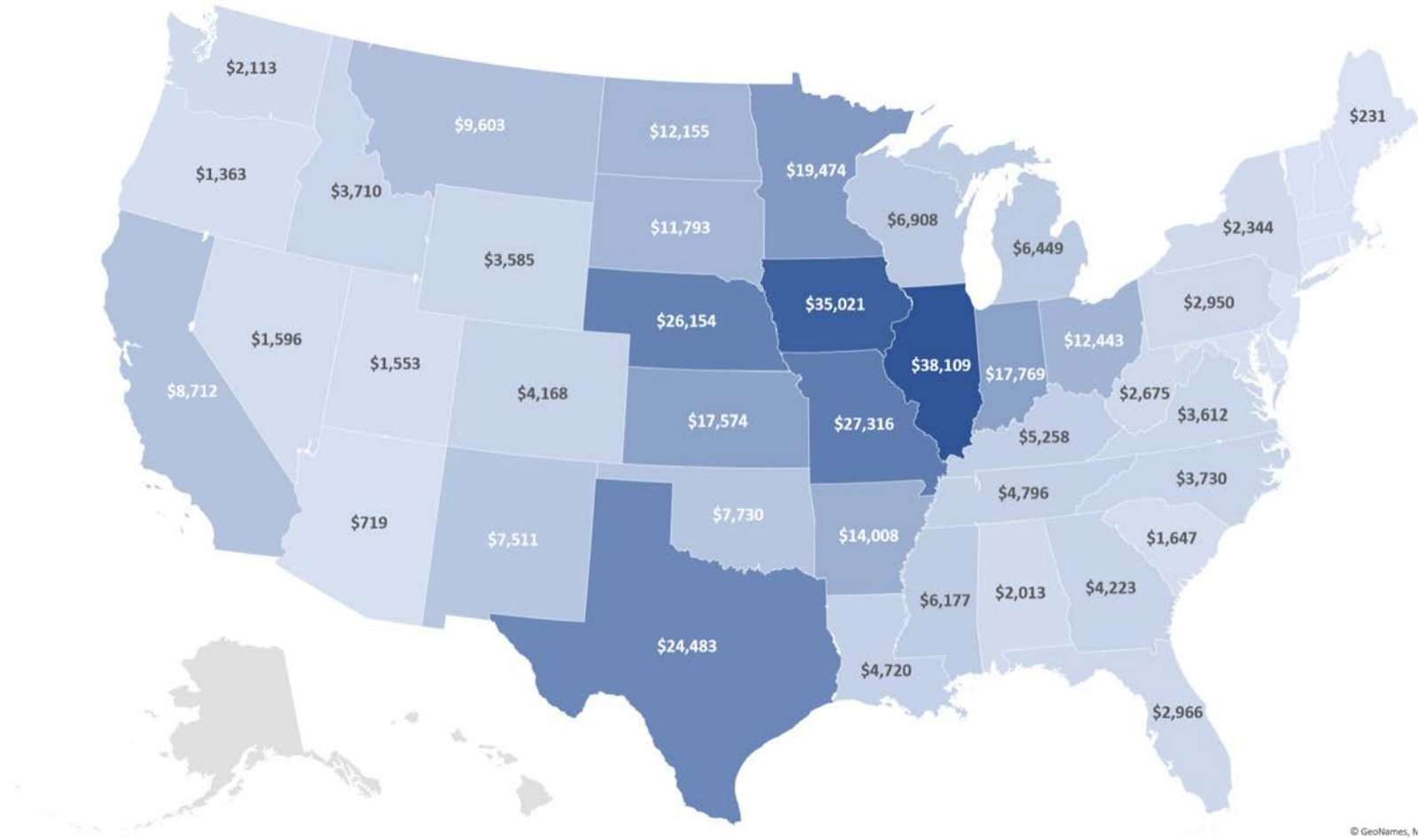
Low Carbon Energy
Transition



Carbon Storage



Combined Projected Land Value Impact in 2050 (\$1,000,000's)



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— Net Zero in Farmland — Combined **\$400B Impact** in Farmland Values



Thank You!

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