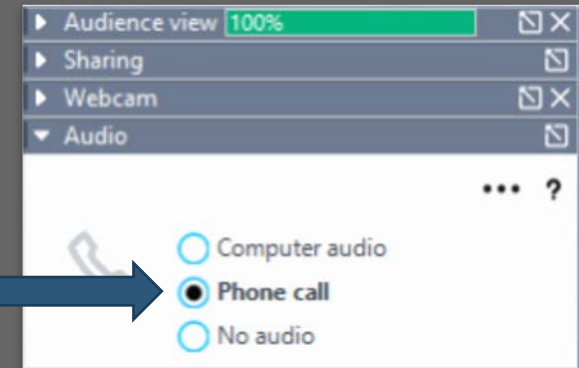


PANELISTS – PLEASE DIAL IN

- Using the phone for audio will help minimize lag, distortion, or other internet connectivity issues.
- Please turn off your computer's sound.

THANK YOU!





HOW CORPORATE RENEWABLE ENERGY PROCUREMENT CAN FUEL DECARBONIZATION, IF ONLY WE LET IT

MODERATOR:

Commissioner Ann Rendahl, Washington

PANELISTS:

Chairman Carrie Zalewski, Illinois Commerce Commission

Bryn Baker, Director, Policy Innovation, Renewable Energy Buyers Alliance

Jeff Riles, Global Energy Markets and Policy, Google

Mariah Kennedy, Head of Data Center Energy Strategy (Global), Microsoft

WHAT IS NARUC

- The National Association of Regulatory Utility Commissioners (NARUC) is a non-profit organization founded in 1889.
- Our Members are the state regulatory Commissioners in all 50 states & the territories. FERC & FCC Commissioners are also members. NARUC has Associate Members in over 20 other countries.
- NARUC member agencies regulate electricity, natural gas, telecommunications, and water utilities.

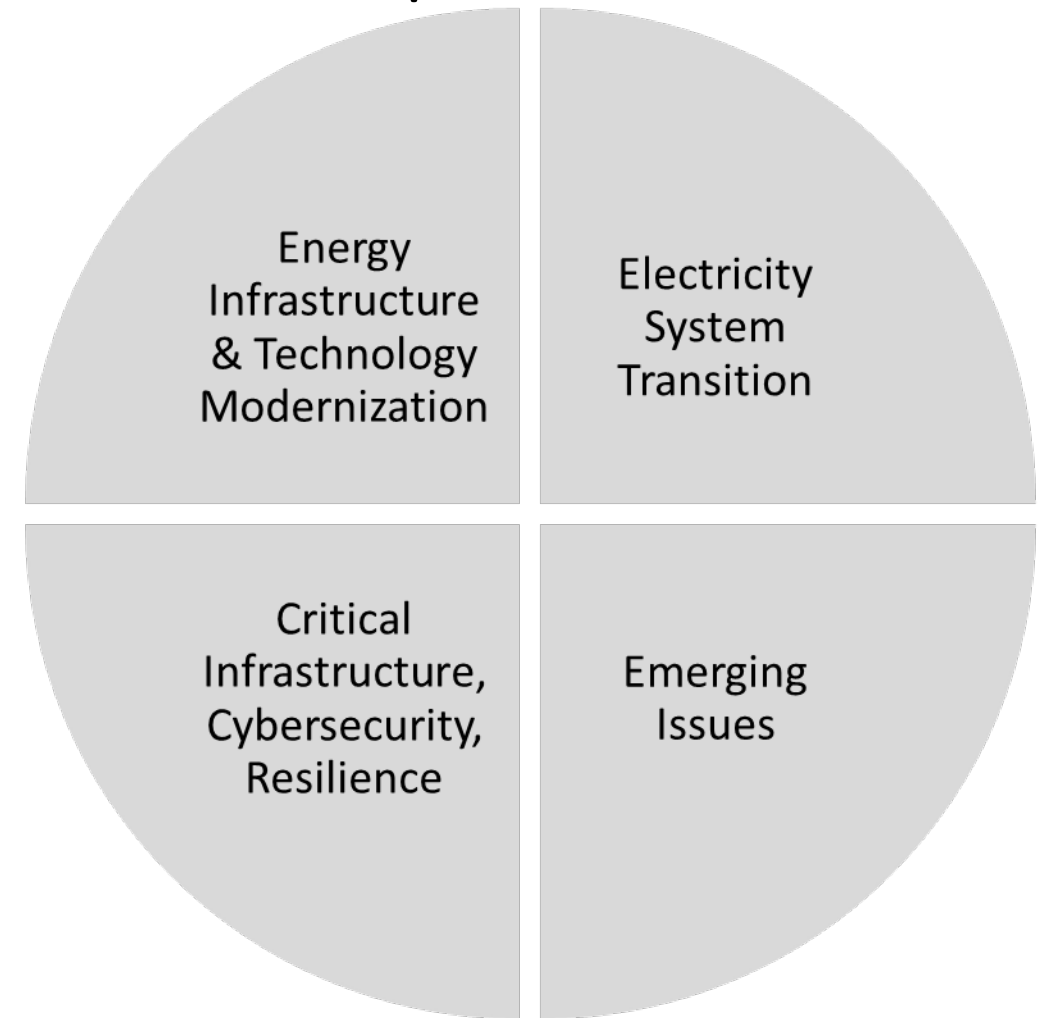


WHAT IS NARUC'S CENTER FOR PARTNERSHIPS AND INNOVATION?

- Grant-funded team dedicated to providing technical assistance to members.
- CPI identified emerging challenges and connects state commissions with expertise and strategies.
- CPI builds relationships, develops resources, and delivers trainings.



NARUC CPI Topical Areas



www.NARUC.org/CPI

WEBINAR LOGISTICS

- We're recording the webinar. It will be posted on the NARUC CPI webpage: <https://www.naruc.org/cpi-1/emerging-issues/innovation-webinars/>
- Because of the large number of participants, everyone is in *listen* mode only.
- **Please use the Question box to send us your questions** and comments any time during the webinar. You may want to direct your question to a specific panelist.
- The panelists will respond to questions typed in the Question box during moderated Q&A, following all presentations.





HOW CORPORATE RENEWABLE ENERGY PROCUREMENT CAN FUEL DECARBONIZATION, IF ONLY WE LET IT

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MODERATED Q&A

- All questions welcome!
 - Please use the Question box



~ 10 minutes

Today's Panelists



- **Chairman Carrie Zalewski**, Illinois Commerce Commission
- **Bryn Baker**, Director, Policy Innovation, Renewable Energy Buyers Alliance
- **Jeff Riles**, Global Energy Markets and Policy, Google
- **Mariah Kennedy**, Head of Data Center Energy Strategy (Global), Microsoft

Thank you for joining us today





The Illinois Renewable Procurement Process

Chairman Carrie Zalewski, Illinois Commerce Commission

“How Corporate Renewable Energy Procurement Can Fuel Decarbonization, If Only We Let It”

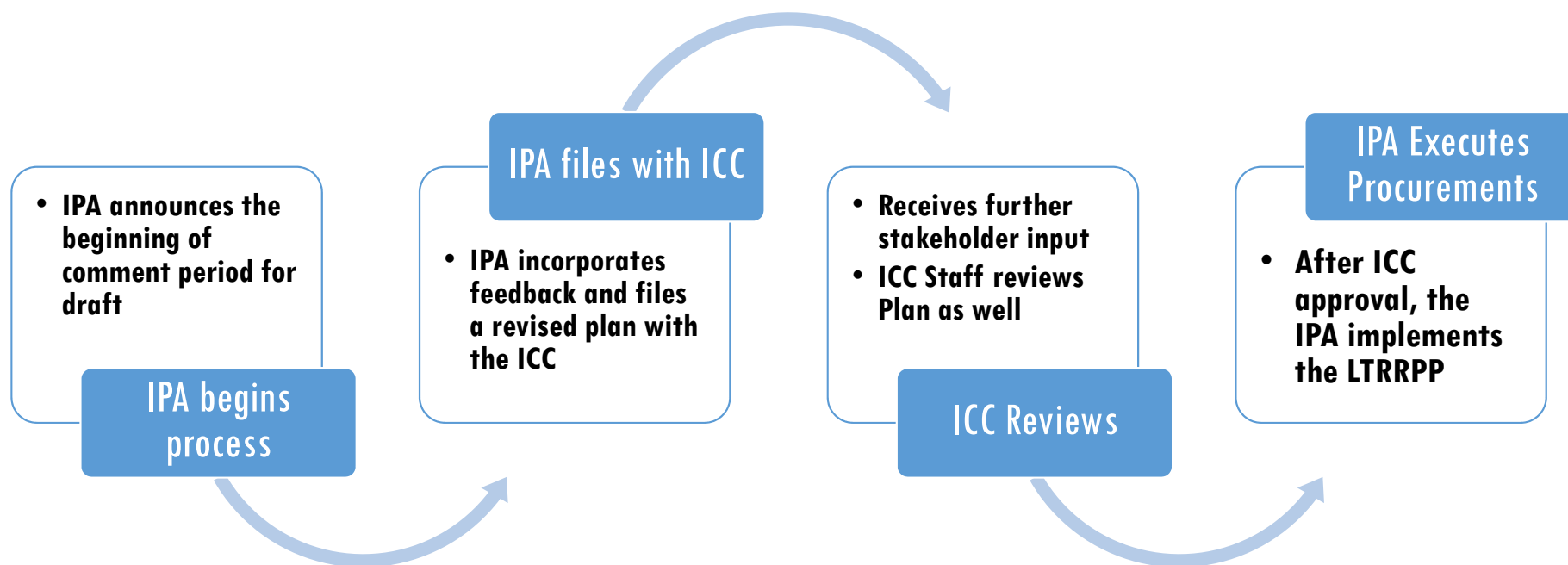


- Signed into Law December 2016
- Expanded both RPS and EE programs
- Established Zero Emission Standard, Distributed Generation, and Community Solar programs
- IPA and ICC work in conjunction

FEJA SET THE FRAMEWORK



The IPA Long Term Renewable Resources Procurement Plan (LTRRPP) Process





Illinois' ranking in the Corporate Clean Energy Procurement Index

CORPORATE CLEAN ENERGY PROCUREMENT INDEX: TOP 20 STATES





CARGILL AND THE PRAIRIE WOLF SOLAR PROJECT

- Cargill executed a Power Purchase Agreement (PPA) for Prairie Wolf Solar Project
- Prairie Wolf is a 200MW Solar Energy Project
- Prairie Wolf part of IPA's Initial Forward Procurement



ICC will address additional Regulatory Barriers

Interconnection Rules

- ICC currently in Rulemaking process to amend Parts 466/467
- Completion Date: December 2022

Net Metering

- ICC currently in heavily litigated docket
- Key issue is calculation of threshold percentage for DG penetration



Thank you!

Chairman Carrie Zalewski, Illinois Commerce Commission

www.icc.illinois.gov

How Corporate Renewable Energy Procurement Can Fuel Decarbonization, If Only We Let It



Bryn Baker,
Policy Innovation Director, REBA



NARUC Innovation Webinar
December 3rd, 2020



Objectives for this presentation:

WHO is REBA?

HOW are large energy buyers shaping the power sector?

WHAT does REBA's Renewable Energy Pathways Analysis tell us?

WHY do organized wholesale markets matter so much?

Our Mission: Who we are, and What we do

REBA is an alliance of large clean energy buyers, energy providers, service providers, and NGO partners, who are unlocking the marketplace for all non-residential energy consumers to lead a rapid transition to a cleaner, prosperous, zero-carbon energy future.

Capacity	Catalyze 60 GW of new, corporate backed renewables on the grid by 2025
Access	Avoid millions of tons of CO2 emissions
Buyers	Grow the buyer market to 50,000 buyers

REBA was established with a strong mandate from buyers

REBA Leadership Circle



Our Leadership Circle alone has:

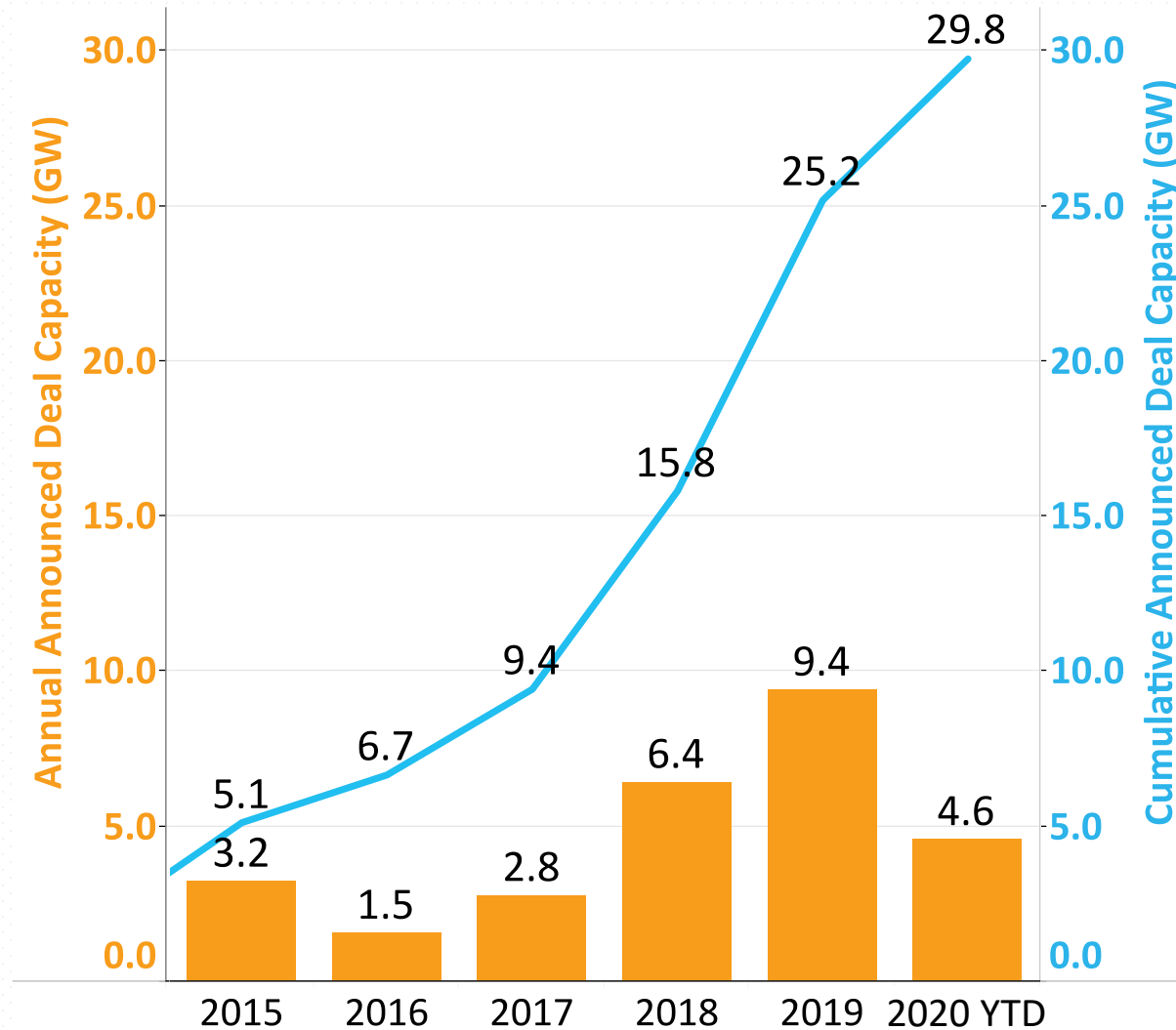
\$1.5 Trillion in revenues

8 Fortune 100 companies

12 Global 500 companies

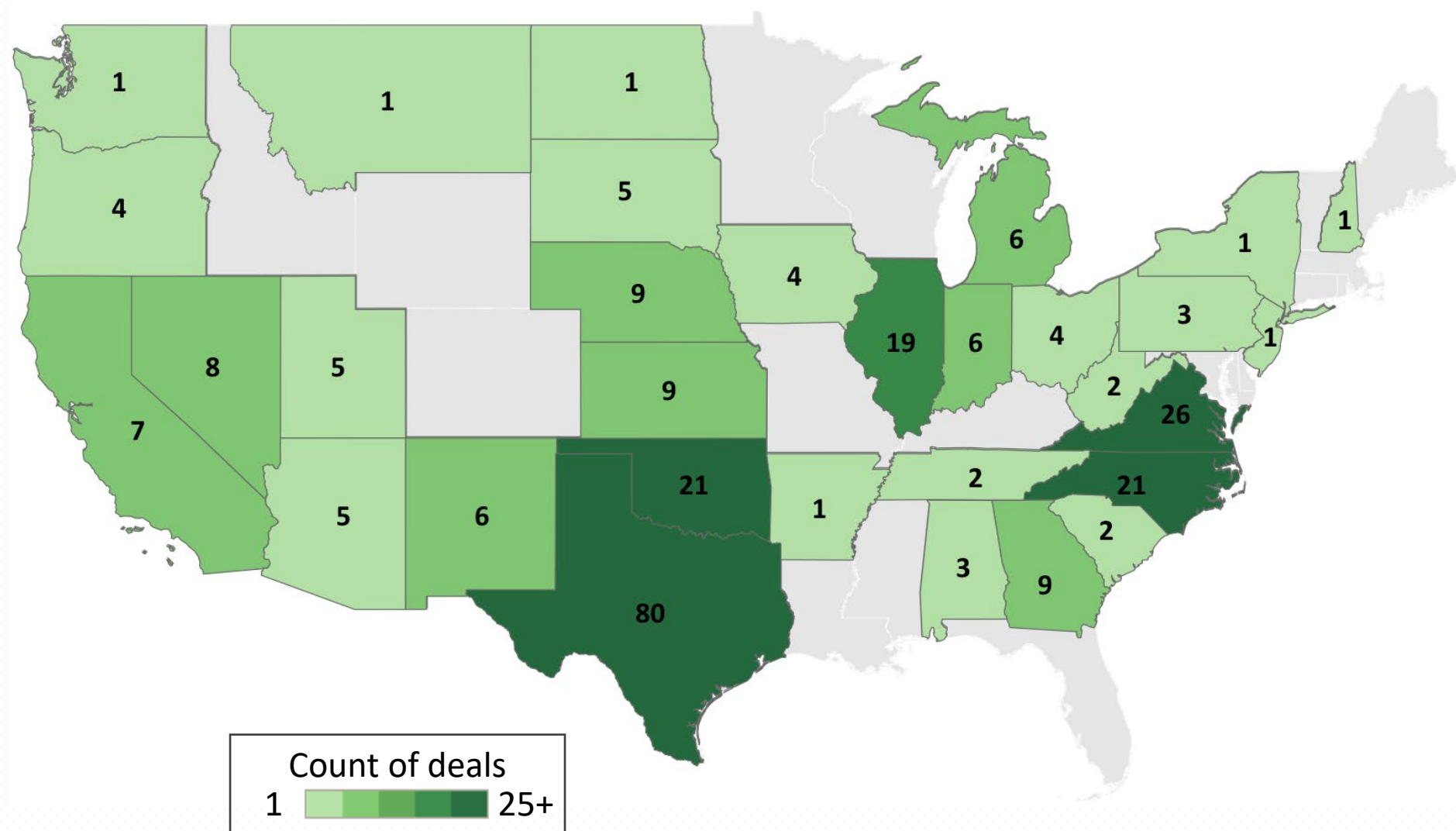
1 world's biggest company

State of the Market



Where are Corporates Signing Deals?

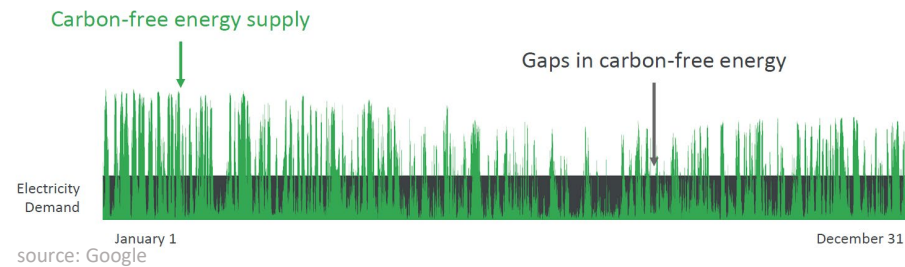
Thru May 2020



WHERE are companies going next with zero-carbon energy?

1

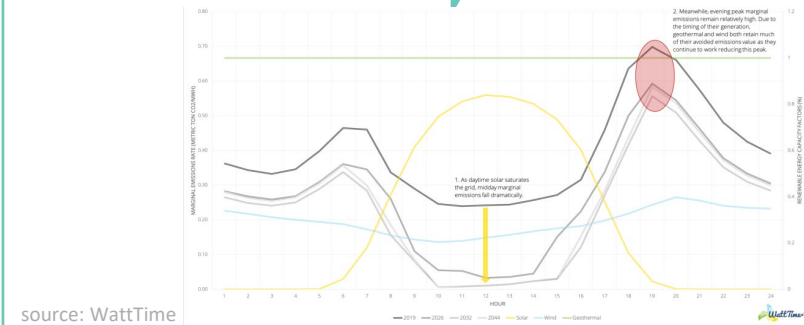
Transitioning from 100% RE goals to zero carbon all the time goals



2

New/Additional Projects

Material Impact Projects



3

Policy & Regulatory Engagement



4

More International Procurement



5

Focus on Supply Chain Partners



6

Impact Beyond Carbon





RENEWABLE ENERGY POLICY PATHWAYS REPORT

ANALYSIS OF STRATEGIES TO INCREASE
COMMERCIAL AND INDUSTRIAL CUSTOMER
ACCESS TO RENEWABLE ENERGY

In collaboration with

THE **Brattle** GROUP

REBA INSTITUTE PATHWAYS ANALYSIS

Policy Pathways – 3 Key Pathways

- **RPS Expansion**

- RPS is expanded 10-15% higher than current target
- Utility subscription programs are unchanged
- Did not model RPS beyond 50%

- **Utility Subscription Expansion**

- Utility subscription programs are expanded with RE development
- RE amount estimated to replace natural fossil fuel plant retirement (at 45 years, beyond any new RE needed for current RPS)

- **Supply Choice for all C&I customers**

- RE supply provided by new renewables
- Supply choice is introduced across all customer classes
- Historical retail adoption rate of C&I customers (32%) with potential to serve all C&I customers

Analytical Framework

- Modeled medium-term market and policy strategies to 2030 that are the most cost-effective, customer-driven, and expedient to unlock the marketplace for all non-residential energy buyers.
- Identified **8 sample states** to represent a diverse set of market, regulatory, & regional features
 - AZ, CA, CO, GA, MA, MN, NC, VA
- Analysis evaluated **technical potential**, rather than adoption, to identify opportunities without the uncertainty of modeling adoption for which little data exists.
- **Impact Metrics:**
 - *Capacity of new RE energy*
 - *Percent of C&I customer demand met*
 - *Cost of RE procurement*

Key Takeaways

1. Introducing supply choice potentially expands RE access up to 100% across the C&I sector AND lowers the cost of procurement by up to 11% compared to without choice.
2. Utility subscription programs in states where C&I customers cannot choose their suppliers, provide attractive near-term opportunities to improve C&I customer access to renewables, with modest price impacts.
3. Moderate RPS expansions beyond the *status quo* by 2030 have the potential to “green the grid” for all customers, but do not provide direct customer procurement options
4. Centrally Organized Wholesale Markets while not quantitatively analyzed in this study but the benefits are apparent as evidenced from previous studies and in the comparison of market structures

Key to providing:

- Greater customer access to options
- Billions in documented customer savings annually by operating markets more efficiently
- Greater RE integration

Report Findings

Summary Results for Policy Pathways Grouped by State Market Structure

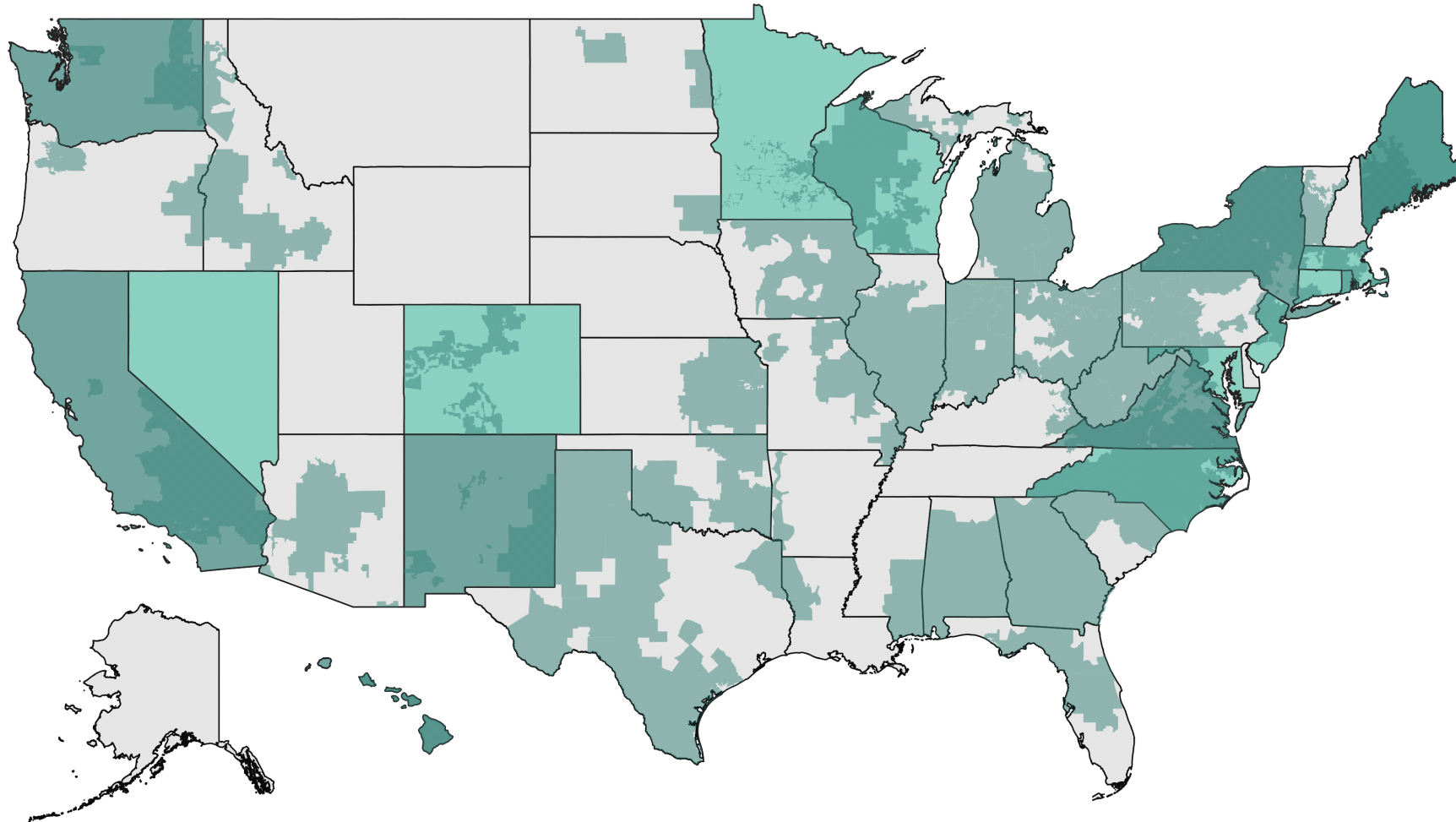
Policy Pathway	Technical Potential of New RE Capacity Relative to Status Quo (GW)	Technical Potential of C&I with RE Supply (% of Demand)	Potential Cost Ranges Relative to Status Quo (% Change)
States without Centrally Organized Wholesale Markets (AZ, CO, GA, NC) (Status Quo in 2030: 5 GW of New RE for all)			
Moderate RPS Expansion Above Status Quo (SQ)	up to 19 GW	up to 33%	-3% to 0%
Utility Subscription Expansion	up to 46 GW	up to 60%	-5% to +1%
Supply Choice Introduction	29 to 92 GW	43% to 100%	-11% to -1%
States with Centrally Organized Wholesale Markets (CA, MN, VA) (Status Quo in 2030: 20 GW of New RE for all)			
Moderate RPS Expansion (only MN and VA) Above SQ	up to 6 GW	up to 46%	-1% to +1%
Utility Subscription Expansion (only CA and MN)	up to 6 GW	up to 63%	0% to +2%
Supply Choice Introduction	19 to 45 GW	66% to 100%	-5% to -1%
States with Retail Choice (MA*) (Status Quo in 2030: 7 GW of New RE)			
Moderate RPS Expansion Above SQ	up to 3 GW	up to 59%	-0.3% to +1%
Retail Choice Enhancement (stranded costs N/A)	6 to 14 GW	61% to 100%	-12% to -11%

Most effective policy pathway varies by state as a result of different starting points in terms of existing market and regulatory structures, current portfolio of generation assets, utilities' willingness to support the interests of C&I customers, and the treatment of any potential stranded asset costs



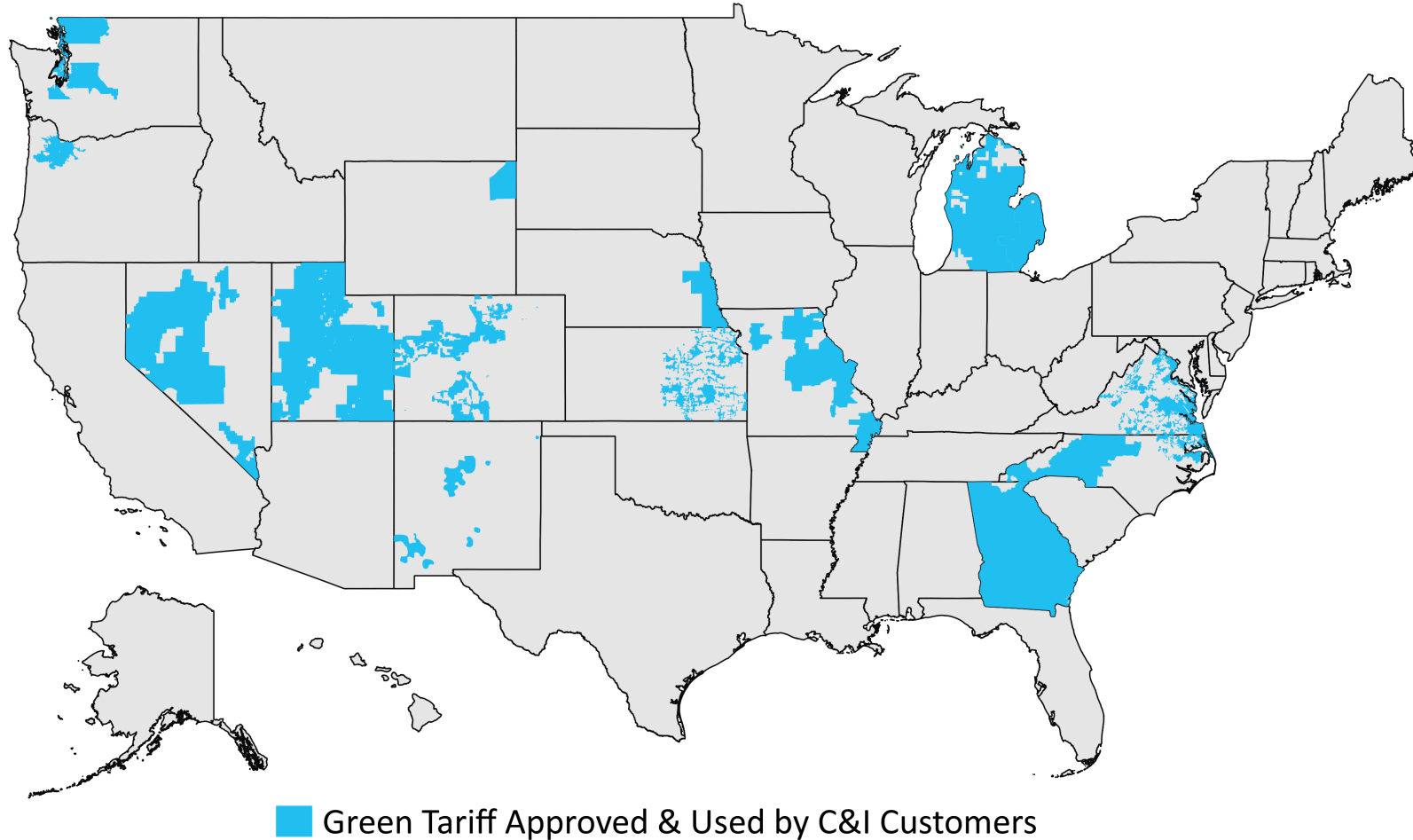
MAPPING THE PATHWAYS

Pathway 1: Where is the Grid Greening via RPS/ CES and utility commitments?



- State 100% RPS/CES
- State 100% Carbon-Free Executive Order or Goal
- Utility 80%-100% Decarbonization Commitments

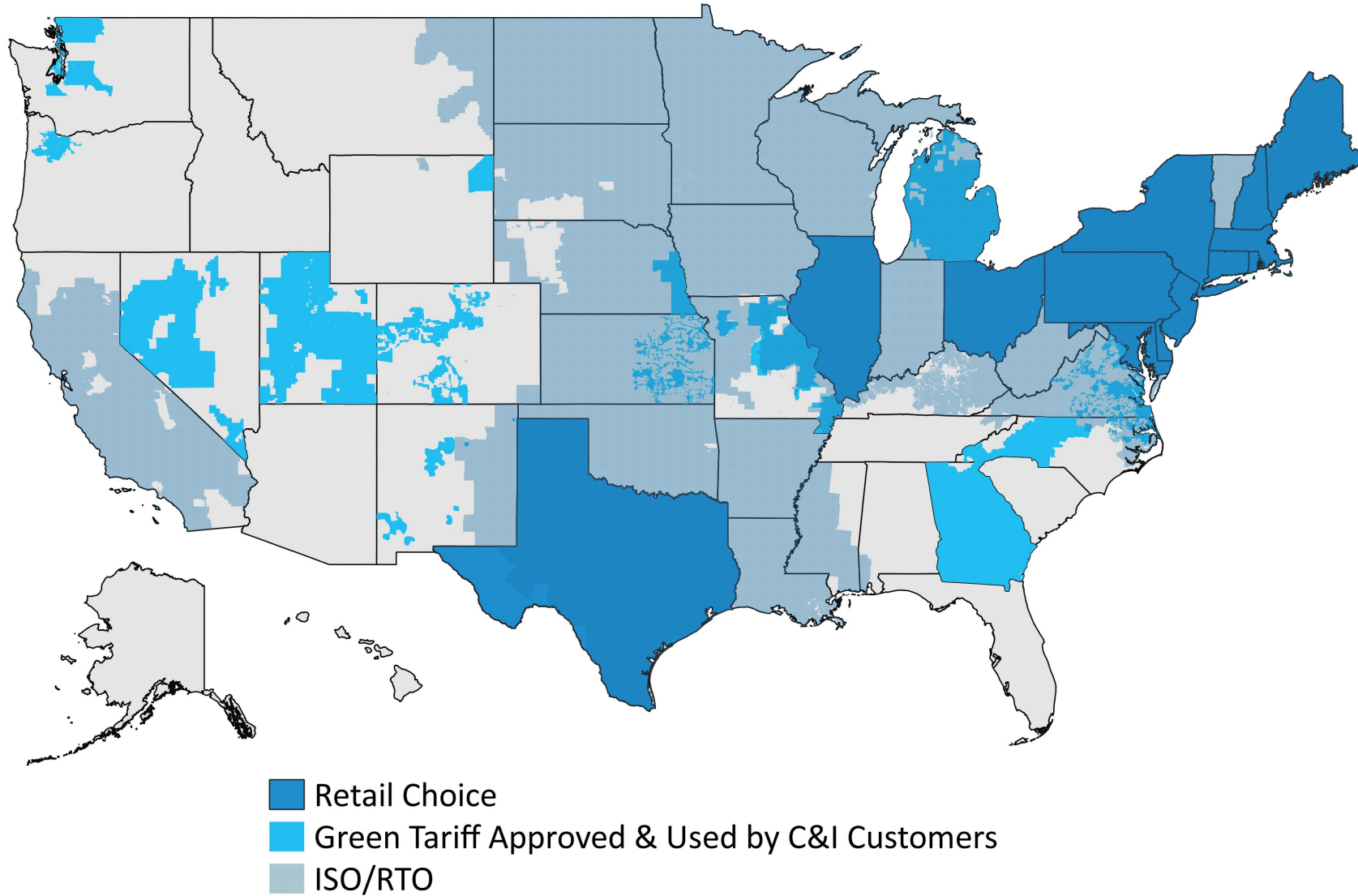
Pathway 2: Utility Offerings



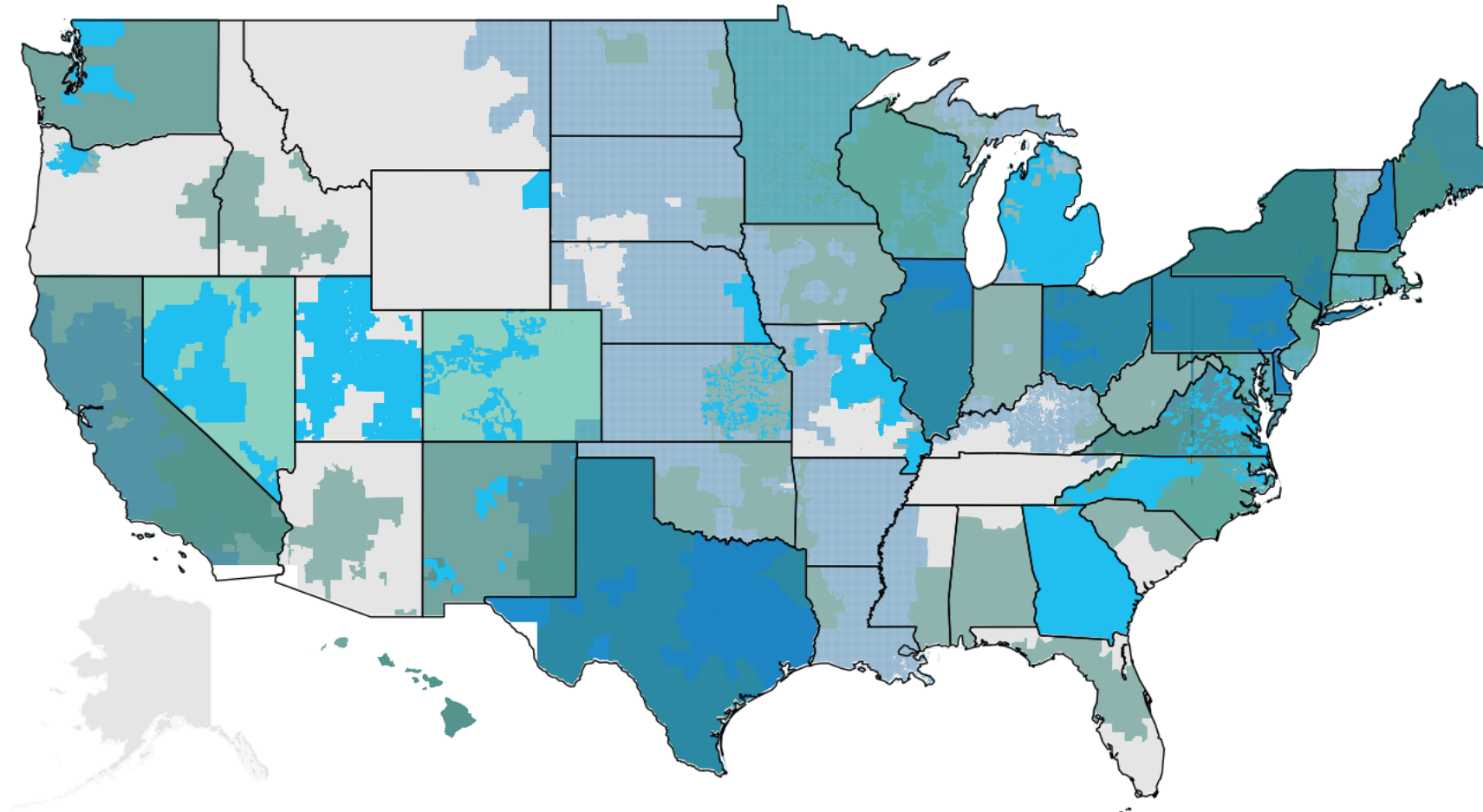
Narrowing deployed green tariffs to utility service territories further highlights their limited availability

Data from REBA Green Tariff tracking and only includes deals that involve build of new generation and corporate commitments

Pathway 3: Increase and Improve Customer Options



Maybe we need all of the above . . .



Energy Buyer Organized Wholesale Market Design Principles



Theme I: Unlock Competition to Catalyze Clean Energy

1. An open and level playing field
2. A role for demand participation
3. Services that provide actual value to customers



Theme II: Safeguard Market Integrity

4. Independent & responsive grid governance, management, & operation
5. Transparency
6. Broad stakeholder engagement and representation



Theme III: Design to scale to the future

7. Largest efficient operational scale available
8. Opportunity and choice for customers
9. Respect for state and federal public policy
10. Predictable investment decisions

Thank You



FIND OUT MORE:



www.rebuyers.org



[@renewablebuyers](https://twitter.com/renewablebuyers)



communications@rebuyers.com



[linkedin.com/renewableenergybuyersalliance](https://www.linkedin.com/renewableenergybuyersalliance)



Google

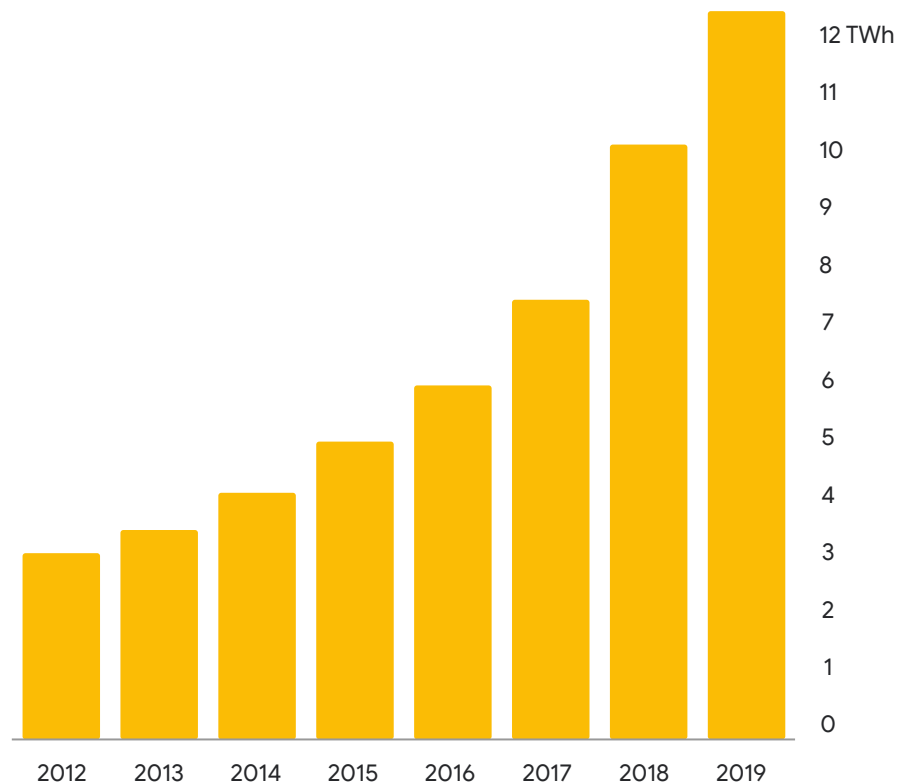
Energy strategy at Google

Products with >1 billion users



Google's annual electricity consumption

Demand for our services is growing every year, driving continued growth in our energy use



● Total electricity consumption (TWh)

This Google data center campus is the size of **235** football fields



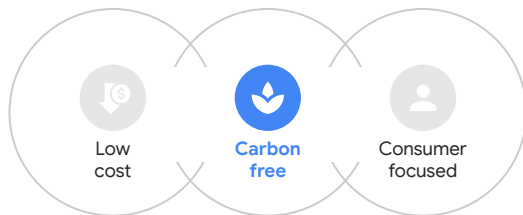
Electricity fuels data centers

Reliable electricity supply enables us to deliver Google services without interruption



What we're doing

24/7 Clean Energy



Google

Google's Energy Journey

Carbon Neutrality

(Offsetting emissions)



Since 2007

Google has purchased enough high-quality carbon offsets and renewable energy to bring our net operational emissions to zero.

100% Renewable Energy

(Reducing emissions)



Since 2017

Google has matched its global, annual electricity use with wind and solar purchases. However, our facilities still rely on carbon-based power in some places and times.

24/7 Carbon-free Energy

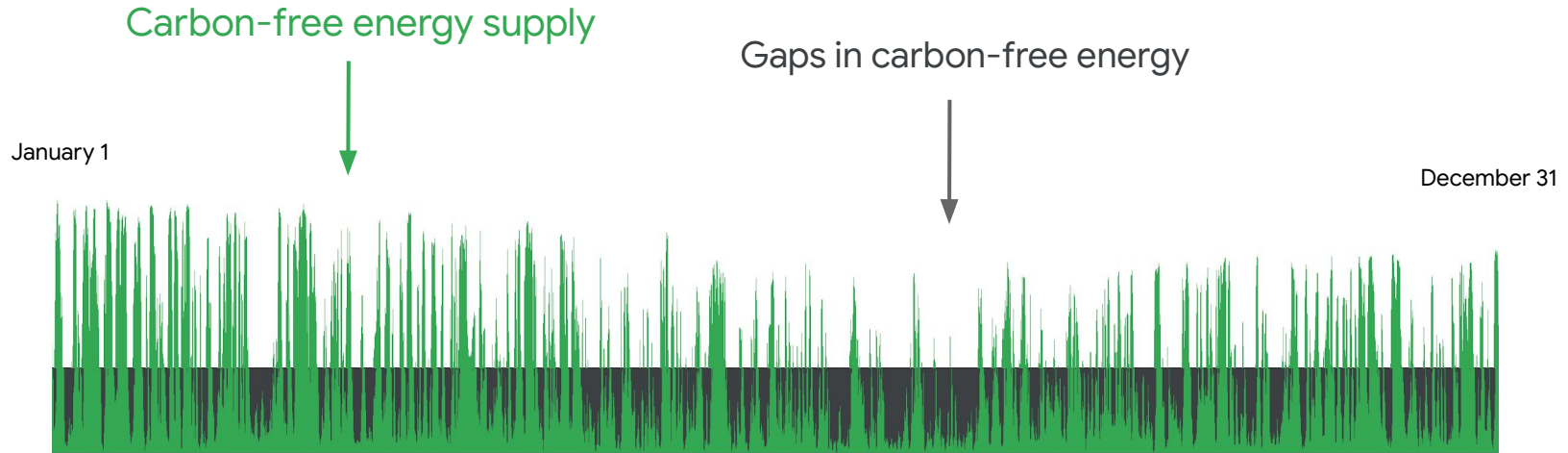
(Eliminating emissions)



By 2030

Google intends to match its operational electricity use with nearby (on the same regional grid) carbon-free energy sources in every hour of every year.

Hourly carbon-free energy performance at an example data center



Iowa data center hour by hour (2018)

Hourly carbon clocks for a September day

100% match with
carbon-free energy



0% match with
carbon-free energy

How to read clocks (example)



Oregon
89%



Iowa
78%



Oklahoma
96%



Tennessee
55%



Alabama
55%



Virginia
41%



North Carolina
66%



South Carolina
19%



Georgia
26%



Netherlands
61%



Finland
77%



Ireland
42%



Belgium
68%



Taiwan
19%



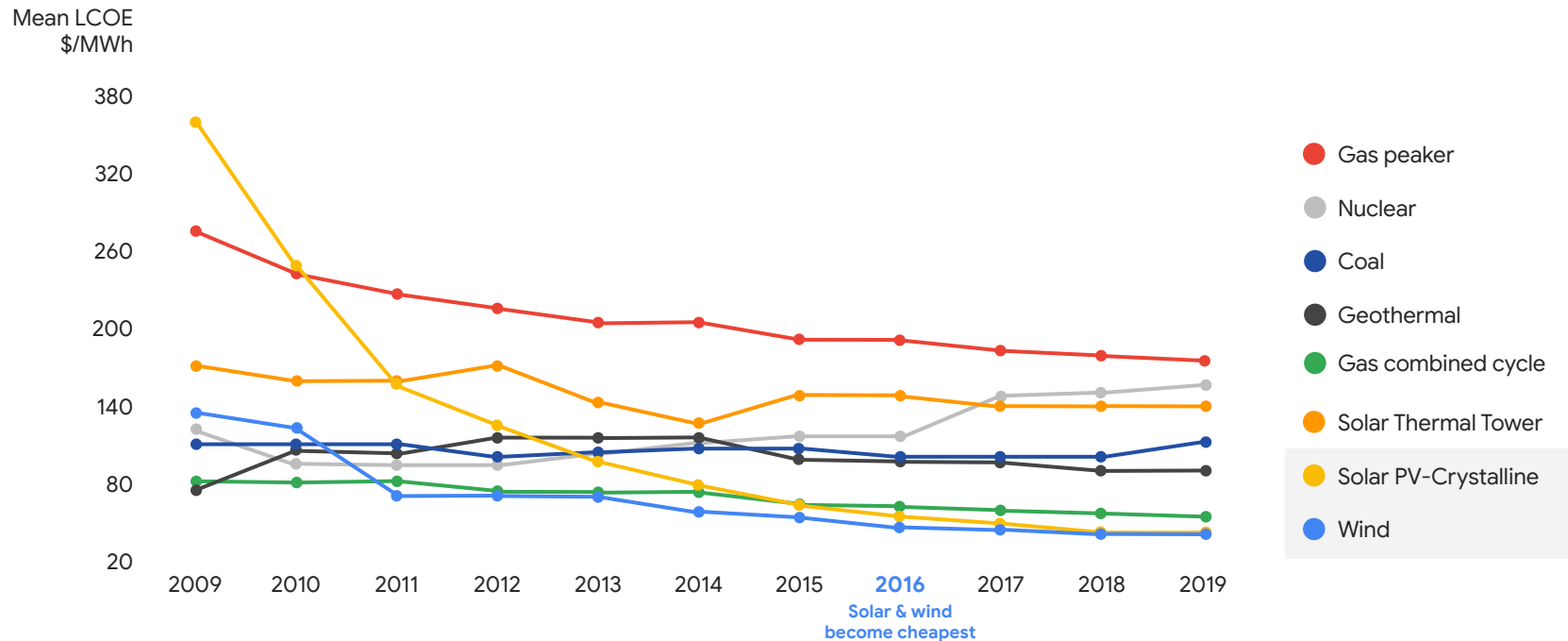
Singapore
3%




Chile
63%



Renewables are more cost effective than ever



An aerial photograph of a large wind farm situated on rolling green hills. Numerous white wind turbines are scattered across the landscape, which is crisscrossed by winding roads and paths. The terrain is lush and green, with some areas appearing darker, possibly due to shadows or different vegetation. The perspective is from a high angle, looking down on the hills.

Google is the world's
largest corporate
purchaser of
renewable energy

Google

Actual: every hour of electricity use at Iowa data center

PPAs have had a transformative impact on greening our energy profile

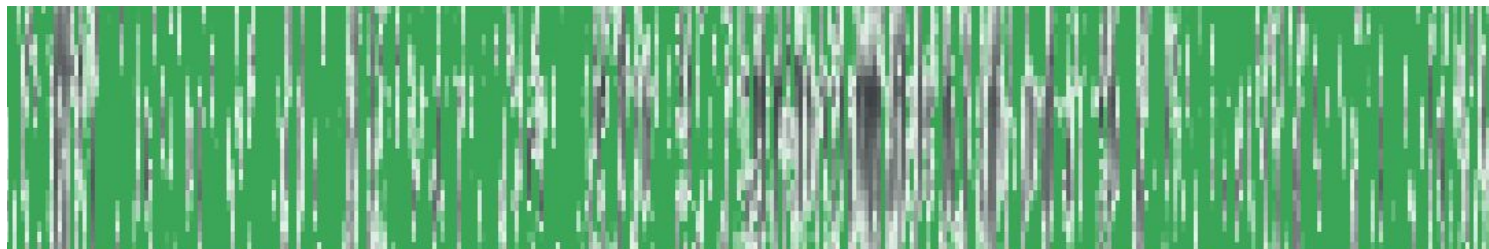
Actual (with Google PPAs)

January 1

74% carbon-free energy

December 31

Midnight
Morning
Noon
Afternoon
Evening



0% match with
carbon-free energy

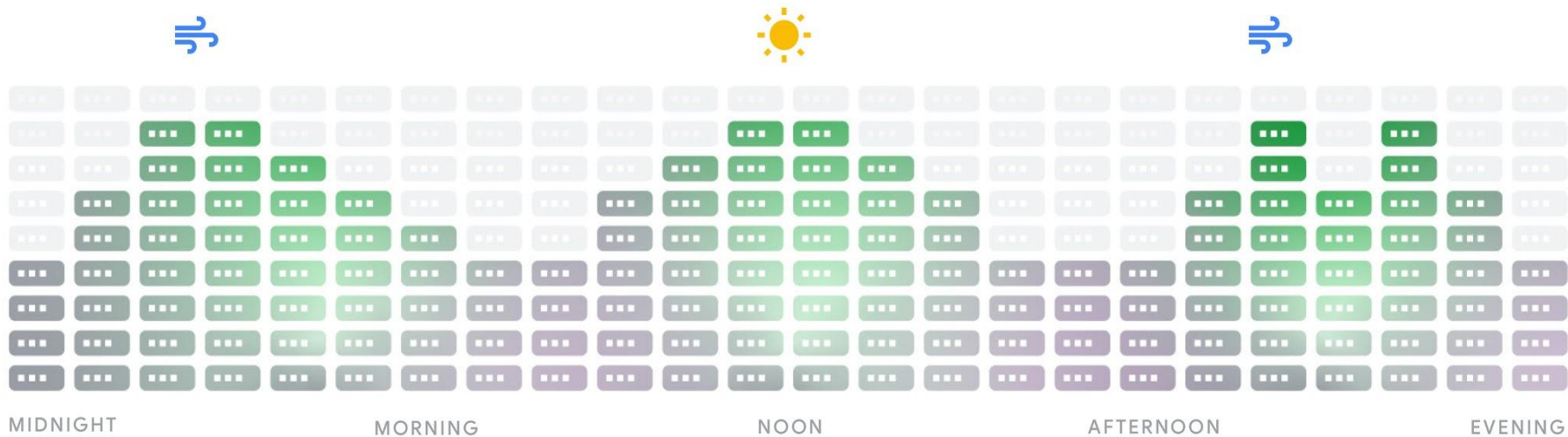


100% match with
carbon-free energy

FIG. 7

Aligning compute load with carbon-free energy

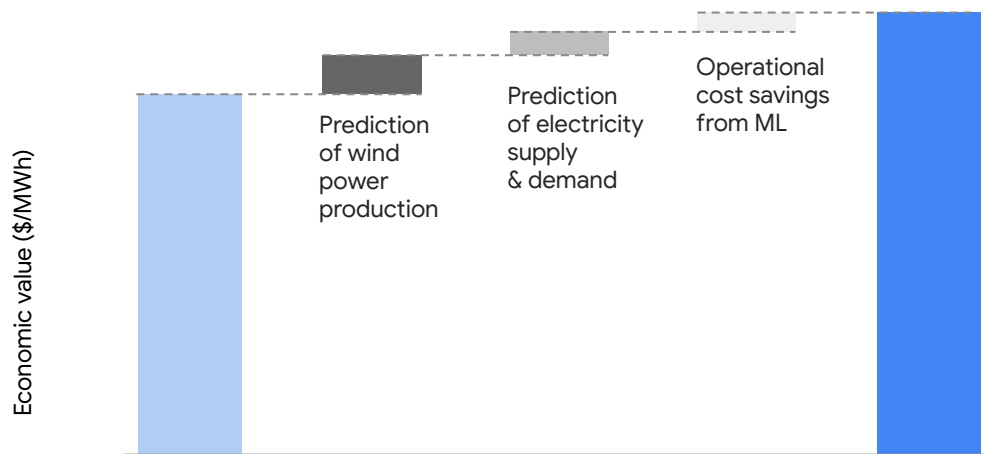
Google's carbon intelligent computing platform shifts flexible loads to times when wind and solar are abundant on the grid.



Machine learning

Increasing the
value of wind
energy by **20%**

- Typical wind farm
- Wind farm using ML



Advancing Energy Technology Innovation

Existing variable renewables

Solar

Wind

Next-gen technologies

Carbon capture and storage

Demand optimization

Low-cost / long-duration energy storage

Firm carbon-free resources

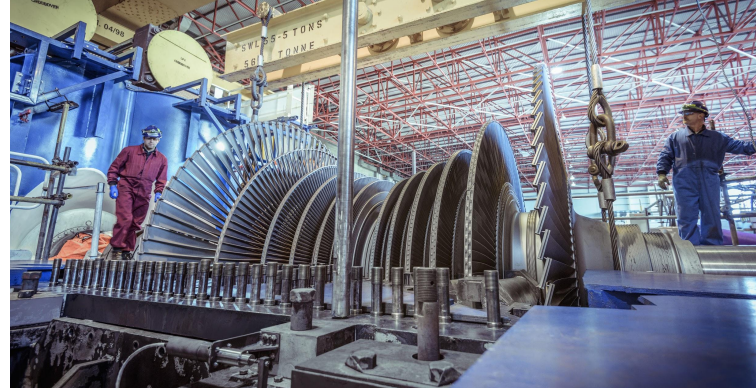
Carbon-neutral hydrogen

Geothermal

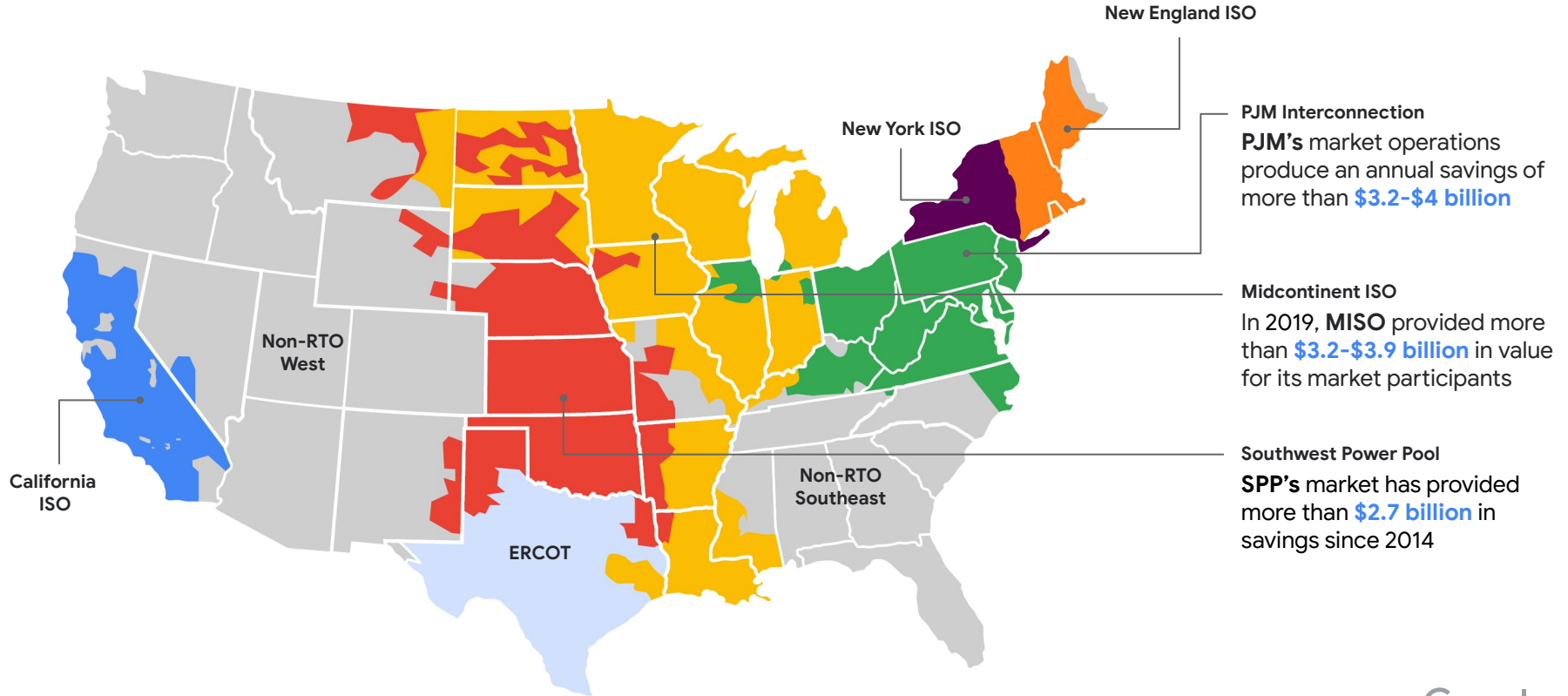
Low-impact biomass

Low-impact hydro

Nuclear



Competitive power markets help consumers



The Economic impact of 24/7 Carbon-Free Energy

- Our efforts to move toward 24/7 carbon-free energy will create more than 10,000 clean energy jobs globally by 2025
- Grid decarbonization will catalyze jobs and lower costs*:
 - **13% lower** electricity costs
 - **\$1.2 trillion avoided** health and environmental costs
 - **500K additional jobs** every year

*Source: [2035 Electric Decarbonization Modeling Study](#), UC Berkeley Goldman School of Public Policy. Study modeled 90% decarbonization of the electricity sector nationally by 2035.





Microsoft's Sustainability Commitments

Mariah Kennedy



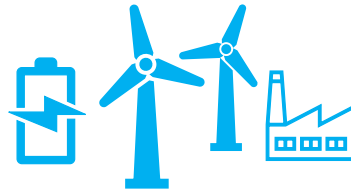
Overview:

- 1) Our engagement in the energy system
- 2) Our sustainability targets
- 3) Avenues to support economic and environmental efficiencies & environmental justice

Microsoft Three Identities in Energy Space



Microsoft is a **large customer**, with stable, resilient load and a high average load factor

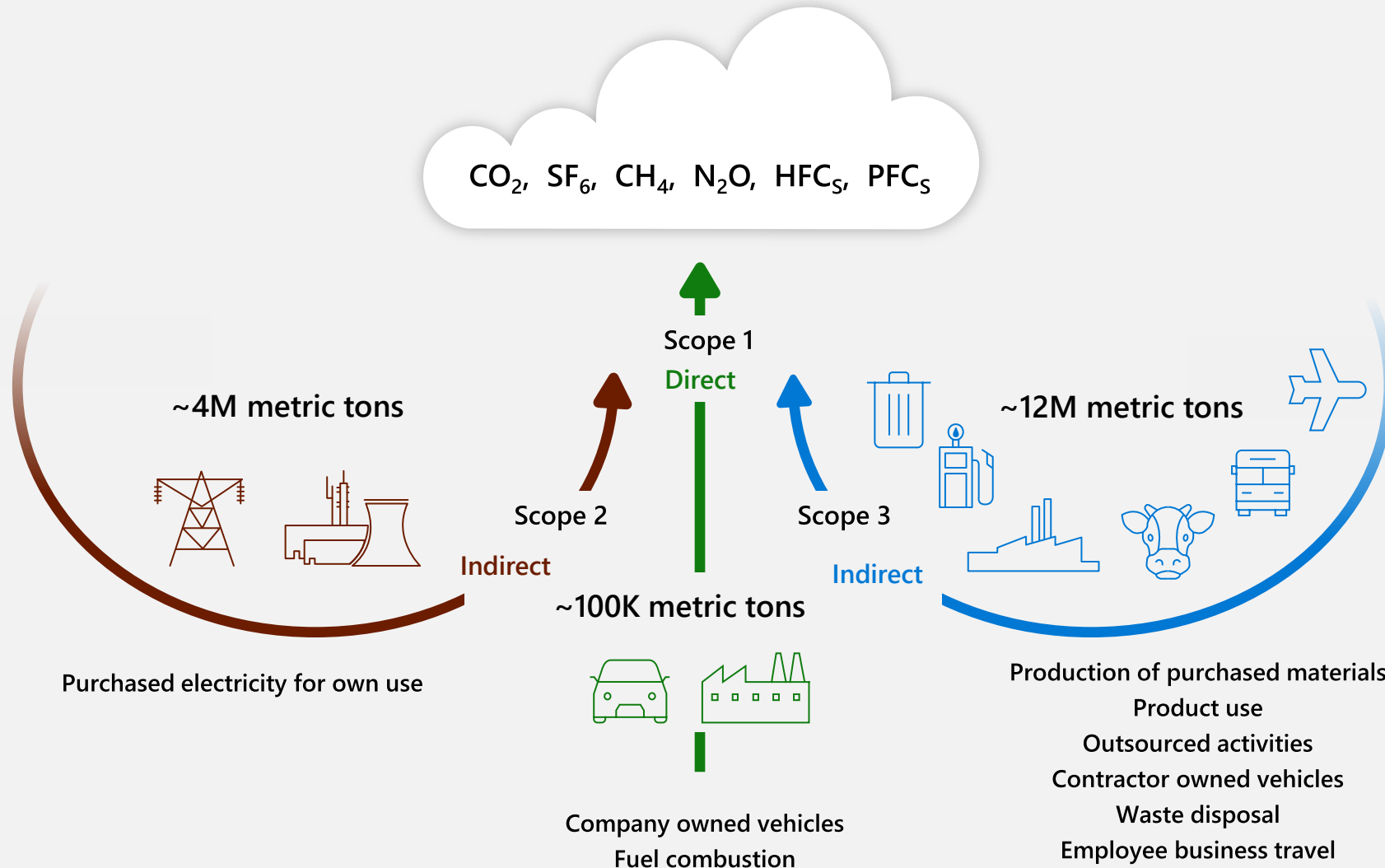


Microsoft is **supplier/renewable off-taker** – we have renewable PPAs, maintain battery storage and MW for MW backup generation



Microsoft is a **technology and solutions provider** with services that can increase transparency and enhance operations

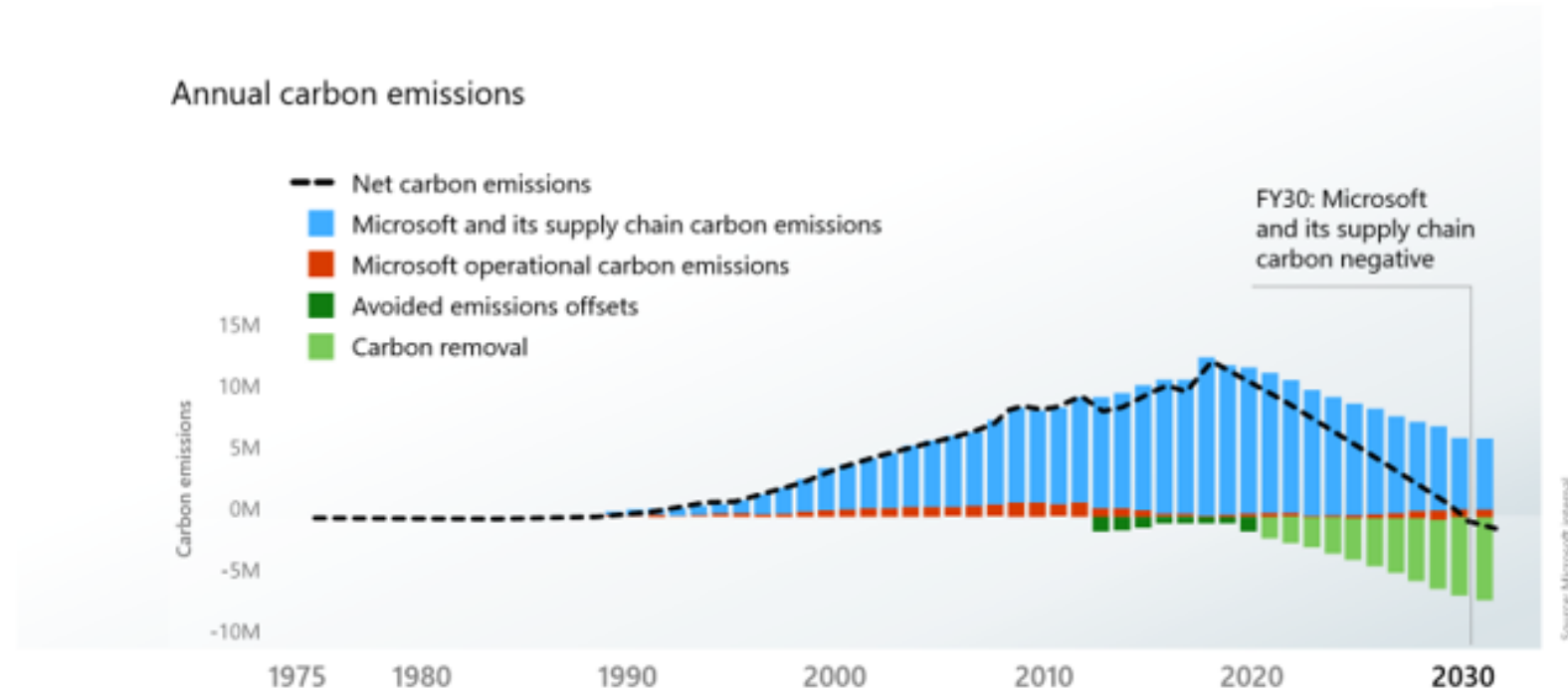
Microsoft's carbon emissions



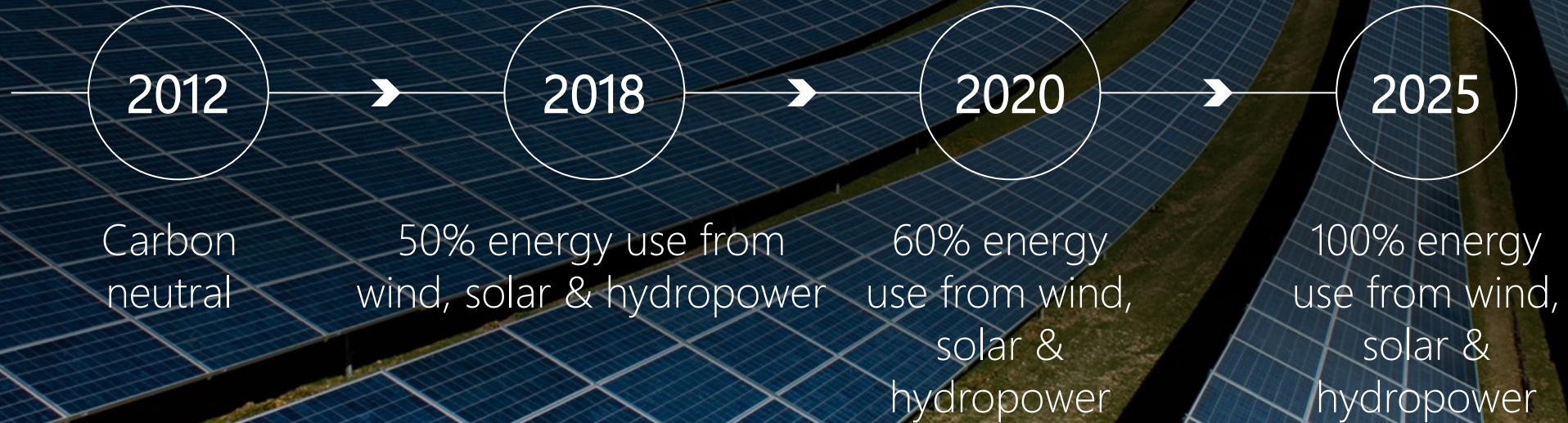
Microsoft's path to carbon negative by 2030

"It won't be easy for Microsoft to become carbon negative by 2030. But we believe it's the right goal. And with the right commitment, it's an achievable goal. This is a bold bet — a moonshot — for Microsoft. And it will need to become a moonshot for the world."

- Brad Smith, Microsoft President

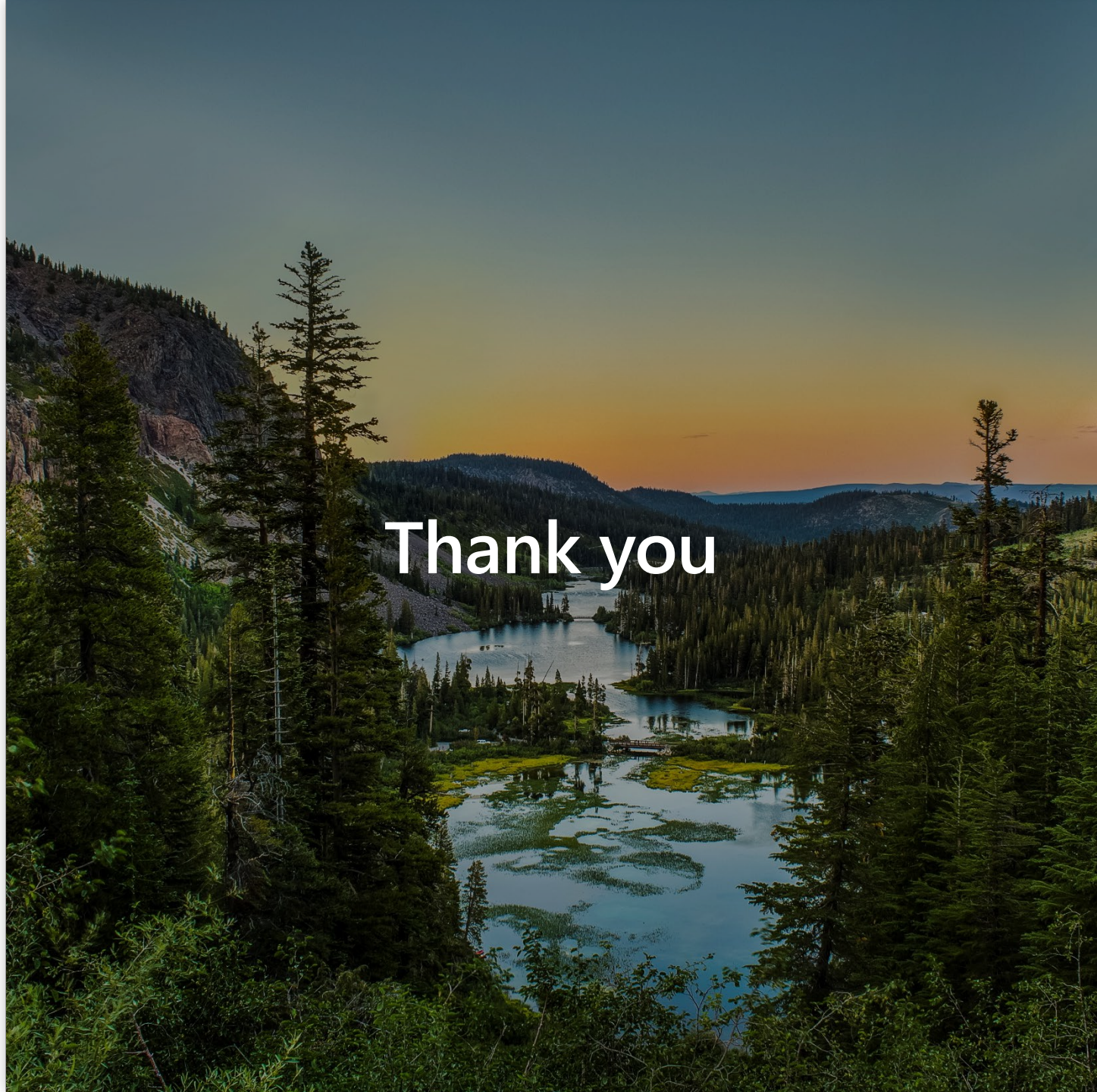


Commitment to sustainability





Thank you



NARUC Innovation Webinar series



Hosted one Thursday each month from 3:00 p.m. to 4:00 p.m. ET

- **Understanding and Unlocking the Potential of Cloud Computing and Artificial Intelligence to Improve Utility Service**

January 21, 2021 | 3:00 – 4:00 pm Eastern

Register at: <https://www.naruc.org/cpi-1/emerging-issues/innovation-webinars/>

NARUC thanks the U.S. Department of Energy for support for this series.

A circular inset image showing the U.S. Capitol building at night. The building is illuminated with warm lights, and its iconic dome is brightly lit. The scene is reflected in a body of water in the foreground. The sky is a deep purple and blue, suggesting twilight. Trees and other structures are visible in the background.

THANK YOU



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