Better Plants®
U.S. DEPARTMENT OF ENERGY

Virtual Training: Renewable Energy Contracting Options and RECs

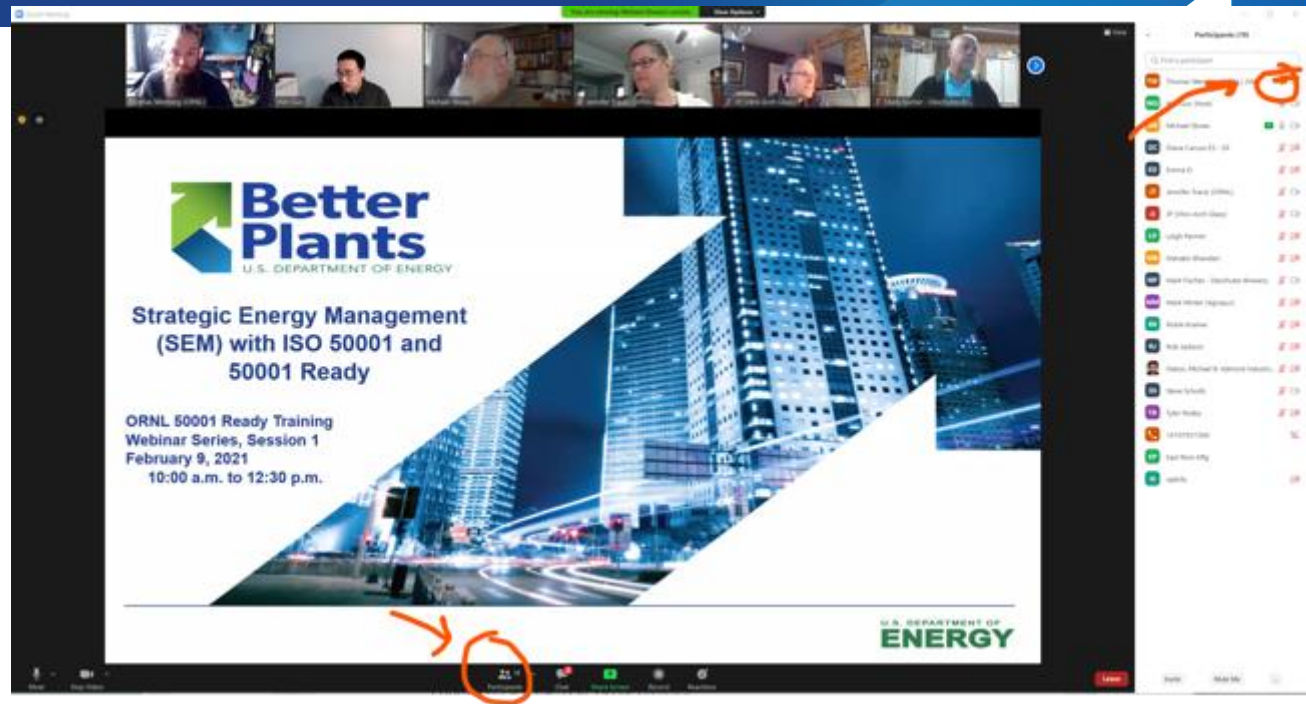
Purchasing Renewable Electricity: Best Practices and Success Stories

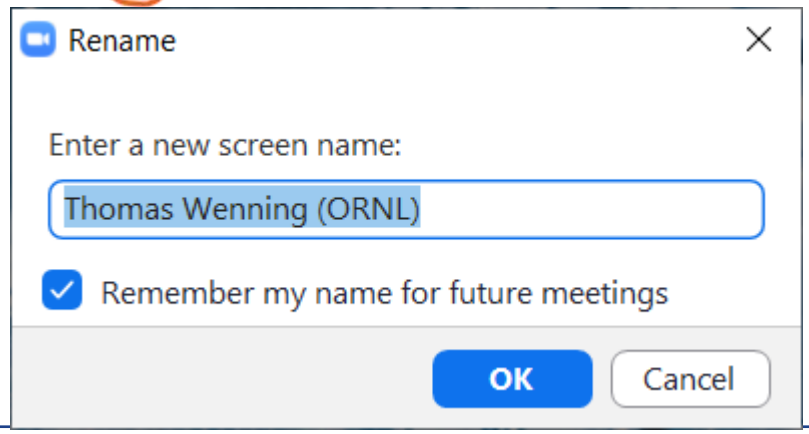
Session #5
September 2, 2025
10:00am – 12:00pm ET

U.S. DEPARTMENT OF ENERGY

Rename Yourself to be your Real Name (Company Name)

1. Click on Participant list
2. Go to the right and hover over your name
3. Select “More” & “Rename”
4. Enter your company name in brackets
5. Turn on your camera ☺





General Information

- Schedule: Every Tuesday (Aug 5th – Sep 9th) morning @ 10am ET
- Sessions will be recorded
- We want these VT to be interactive!
- We're hoping you finish the VT with some big progress
- There will be homework – just try your best!
  - "You'll get out what you put in!"

Links:
https://bptraining.ornl.gov/
http://betterbuildingssolutioncenter.energy.gov/better-plants
https://measur.ornl.gov

Training Overview

1. 08/05: Fundamentals Of Renewable Electricity And Emissions Inventory
2. 08/12: Understanding The U.S. Electricity Markets And Procurement Roadmap
3. 08/19: Purchasing Renewable Electricity: PPAs, VPPAs, and Other Supply Options
4. 08/26: Navigating Voluntary Electricity Markets
5. **09/02: Purchasing Renewable Electricity: Best Practices and Success Stories**
6. 09/09: Renewable Electricity Supply Options: Financing Models and Strategies

Poll Time!

Week 5 Poll: Question 1

- Which industry best represents your organization?
  - Food & Beverage
  - Chemicals & Petrochemicals
  - Pulp & Paper
  - Metals & Mining
  - Automotive & Transportation
  - Electronics & Semiconductors
  - Energy & Utilities
  - Other Manufacturing
  - Others? Put it in the chat!

Week 5 Poll: Question 2

- What best describes your role?
  - Plant/Operations Manager
  - Technical Staff
  - Energy or Sustainability Manager
  - Corporate/Executive Leadership
  - Other (please share in chat)

Week 5 Poll: Question 3

- How many manufacturing facilities does your organization operate?
  - 1–2
  - 3–5
  - 6–10
  - More than 10

Week 5 Poll: Question 4

- What is your primary interest in today's session?
  - Learning about best practices
  - Exploring new technologies
  - Networking/collaboration
  - Identifying cost savings
  - Other? (please use the chat)

Today's Speakers

Chris Pennington

Director of Energy & Sustainability,
Iron Mountain Data Centers

DOE Better Buildings, Better Plants

Webinar Sept 2nd, 2025

IRON MOUNTAIN®
DATA CENTERS

What is a data center?

Highly secure facilities with:
- Rich connectivity to the internet
- Robust power systems
- Climate controlled for cooling

Every aspect of our digital experience is enabled by data centers

We are the ‘utility’ to our customers

IRON MOUNTAIN®
DATA CENTERS

Our goals

Efficiency - Power and water efficiency aligned to the standards set by the Climate Neutral Data Center Pact

Circularity - Supporting our customers with solutions to repurpose, remarket and recycle their IT assets

Green Buildings - Construct all new multi-tenant facilities to achieve BREEAM certification, or local equivalent

Clean Power - Continue matching 100% of purchased electricity with clean power, achieve 24/7 CFE by 2040

Net Zero Emissions - Scope 1 and 2 by 2030 and within our direct value chain ✓Scope 3) by 2040

Heat Reuse - Explore all options to connect to local district heating networks

Our clean energy journey

2013

First report

2015

First vPPA

2016

Last vPPA

RE 100

SCIENCE BASED TARGETS

2018

RE100

SBTi

"100% renewable"

24/7 CARBON FREE ENERGY

2021

24/7 CFE goal

Hourly matched retail procurement

Today

BESS pilot project

Tidal energy PPA

Distributed solar PPA

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Lessons learned (sometimes the hard way)

Data is critical
- Enables better discussions and decision making
- Began by capturing utility bills globally then connected that data to real estate data

Meet people where they are at
- Gaining permission to proceed based on wide stakeholder buy in

Beware of simple solutions
- They never really are, or if they are then they're seldom worth it

Beware of complex solutions
- Don't be the only one that knows how or why something happens

If you don't tell the story, did it ever really happen?
- Demonstrating performance and progress is more important than ever (goes back to data)

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Current focus

Increasing 24/7 CFE performance
- Matching consumption hourly with local clean power

Moving from ***buying*** clean power to ***using*** it
- Using load to enable more clean power onto grids

Preparing for new GHG accounting rules
- How does this impact our goals and what we say?

Preparing for increased policy engagement
- Policy is driving power availability, costs and reporting

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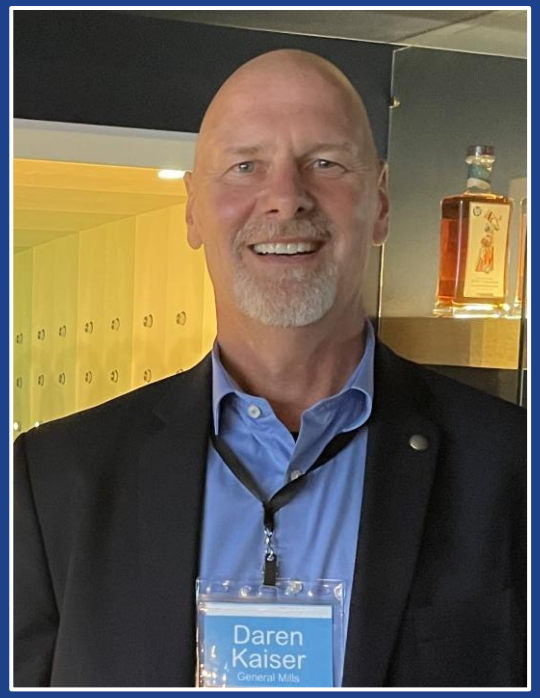
Questions?

5 Minute Break

Today's Speakers



Daren Kaiser

Global Energy Strategy Leader,
General Mills

Renewable Electricity

Source 100% renewable electricity for General Mills' global owned operations by 2030.

In fiscal 2024, we achieved a 100% match of electricity consumed with renewable electricity.

A key part of achieving our climate goal is through investing in renewable electricity. This type of energy emits little to no greenhouse gas or pollutants into the air.

How Much Electricity Does General Mills Use?

Globally, we consume about 1.3Million MWH of power each year across our owned operations, offices, warehouses, etc. The vast majority of that consumption (almost 1Million MWH) is in North America. This matches the amount that our 80,000-acre **Maverick Creek & Cactus Flats wind farms** add to the grid in central Texas.

We're excited about the **new Carbeso solar project** near Barcelona city in Spain set to begin generation in June 2026. Our 15-year offtake agreement with Carbeso will supply about 82,000 MWH/yr to the grid which matches our annual EU consumption.

Additionally, we purchase a small amount of incremental green energy generation certificates in other regions to ensure that our **overall green power additions** to grids **match our total consumption**.

EPA United States Environmental Protection Agency

Partner Name	Annual Green Power Usage (kWh)	GP % of Total Electricity Use*
10. PepsiCo	1,873,340,758	98%
23. General Mills	1,037,554,000	106%
27. Mars, Incorporated	868,646,310	78%
29. Hormel Foods Corporation	819,184,000	89%
38. Bimbo Bakeries USA, Inc.	520,233,000	101%
49. The J.M. Smucker Co.	383,579,361	99%

GMI ranks #23 overall on the EPA's Green Power "Top-100" list and is the second highest ranking CPG company

Coming Soon:

Carbeso Solar

Rather than continuing to purchase green energy certificates in EU; we've recently contracted with the new Carbeso solar project to add green power to the grid directly on our behalf (start in F27)

DOE Better Plants – Renewable Energy VPPA's & RECS

Making Food the World Loves

Since 2010 we've reduced Scope 2 by 99% from 700,000→20,000 MTCO2e

- Cash Positive VPPA's
- Efficiency optimization
- **$50 Million Cash Banked**

Today's Topics:

- Our GMI RE journey [Ambition→Glidepath→Method→Results & Learnings]
- Challenges; Successes & Tips
- Outlook & Trends

General Mills Public Climate Goals

OUR GOAL:
REDUCE GREENHOUSE GAS EMISSIONS

30%

ACROSS OUR ENTIRE VALUE CHAIN

farm TO fork TO landfill

OVER THE NEXT **10 YEARS**

& NET ZERO BY **2050**

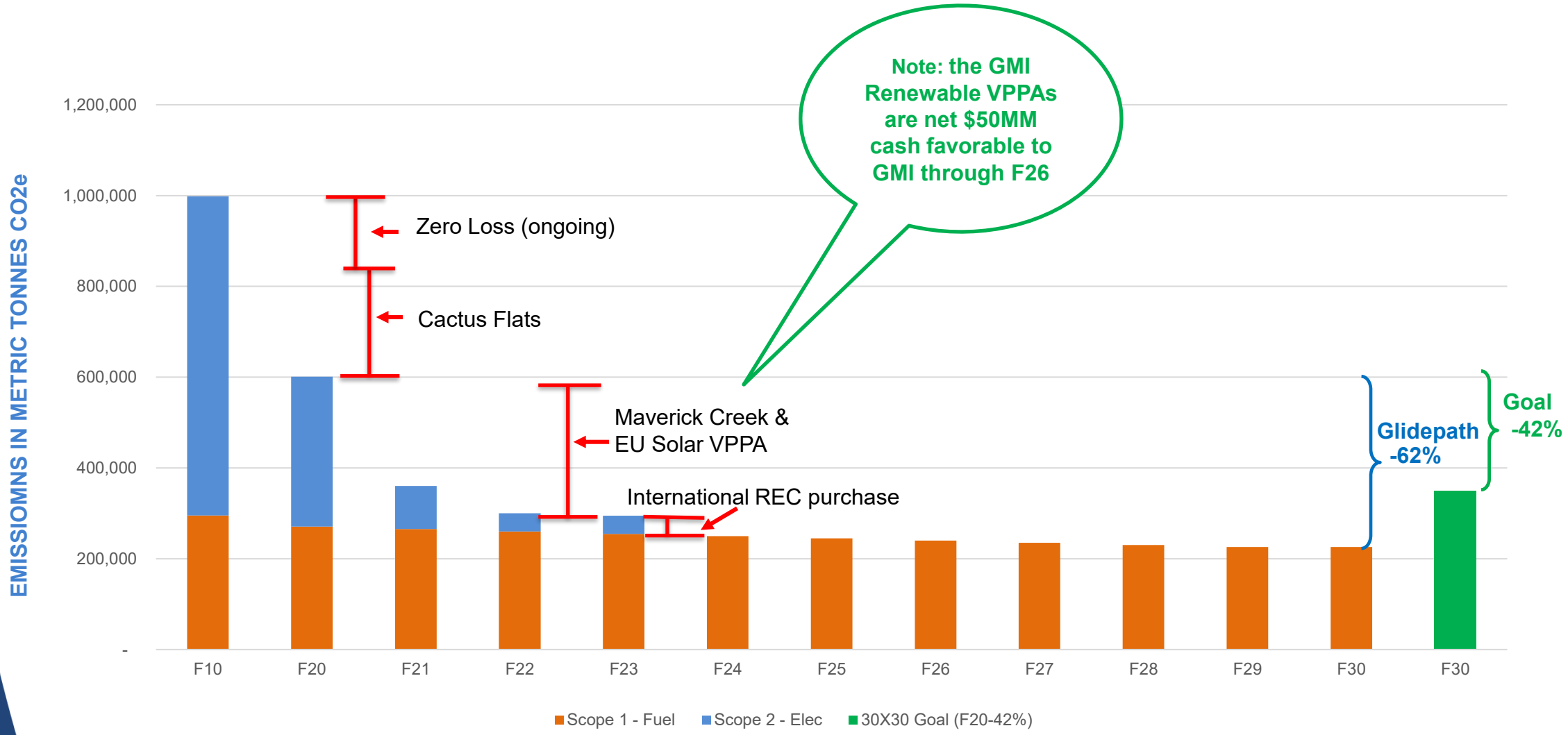
Since 2020 we've reduced our emissions in our owned operations by 49%

2020 GMI Greenhouse Gas Footprint: 96% Scope 3 Emissions

Updated GHG Footprint "Profile"

40%	8%	5%	24%	<1%	22%
Agriculture & Transformation	Packaging Supply Chain	Manufacturing & Producing	Shipping	Selling	Consuming

Global Producing GHG 30x30 Glidepath



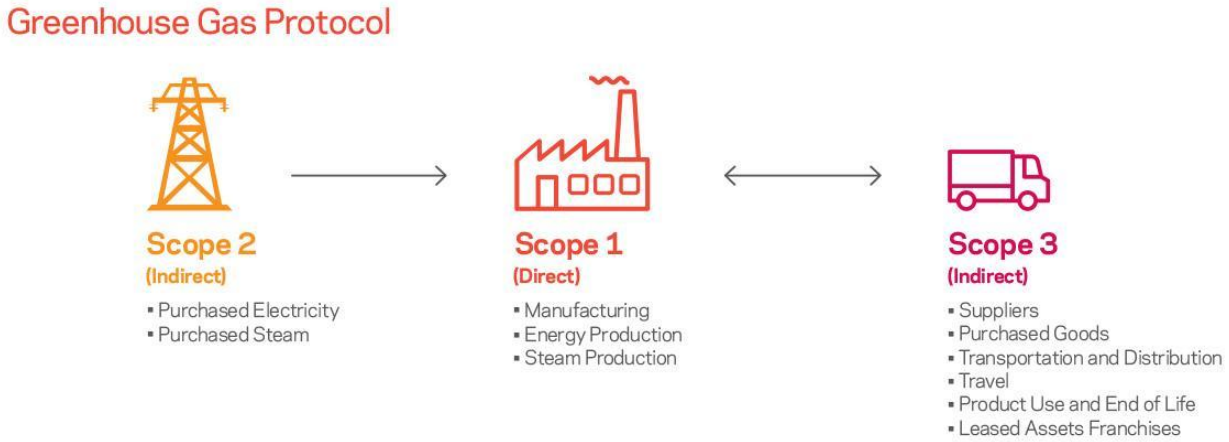
GMI US Wind Farm Project History

Cactus Flats:

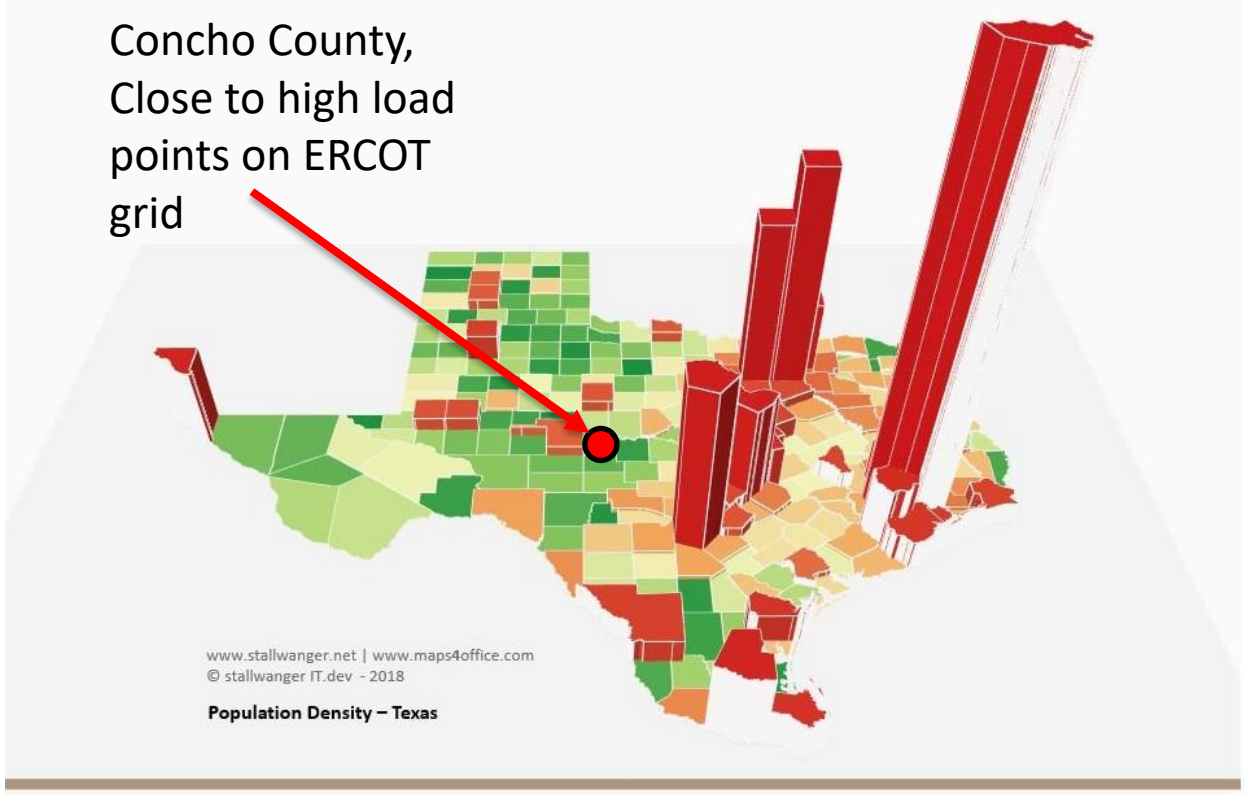
- ✓ Goal to equal 30% of US electricity with wind RECs to support our GHG Reduction Ambition
- ✓ 100MW VPPA agreement approved May 2017
- ✓ Commercial generation commenced August 2018

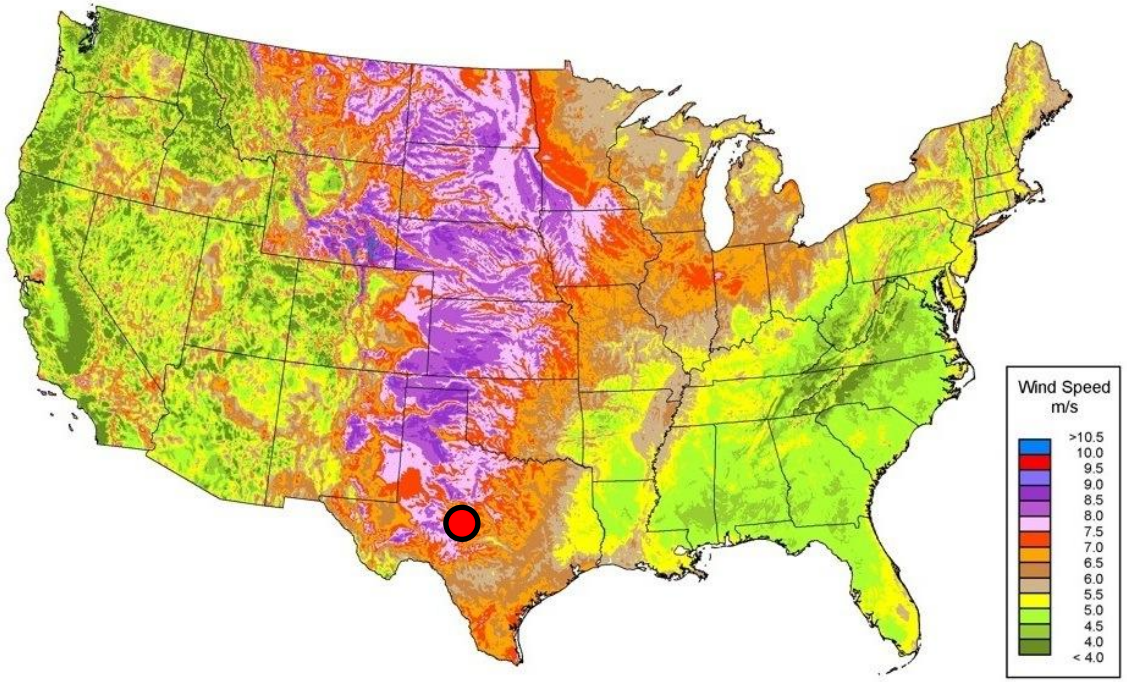
Maverick Creek:

- ✓ Maverick + Cactus Flats = 100% of US+CD power purchases
- ✓ 200MW VPPA agreement approved Feb 2019
- ✓ Commercial generation began Nov 2020



Both projects near Eden, TX





ERCOT Central TX is advantageous location

- strong future demand & low congestion
- most favorable financials
- community support

GENERAL MILLS

EPA GPP Project Map - USA

Green Power Partnership Project Map

Download | Tour This Dashboard | Information

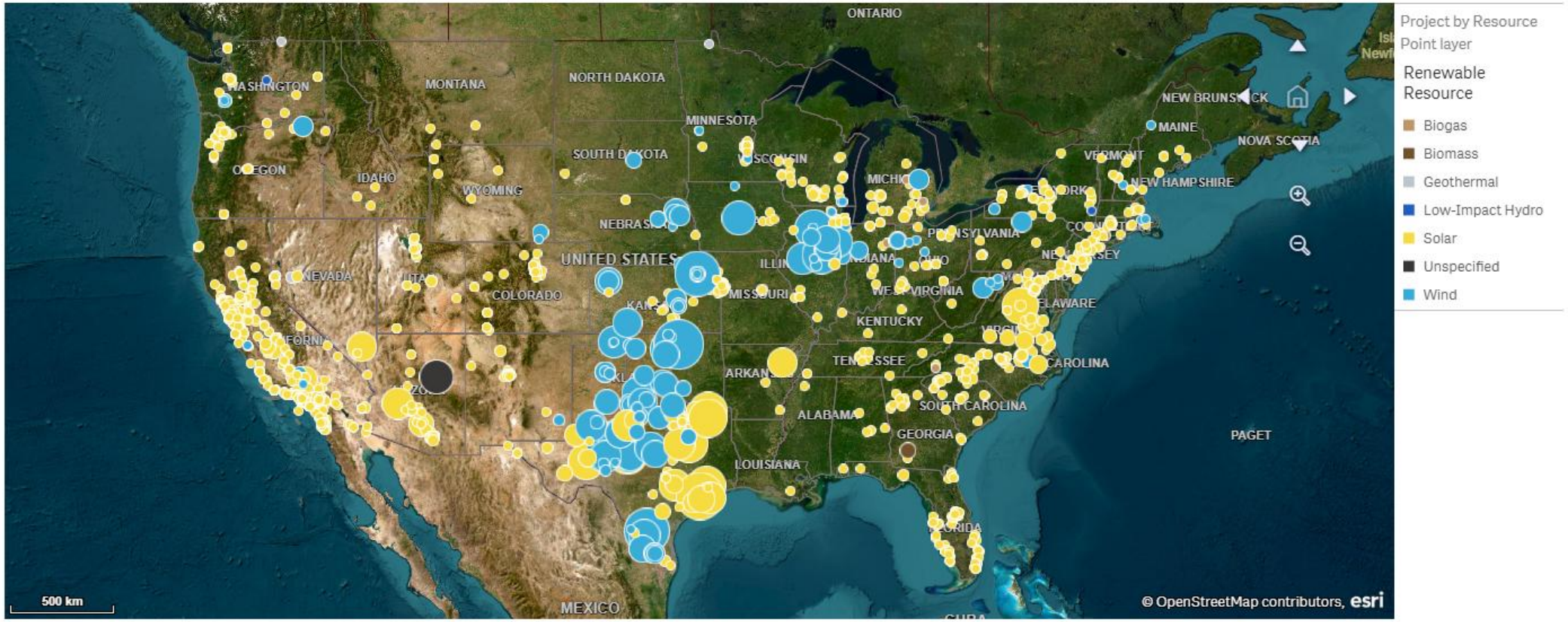
Filters:

- Renewable Res...
- Supply Option
- Project Size
- Industry
- Partner

Buttons:

Confirm | Go Back | Show All

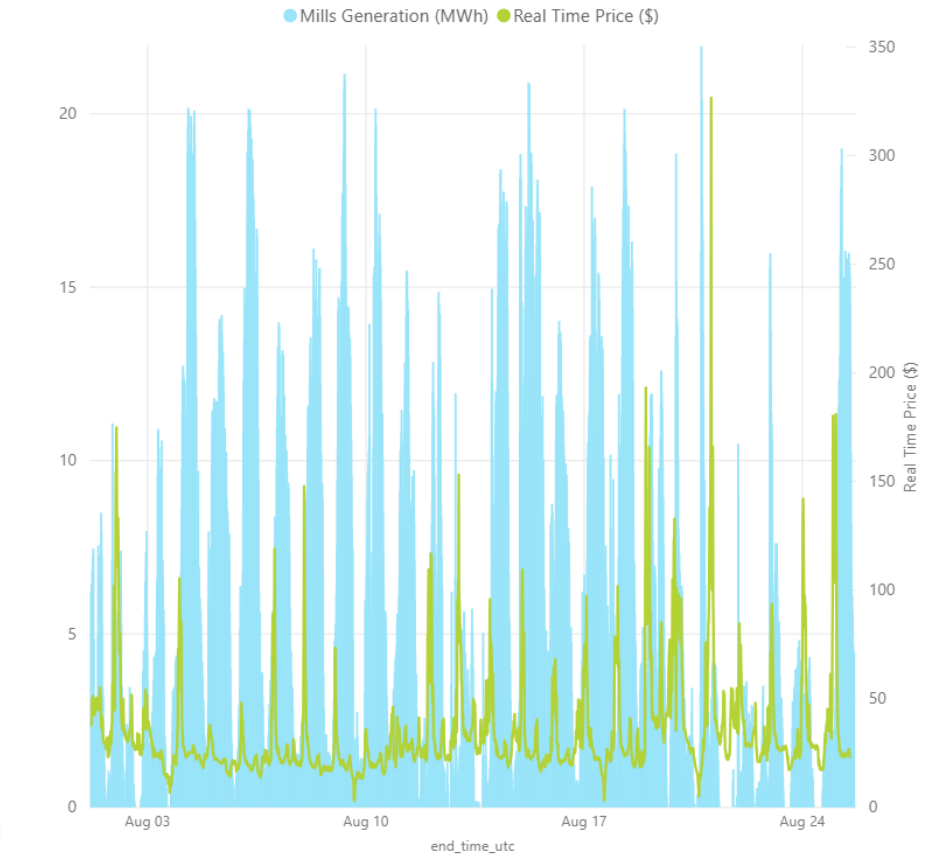
Mapped Projects	Total Projects	Green Power Use (kWh)	Rated Capacity (kW) of Projects
2,095	2,441	54,216,049,971	19,359,080

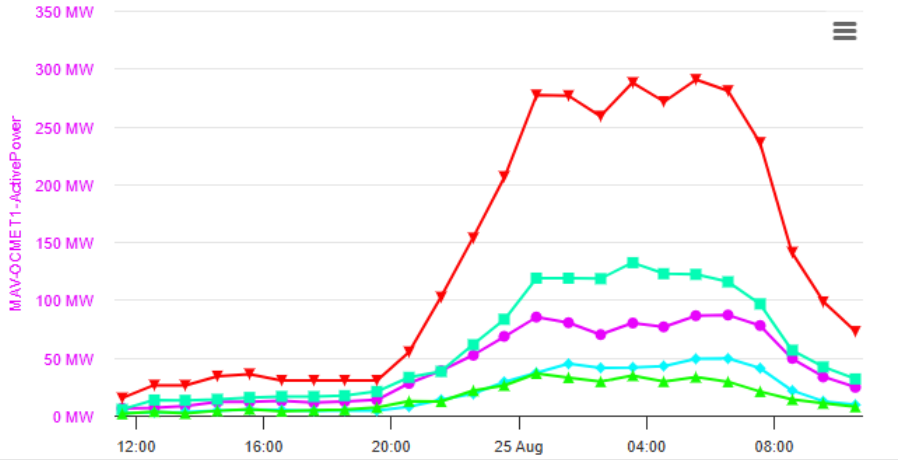


Hover over a project for details. Click and confirm to zoom into the project. Or zoom in manually using the navigation tools on the map.

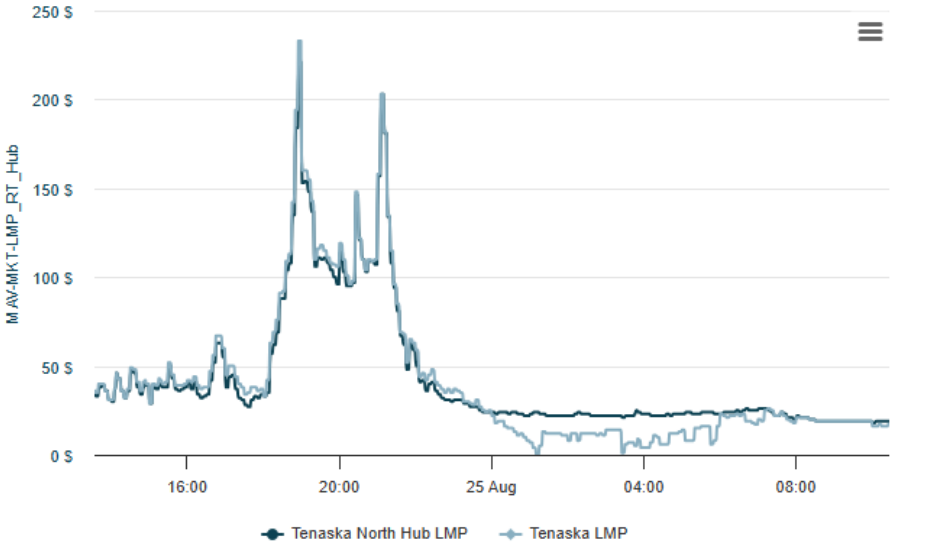
VPPA Strike Price vs Grid Price (when Generating!)

- Real Time Grid Pricing dynamics vary by Region & Hub
  - ie. ERCOT RT Price generally inverts with wind speed
- Weather Extremes are dominant driver to RT Price spikes
- The window for lucrative grid-scale projects has closed





North Hub LMP



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VPPAs net > 140% of our fossil power use

General Mills matches 100%+ of fossil-power used with zero-carbon power.

US EPA Green Power "Top 100 List"

Green Power Partnership National Top 100

As of October 23, 2023, the combined annual green power use of EPA's Top 100 Partners amounts to more than 93 billion kilowatt-hours, which is equivalent to the annual electricity use of more than 8.7 million average American homes.

Usage figures are based on annualized Partner contract amounts (kilowatt-hours), not calendar year totals. These rankings are updated on a quarterly schedule. Find out how your organization can partner with EPA today!

GMI Green Power leadership amongst large food peers

[Green Power Partnership National Top 100 | US EPA]

Partner Name	Annual Green Power Usage (kWh)	GP % of Total Electricity Use*	Industry	Green Power Resources
9. PepsiCo	1,873,340,758	98%	Food & Beverage	Solar, Wind
24. General Mills	1,037,554,000	106%	Food & Beverage	Wind
26. Hormel Foods Corporation	937,884,298	100%	Food & Beverage	Solar, Wind
28. Mars, Incorporated	816,044,322	73%	Food & Beverage	Solar, Wind
37. Bimbo Bakeries USA, Inc.	512,475,391	101%	Food & Beverage	Wind
41. The J.M. Smucker Co.	436,692,276	94%	Food & Beverage	Wind
42. Unilever	435,065,880	100%	Consumer Products	Various

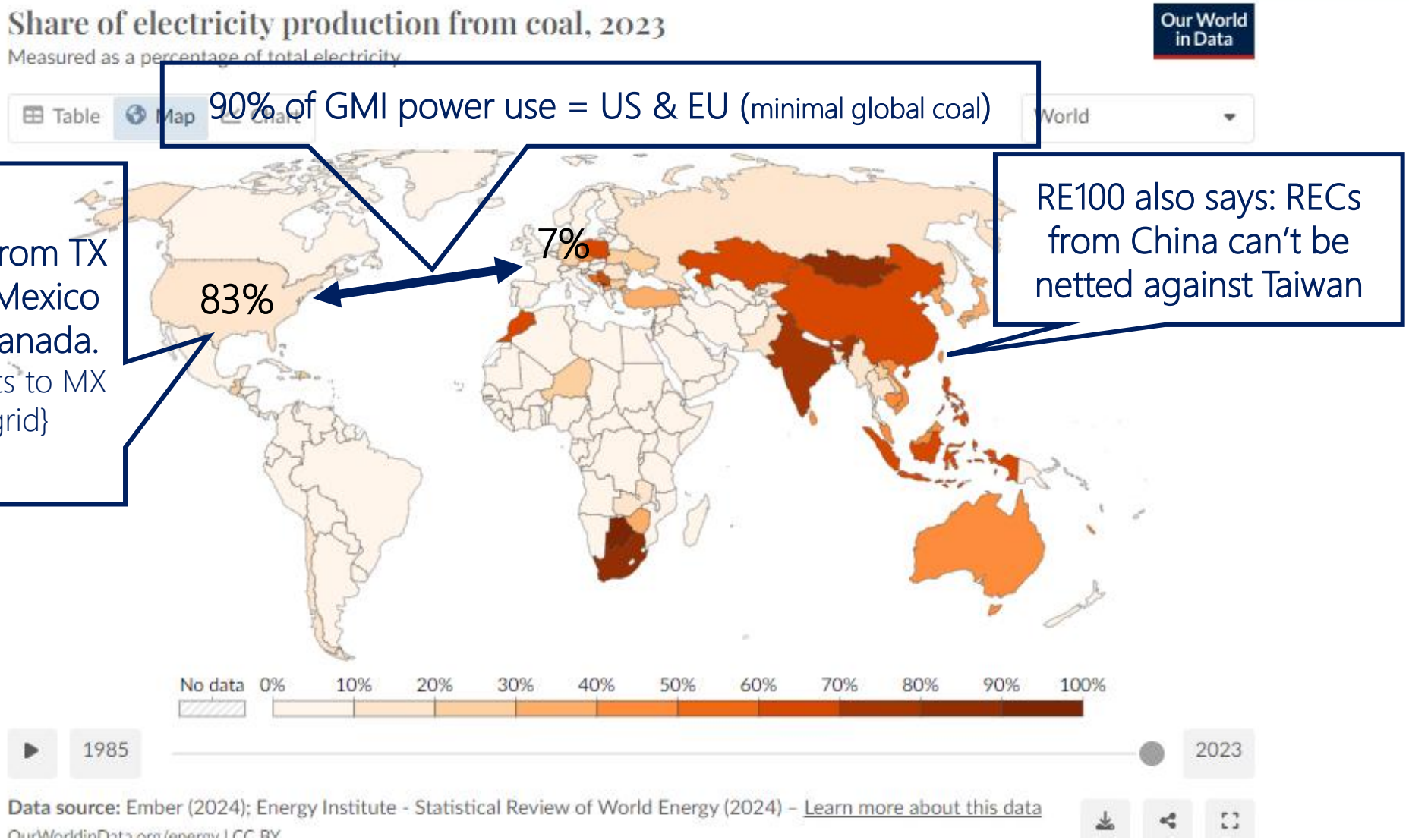
Opportunity for GMI to control messaging
& leverage VPPA agreements for incremental business value

General Mills Pivot RE100 -> Zero-Carbon Power [potential for F25]										
Market	Total Consumption of electricity (MWH)	Fossil-based power Consumed (MWH)	Self-generated renewable electricity in scope of RE100 (MWH)	Green Power Attributes Purchased {RECs/GOs} (MWH)	Total Green Power (MWH)	annual ($cost) of REC Acquisition (US$)	% of REC/RE power vs Total Power	RE100 option % of REC/RE power vs Fossil Power Consumed	allowable RE100 claim	Zero-Carbon option % of REC/RE power vs Fossil Power Used (VPPAs)
US & Canada	1,020,000	612,000	-	1,020,000	1,020,000	VPPA	100.0%	166.7%	100.0%	166.7%
European single market	85,000	34,000	3,125	81,875	85,000	VPPA	100.0%	250.0%	100.0%	240.8%
China & Hong Kong	65,000	55,250	670	64,330	65,000	(45,000)	100.0%	117.6%	100.0%	
Brazil	27,000	13,500	-	27,000	27,000	(20,000)	100.0%	200.0%	100.0%	
Mexico	15,000	13,500	-	15,000	15,000	(25,000)	100.0%	111.1%	100.0%	
Australia	10,000	9,000	-	10,000	10,000	PPA	100.0%	111.1%	100.0%	111.1%
India	8,000	6,000	-	8,000	8,000	(15,000)	100.0%	133.3%	100.0%	
Taiwan, China	3,000	2,850	-	3,000	3,000	(400,000)	100.0%	105.3%	100.0%	
Republic of Korea	800	640	-	800	800	(1,000)	100.0%	125.0%	100.0%	
Singapore	165	165	-	165	165	(15,000)	100.0%	100.0%	100.0%	
United Arab Emirates	125	125	-	125	125	(1,000)	100.0%	100.0%	100.0%	
Totals:	**1,234,090**	**747,030**	**3,795**	**1,230,295**	**1,234,090**	**$ (522,000)**	**100%**	**165%**	**100%**	**149%**

FROM: *Source 100% renewable electricity for our operations by 2030* {*per RE100 criteria}*

TO: *General Mills matches 100% of its global fossil-power use with zero-carbon power*

RE100 criteria seems flawed considering "*it's one Earth*"



90% of GMI power use = US & EU (minimal global coal)

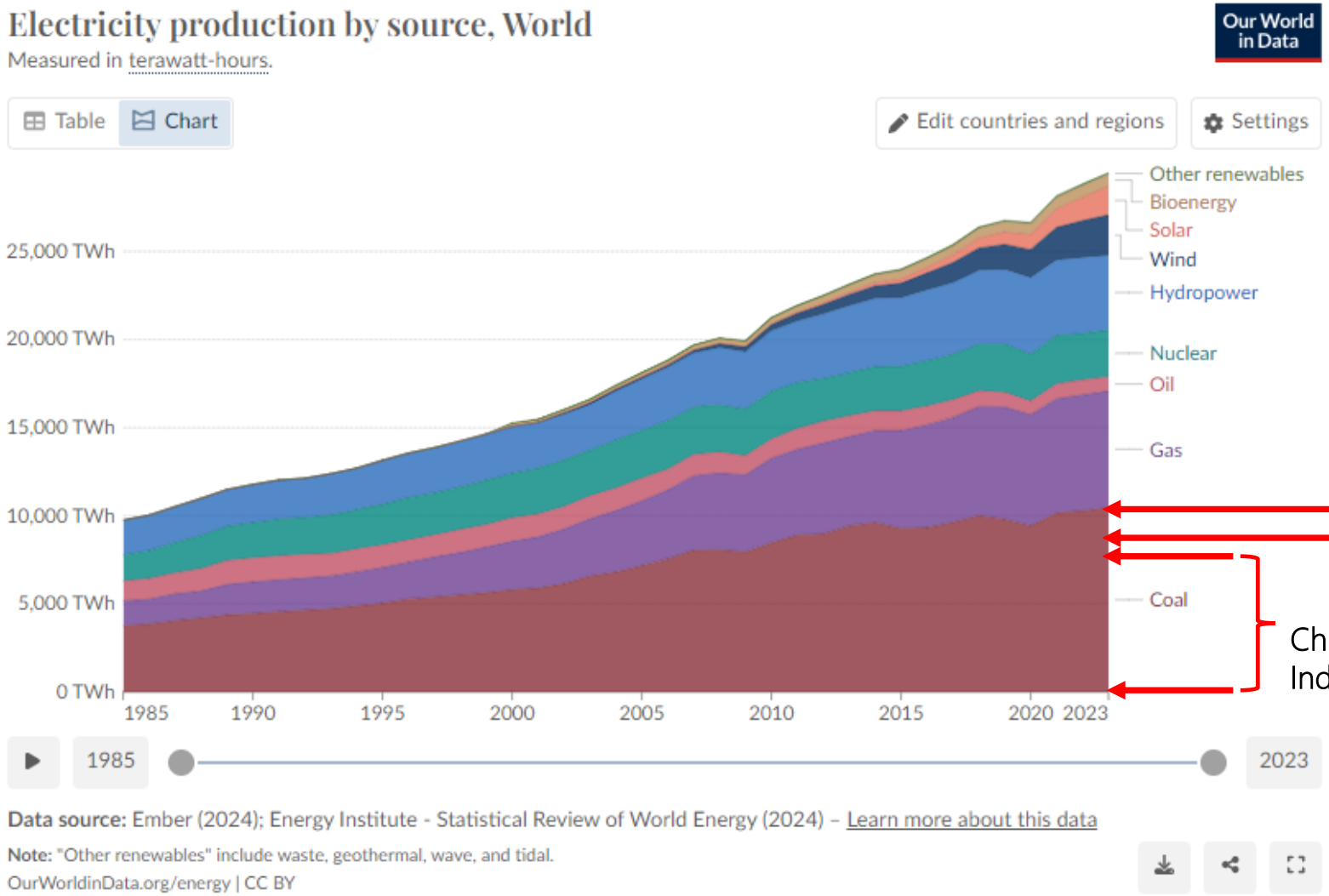
7%

83%

RE100 says: RECs from TX can't net against Mexico but can against Canada. {ERCOT grid connects to MX but not the US grid}

RE100 also says: RECs from China can't be netted against Taiwan

Barrier to "clean Grid" is China/India



China Abandons Paris Agreement, Making U.S. Efforts Painful and Pointless | The Heritage Foundation

All others = 2,200 TW

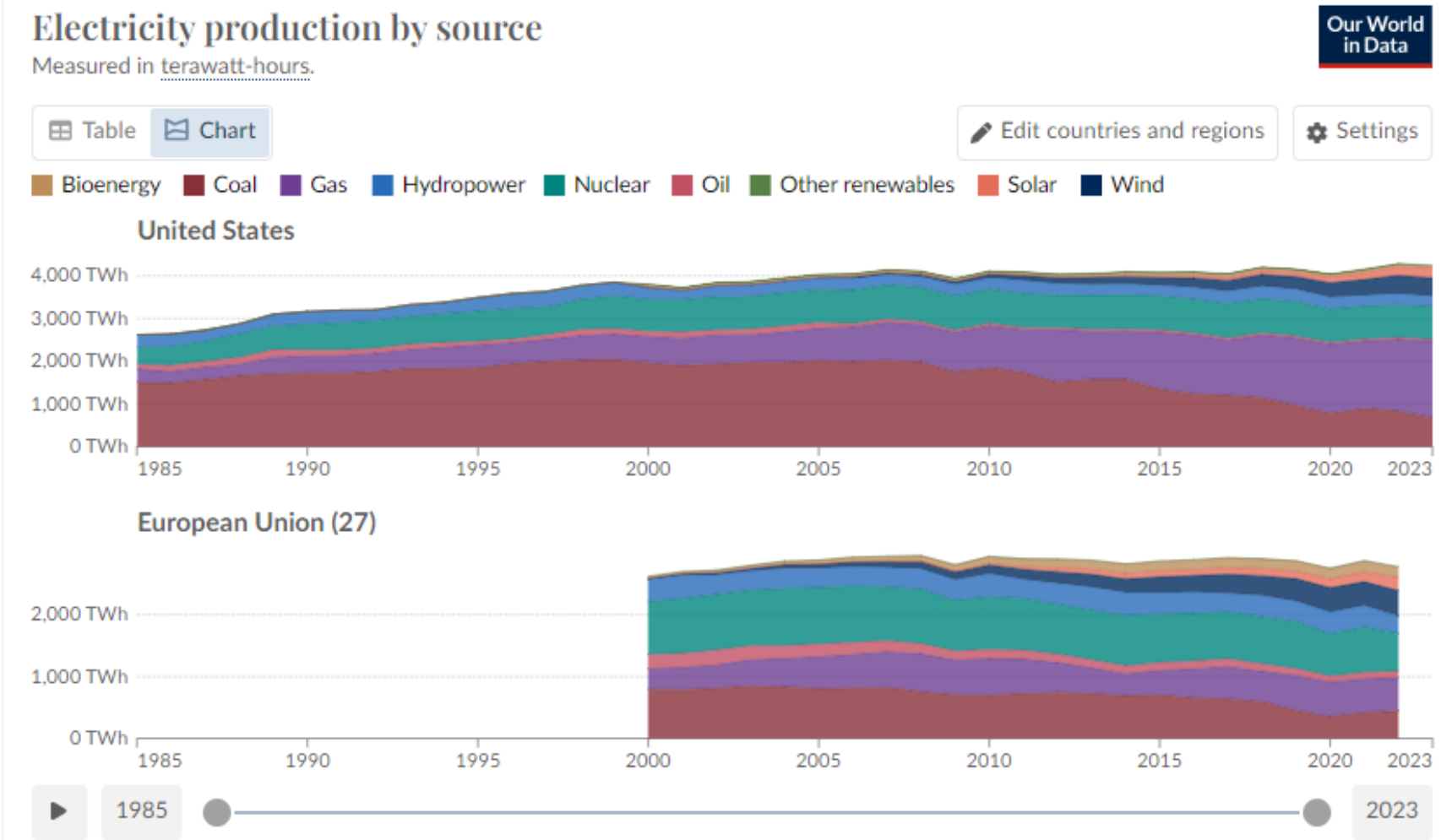
US = 670 TW

EU (27 countries) = 450 TW

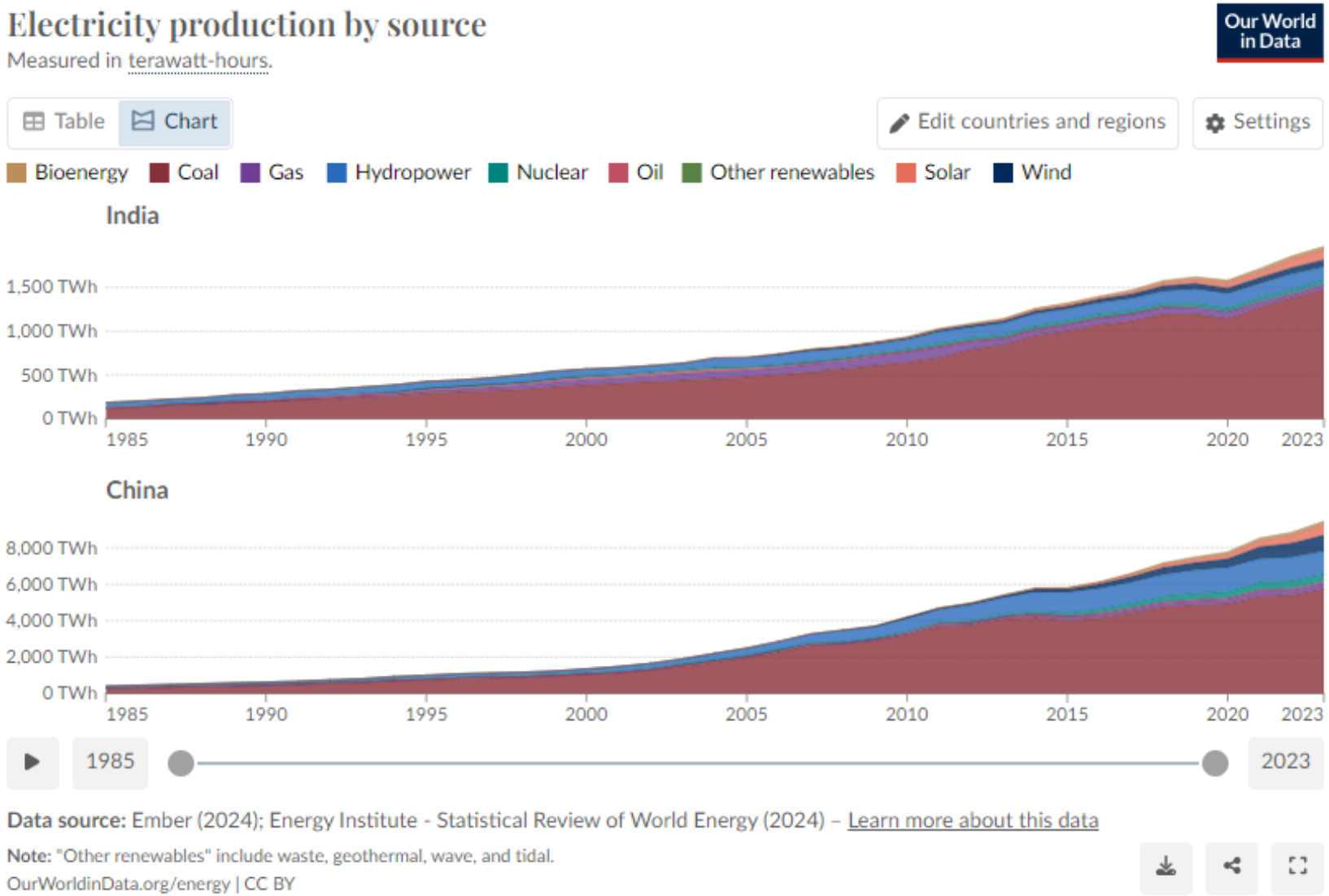
China = 5,700 TW

India = 1,400 TW

Greening of Power Grid….US & EU



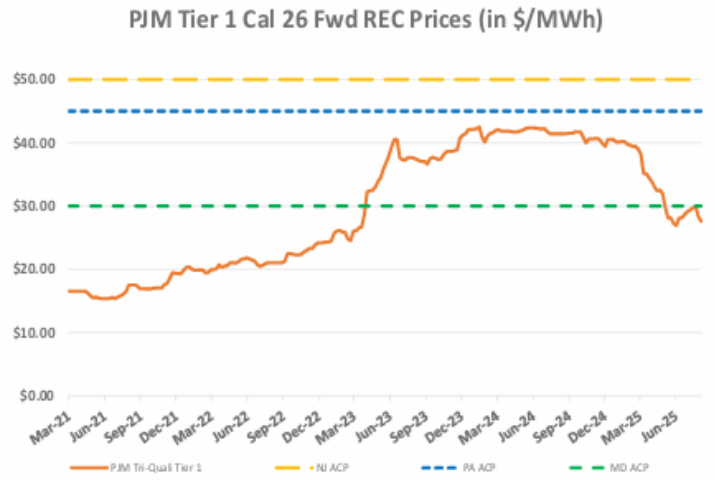
Only Coal increases are China & India….

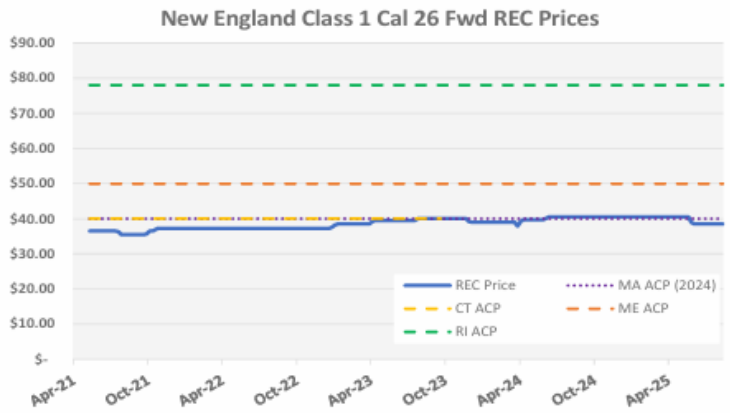


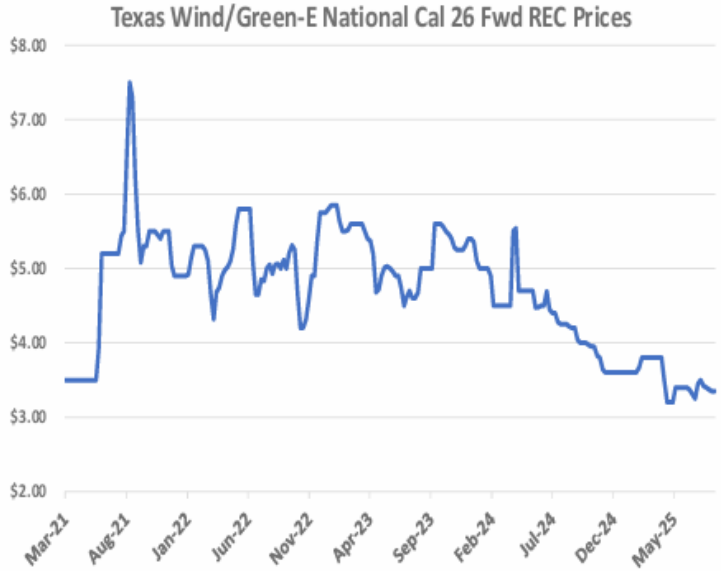
REC Pricing Trends - US

- REC prices declining
- Corporate requirement for RECs & GHG is unknown
- Purchasing required RECs only seems like the low-cost option
- New VPPA deals out of the money
- Rooftop solar PPAs still financially attractive in certain regions

REC Markets Remain Under Pressure



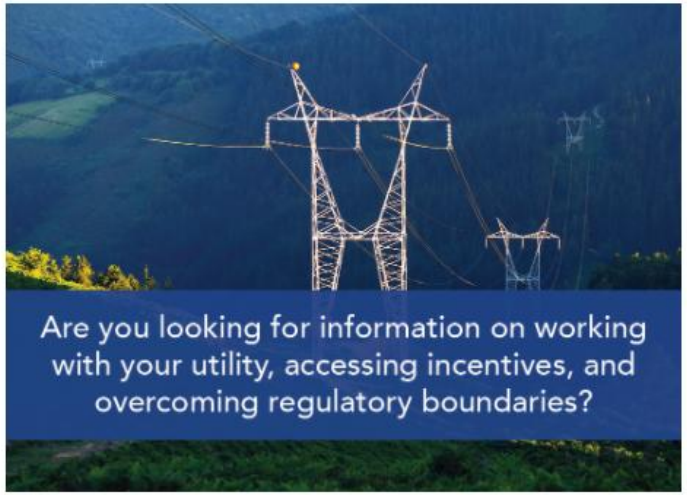




Thank you!

Questions?

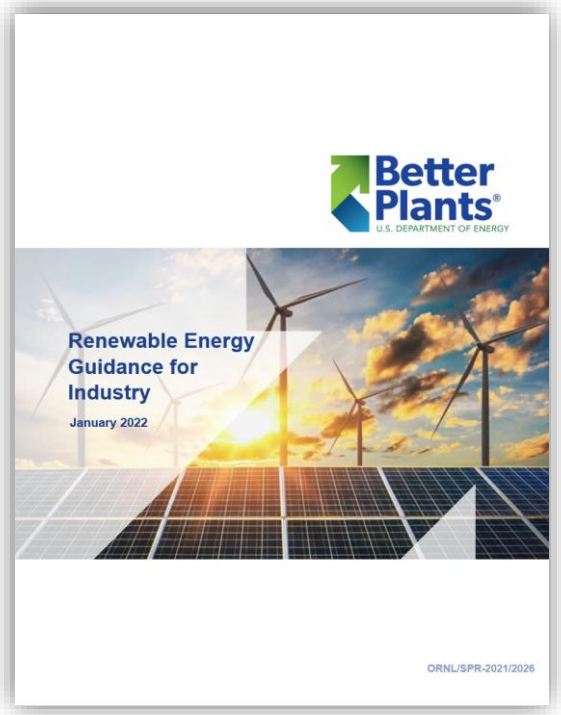
Better Buildings Renewable Energy Resource Hub



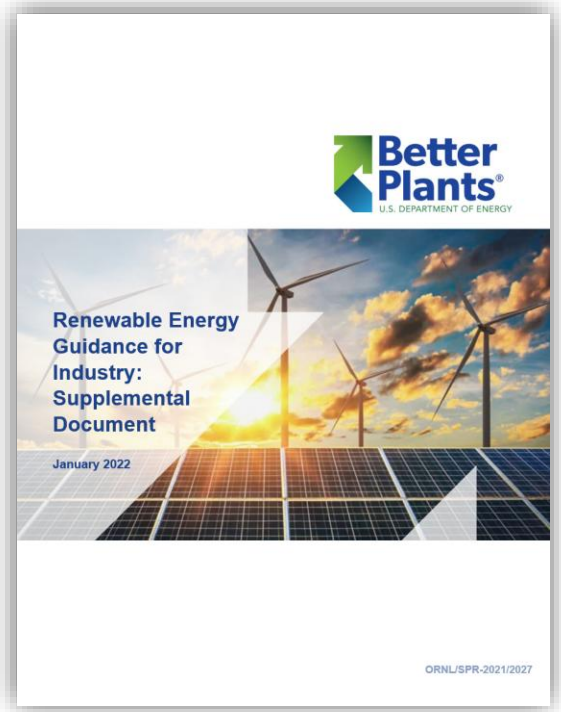
Renewable Energy for Industry Guidance Documents

- Access the full main document here.

- Access the supplemental document here.



Main Document



Supplemental Document

Other Resources:

- Onsite Energy Program
- Better Plants Solutions Center
- Federal Battery Storage Tax Credit
- State-Level Incentives
- General Energy Storage Facts
- U.S. Solar Photovoltaic System and Energy Storage Cost Benchmarks
- Energy Storage Cost and Performance Database
- DOE Factsheets on Energy Storage
- Grid-scale Energy Storage Technologies Primer – NREL
- 2024 Electricity ATB Technologies and Data Overview