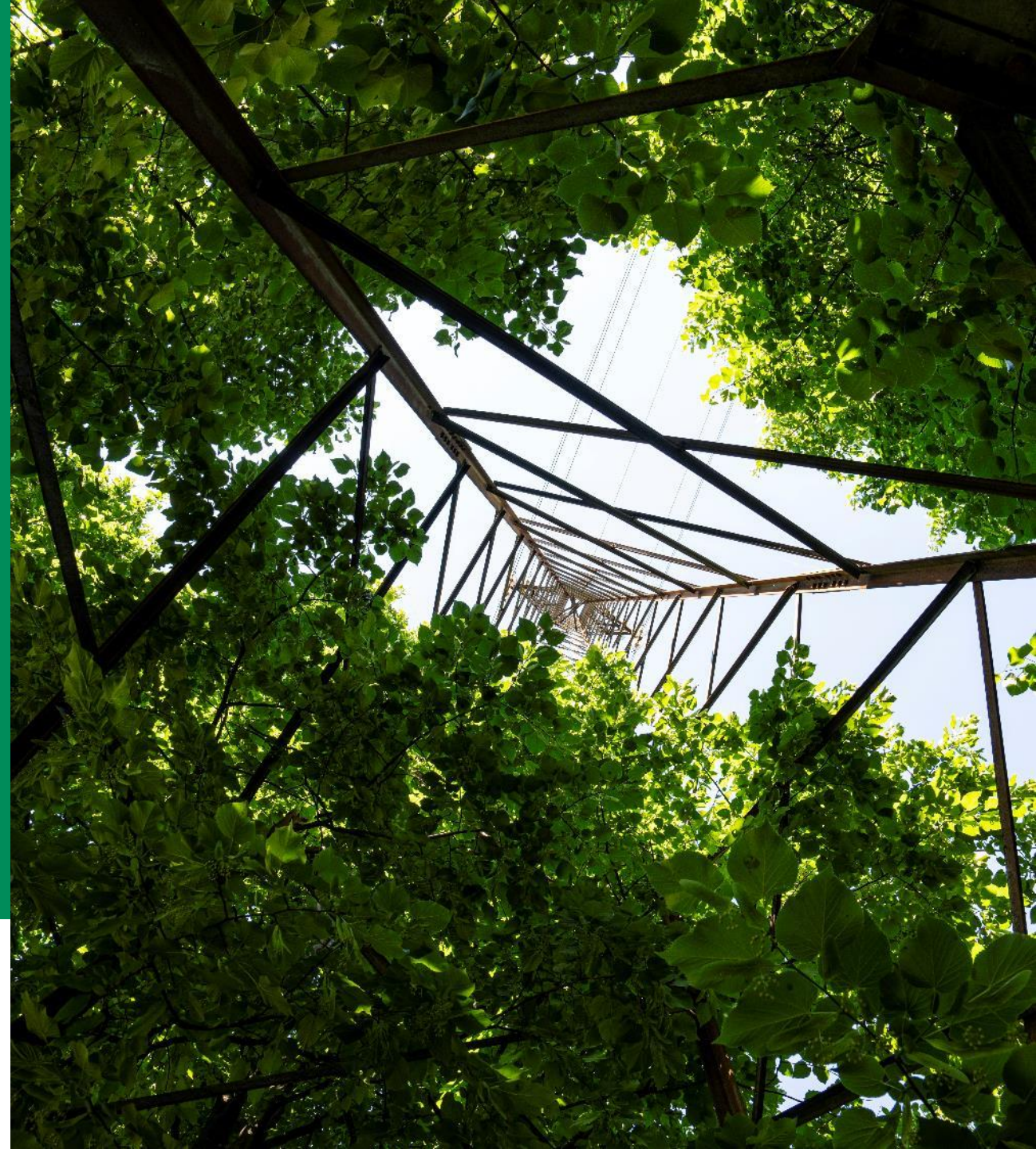


Demand response: an easy win for your decarbonization strategy

Demand response (DR) has become a critical tool for the clean energy transition. Learn how this solution can serve as a cornerstone of your decarbonization strategy to deliver economic and environmental benefits while promoting grid sustainability.

October 9, 2024
Environment + Energy Leader



Introduction



Marcus and Jennifer – add one fun fact –
or clean up bios if you want



Jennifer L. Taylor, Esq.

Head of Compliance,
Demand Response
Enel North America

- Ensures internal policies are in place to support adherence to market rules
- Developed policies to accelerate adoption of EV charging, utility-scale development, creation of a western RTO, and supporting DERs
- For the past decade, she has championed sustainability, carbon reduction, and economic opportunities associated with clean energy



Marcus Krembs

Head of External Relations
and Sustainability
Enel North America

- Established and led sustainability departments throughout Enel
- Led the integration of Enel's Creating Shared Value (CSV) sustainability performance model
- Over 20 years of experience working across the energy value chain and sustainability



Agenda

- 1. The growing need for decarbonization and sustainable energy strategies**
- 2. Demand response (DR) 101**
- 3. Corporate sustainability strategy 101**
- 4. Why demand response should be part of your decarbonization strategy**
- 5. Q&A**

We are Enel, a global leader in the energy transition

Marcus provide ESG stat



Enel has pledged **zero carbon** by 2040

\$190 B
Invested in clean energy by 2030



Enel is the world's largest private player in **renewables**

By installed capacity. Includes renewable managed capacity.

11.4 GW
Renewable capacity in North America
61 GW globally



Enel is a world leader in **demand response (DR)**

4.9 GW
DR capacity in North America
9.6 GW globally



Enel manages a large portfolio of **DR resources**

9,000+
Customer sites enrolled in North American DR markets with Enel





Data as of April 2024

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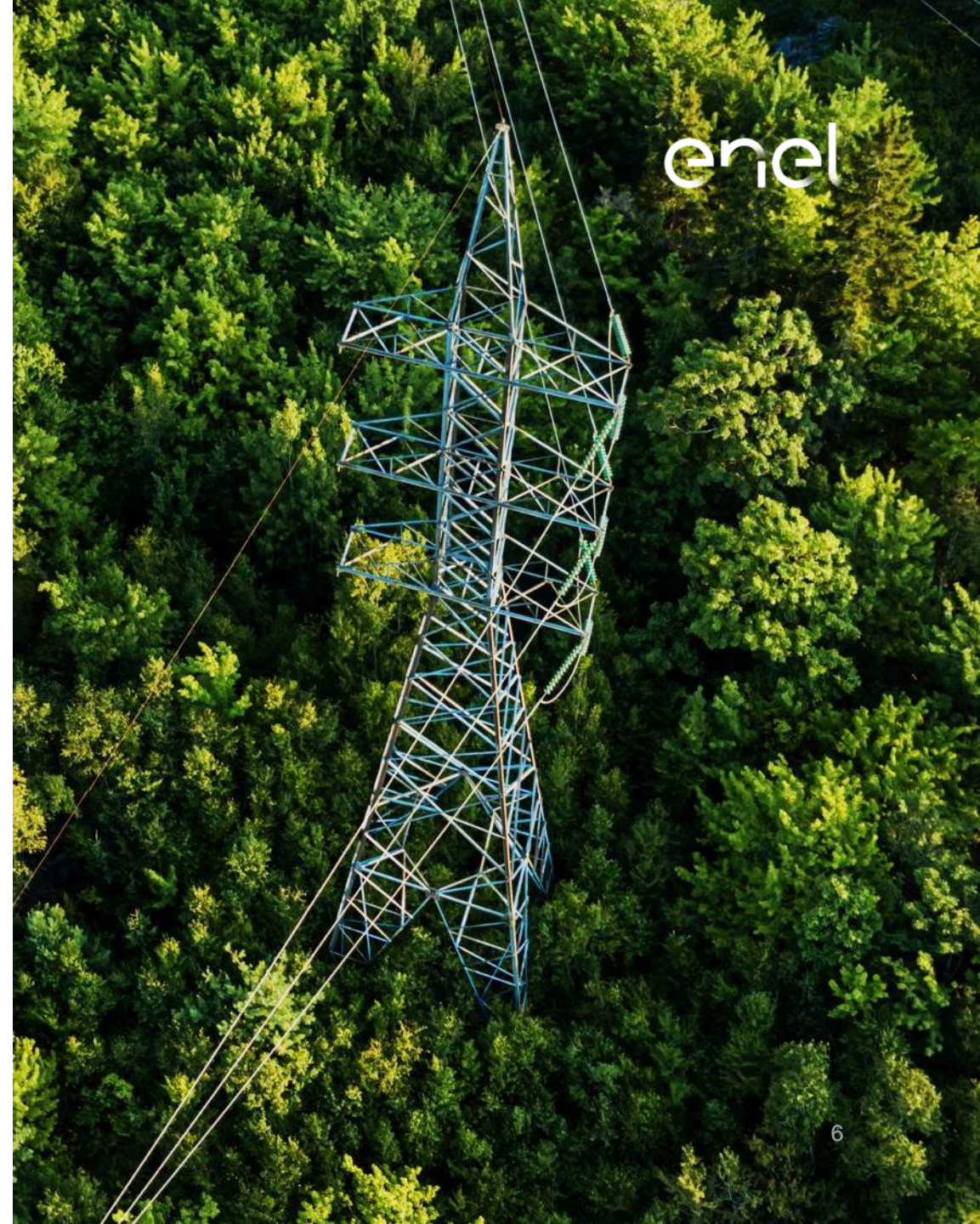
The growing need for decarbonization and more sustainable energy strategies

Sustainability and flexibility have become imperative for the grid and to large energy consumers

 **For large energy consumers:** Factors such as climate change, energy market volatility, stakeholder demands, and regulatory changes are driving the need for energy strategies focused on decarbonization.

 **For the electric grid:** Grid operators are focusing on more cost-effective and less fuel-intensive ways of balancing supply and demand. Historically, they have relied on peaker plants, which are expensive to maintain and typically powered with fossil fuels.

Let's dive into some of these factors



enel

Demand for electricity for growing

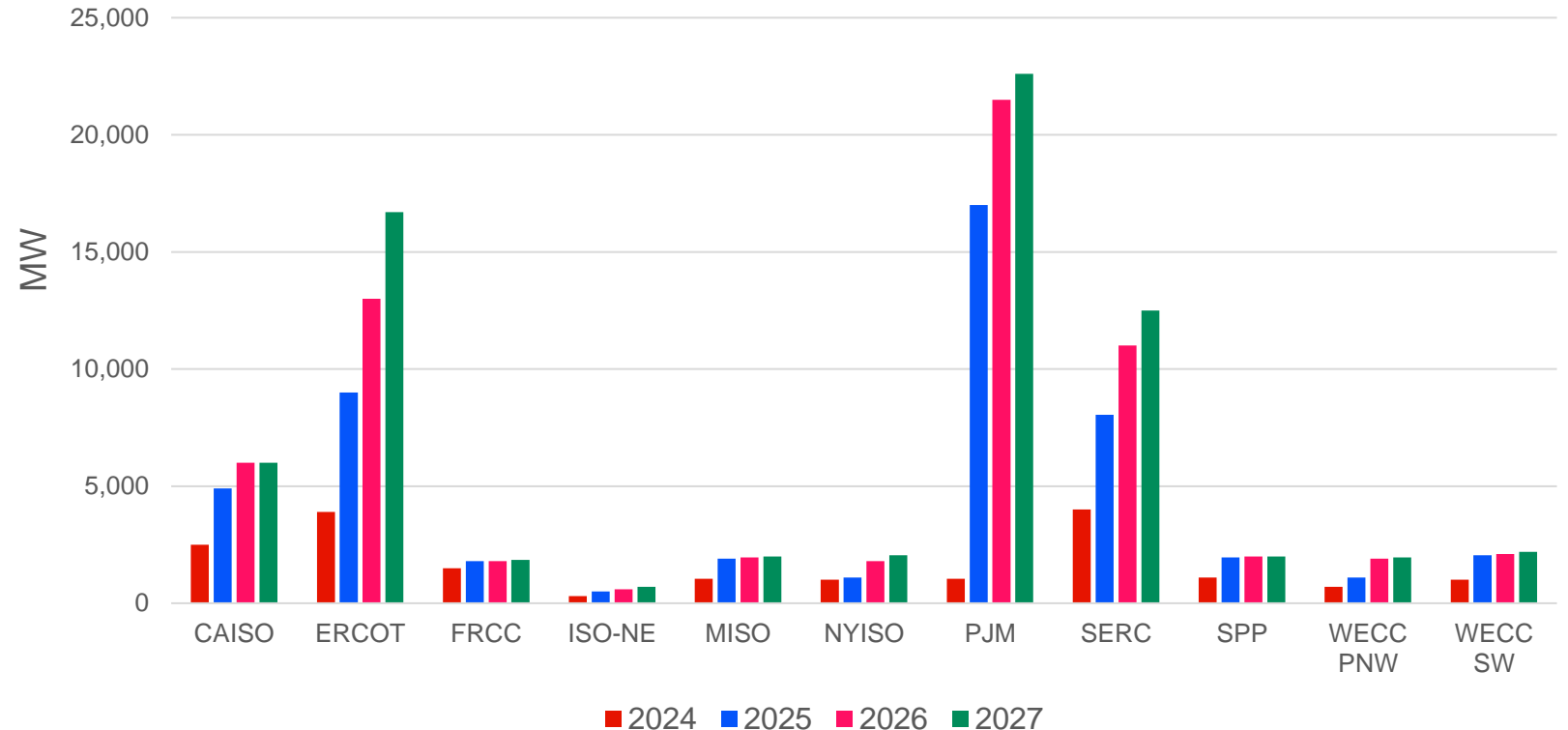
Large energy users like data centers and manufacturing are spurring demand for energy



Bringing new generation online is a challenge, and the rollout of new renewable projects is not keeping pace with projected load growth – in many regions, renewable projects are bottlenecked due to transmission and siting issues.

Meeting growing demand for energy will require being efficient with resources we already have – and leveraging flexible resources like demand response to manage load growth.

Assumed large load demand by region

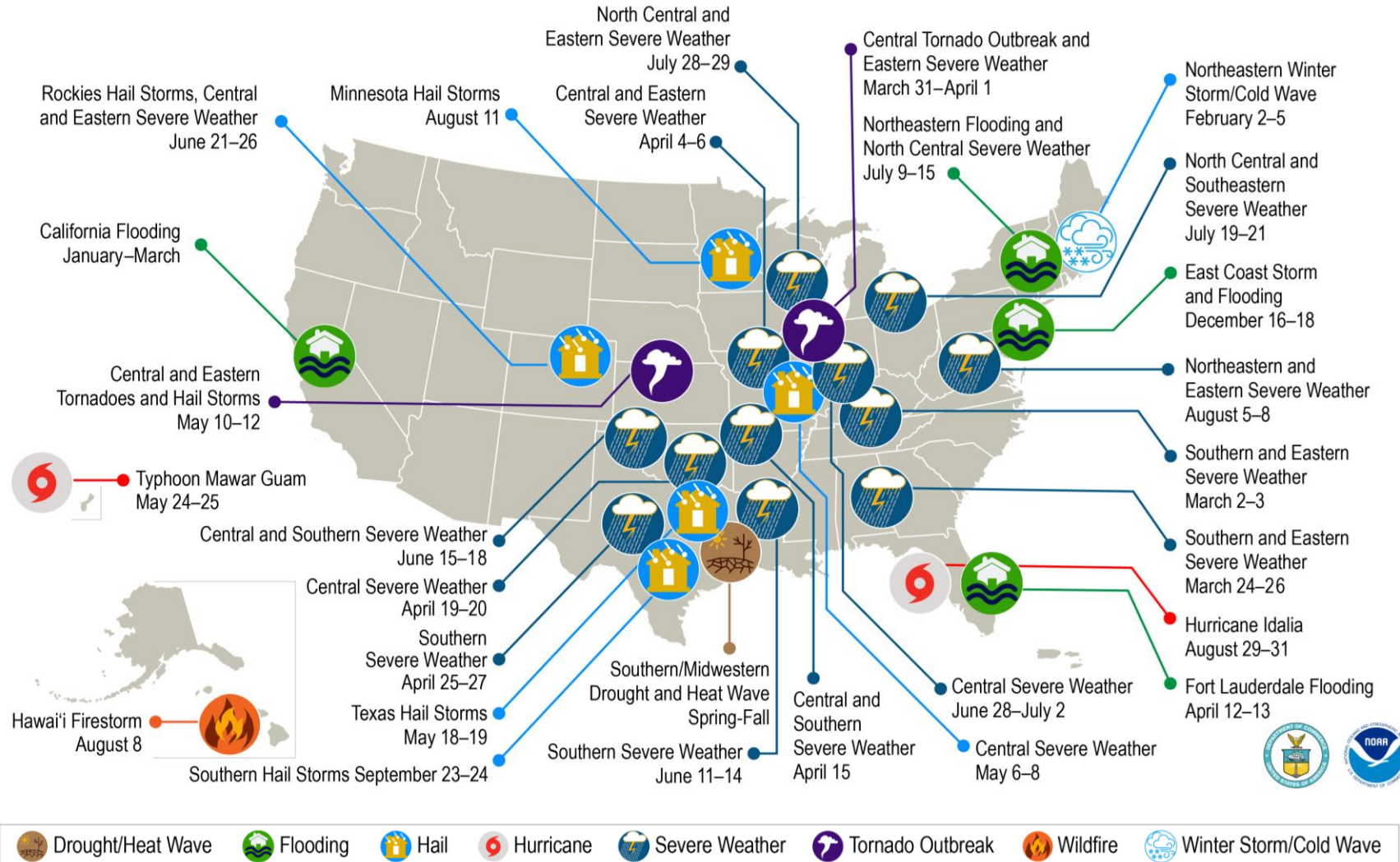


NOTE: large load includes both data centers and manufacturing (battery, PV, semiconductors)
SOURCE: North America power markets strategic planning outlook: Base case; Wood Mackenzie:
<https://my.woodmac.com/document/150040204>

An increase in extreme weather is straining the grid



Sustainability is imperative to address climate change – 2023 figures



In 2023, the United States experienced a record 28 separate weather or climate disasters that each resulted in at least \$1 billion in damages.

This number of events surpassed the record of 22 from 2020.

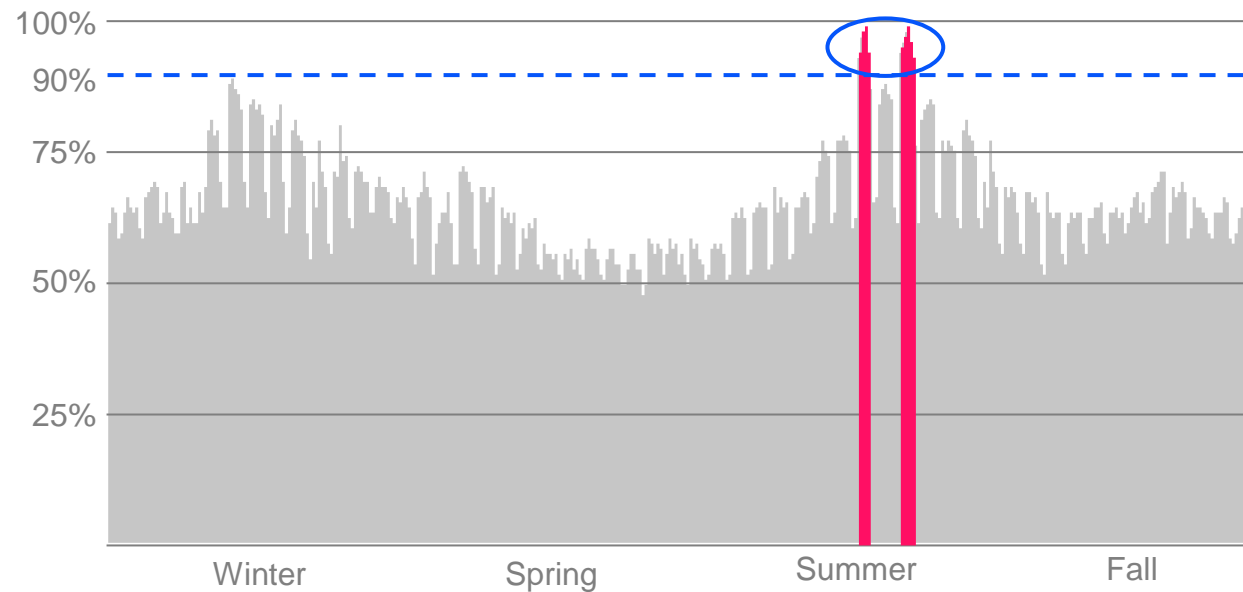
Flexible resources, like demand response, are needed now more than ever for grid stability.

Graphic courtesy NOAA Climate.gov
<https://www.climate.gov/news-features/blogs/beyond-data/2023-historic-year-us-billion-dollar-weather-and-climate-disasters>

Being efficient with existing assets is a cost-effective alternative to building new power plants



Annual electricity demand as a percent of available capacity



The grid is changing, and evolving technology and climate change require new strategies from grid operators.

More than 10% of grid infrastructure costs are spent to meet peak demand that occurs **less than 1% of the time.**

Utilizing existing assets (e.g., load flexibility) can help to increase grid flexibility and system reliability, at lowest cost.

Strengthen the grid



Earn payments



Improve operational reliability



Increase sustainability



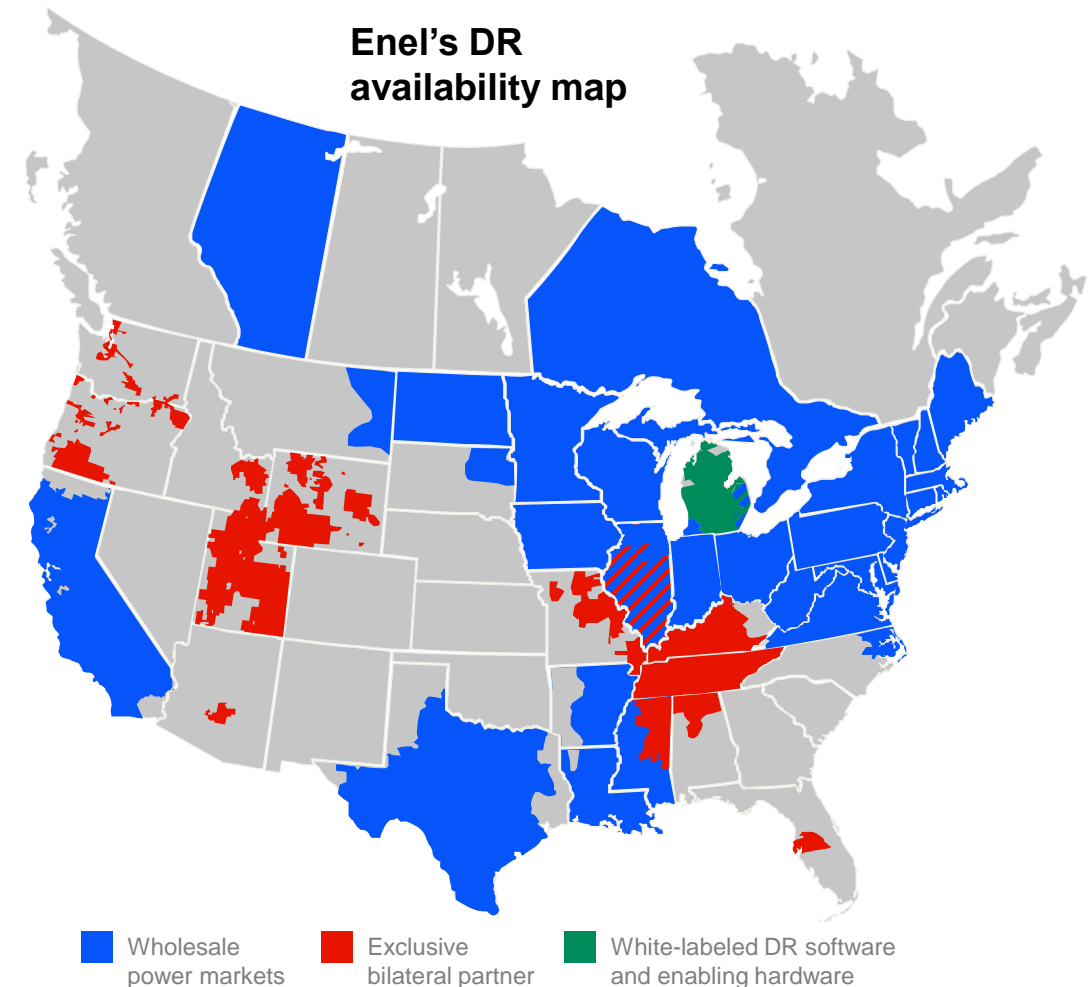
An increasing number of ISOs are recognizing energy flexibility as a balancing tool



At the regulatory level, managing demand-side resources and flexible loads is a recognized piece of the puzzle to support grid stability and load growth

- As such, grid operators are launching **demand response programs**, enabling aggregation of flexible resources – one of the latest states to approve aggregation is Wisconsin, for example
- Some utilities are even partnering 1:1 with demand response aggregators, like Enel, to **launch exclusive demand response programs** to their customers to offer support at a localized level

However, there's still much work to do to promote the value of DR in regions where C&I DR programs do not currently exist





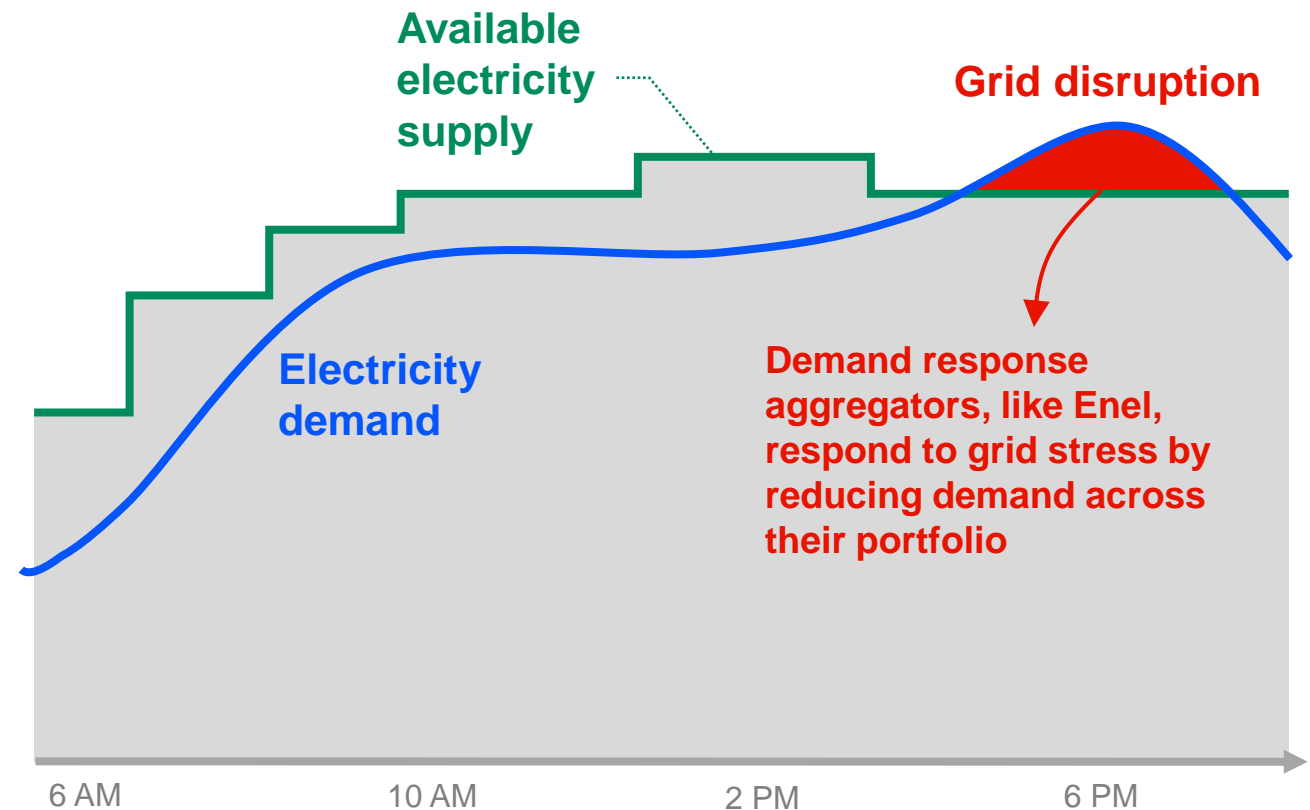
Demand response (DR) 101

Demand response programs are essential, flexible grid reliability tools



Balancing supply and demand on the electricity grid is difficult and expensive

- **Participating companies earn payments** for reducing energy usage in response to grid emergencies
- Grid emergencies and peak demand can be due to extreme weather, wholesale price spikes, or unexpected system issues



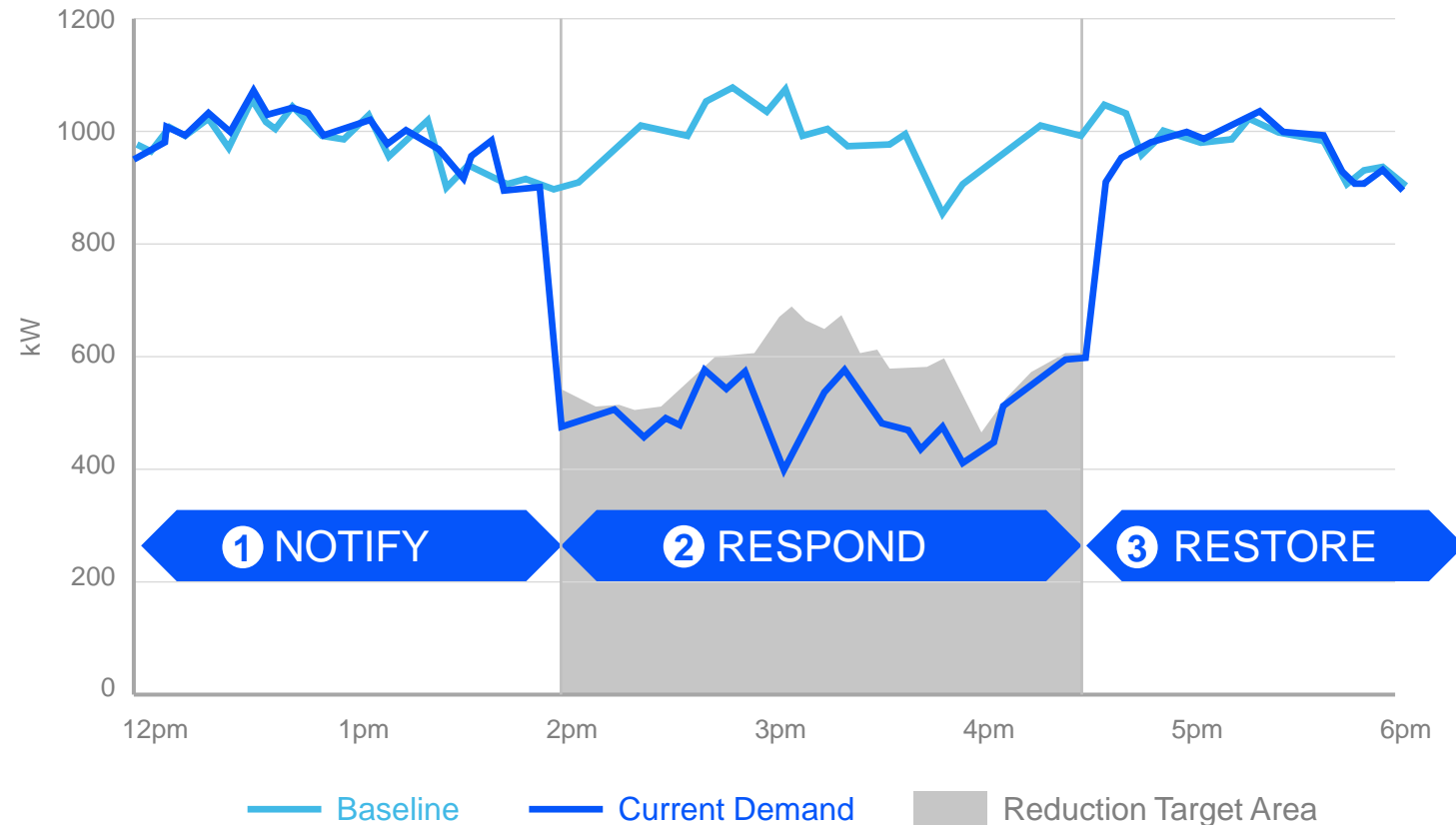
How demand response participation contributes to energy conservation



Demand response programs involve energy consumers being **flexible** with how they use energy, with a goal to **conserve energy** during times of grid stress.

When alerted of an upcoming demand response event, participants **reduce their energy consumption to a pre-determined amount** and remain at that level for the duration of the event.

Fossil fuels are commonly used at times of high demand, so every kW/MW reduced during this time **counts toward avoided emissions.**



Market highlight: PJM

Rising demand is a factor that drives capacity prices to skyrocket in their recent capacity auction for the 2025/26 delivery year – and energy conservation will be rewarded



Decline in supply

Fossil-fuel powered plants that PJM has relied upon are retiring without replacement generation assets ready, and new resource accreditation rules with derates resulted in less capacity offered



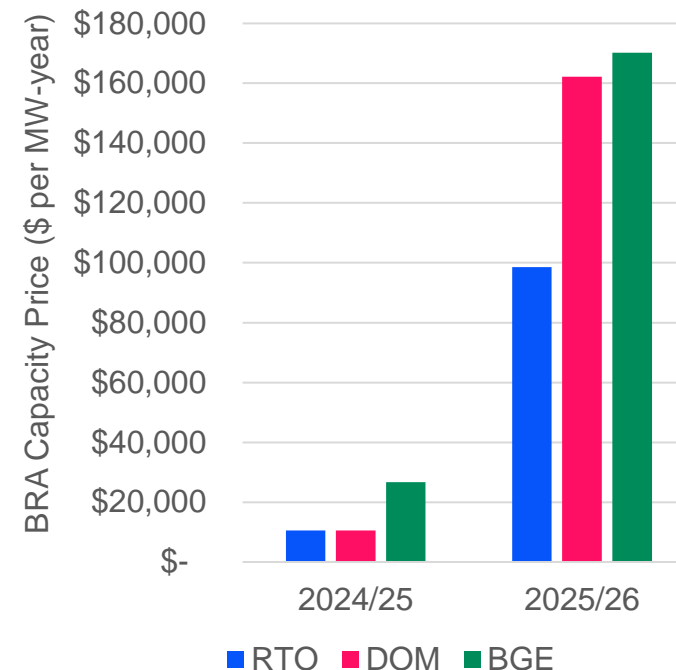
Rising demand

Demand for energy is rising due to new data centers, increased electrification, etc. – and PJM forecasts demand will continue to rise over the next 15 years



Shrinking margin

The resulting supply and demand balance is the tightest in years – PJM's Reserve Margin is at uncomfortably low levels to ensure reliability



These factors resulted in the highest capacity prices the market has seen – encouraging more generation to come online and massively incentivizing participation in flexibility programs like demand response to provide capacity to the grid.

Recent examples showcasing the importance of demand response in modern energy management

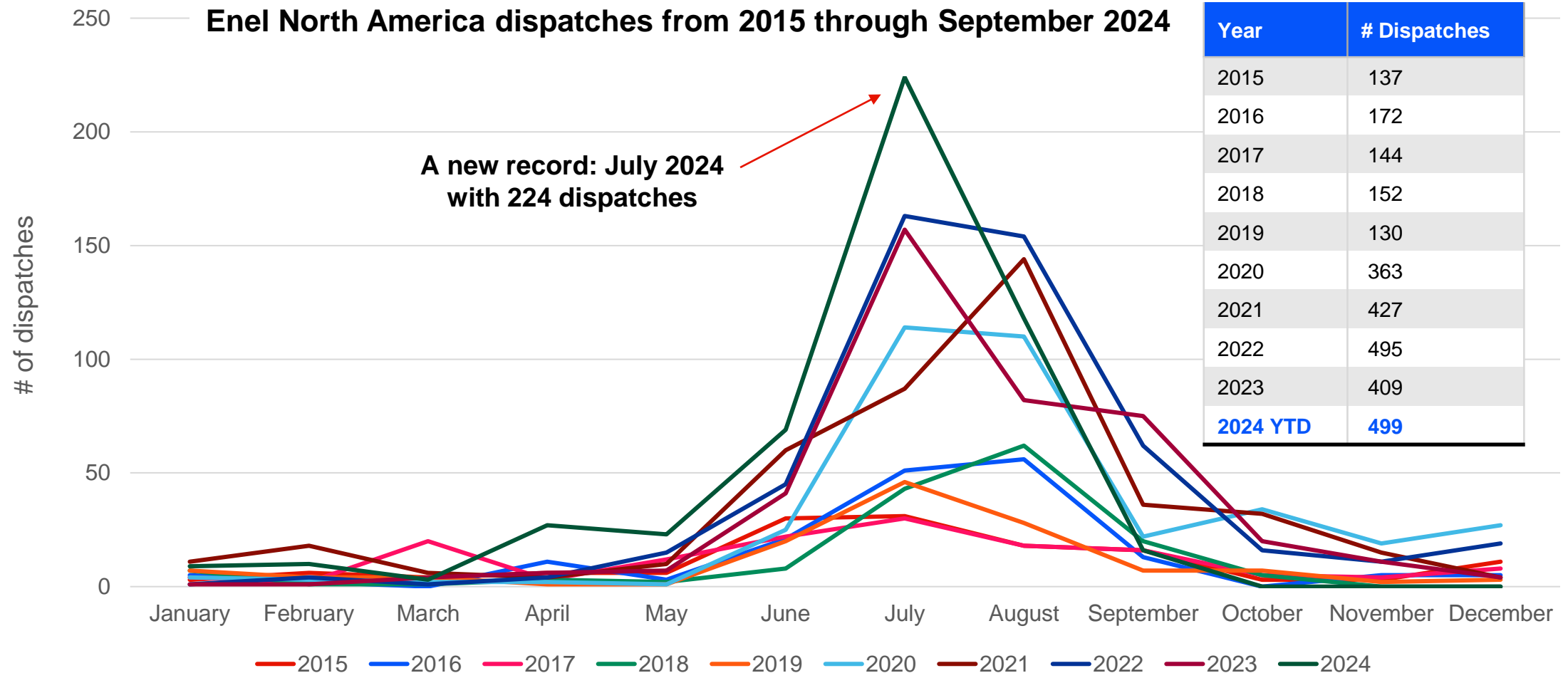


Demand response **lowers the likelihood of forced grid outages** that can impose significant financial costs and inconvenience on communities

- This flexible resource **can be dispatched quickly** to address any imbalances between electricity supply and demand
- DR programs **reduce costs** for all customers and strengthen the reliability of the electric grid

- **September 2022:** DR resources responded to disruptions driven by severe heat in California
- **December 2022:** Winter Storm Elliott brought extreme cold across the Midwest and Northeast, causing natural gas wells to freeze – emergency DR events were called by PJM, ISO-NE, and TVA, many of these events lasting hours
- **July 2023:** ERCOT was pushed to its limits as reserves ran low during a massive heat wave – DR provided critical load relief
- **Summer 2024:** A formidable heat dome settled over a significant portion of the nation, driving temperatures to levels not seen in 30 years – ISOs across the US leveraged DR in their action plan to ensure grid continuity as demand skyrocketed

The grid needs demand response now more than ever, as we are witnessing with dispatch activity



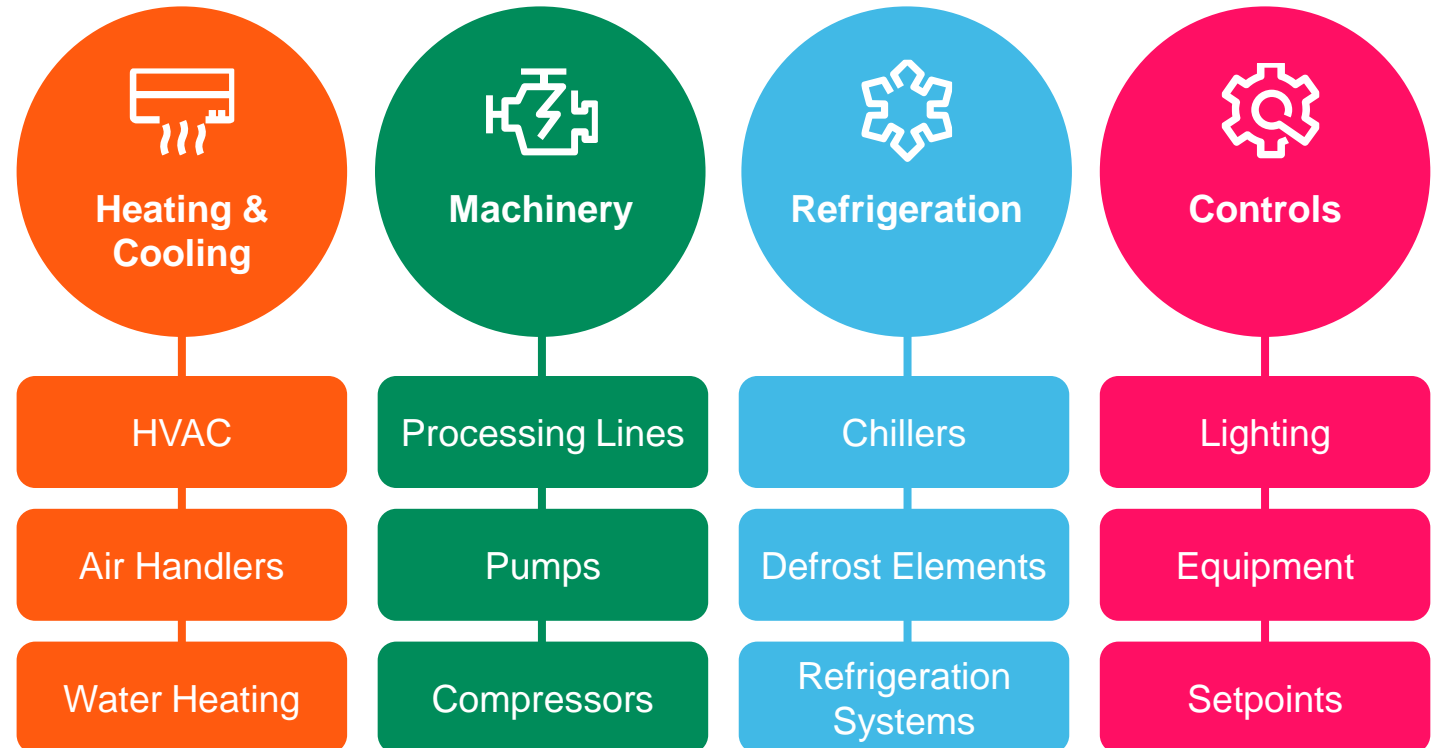
Demand response participation is achieved with flexible and efficient utilization of existing assets



A wide variety of assets at your facility can be leveraged in a flexible manner to reduce or shift consumption.

- Some facilities shut down all processes during demand response events
- Others focus on a few assets to minimize operational disruption

Working with a demand response partner can help you identify assets to incorporate into your curtailment plan



What types of companies are good candidates for demand response participation?

- ✓ C&I companies with **large energy demands and predictable loads** make excellent DR candidates (e.g., manufacturing, cold storage, data centers, mining are a few).
- ✓ You can make energy reductions **without significantly disrupting core operations.**
- ✓ You can reduce your load by at **least 100 kW** during an event. However, the more you reduce, the more you earn – for instance, large industrials can typically curtail several MW.
- ✓ If you have a Building Management/Automation System (BMS or BAS), you can actually **automate how you participate.**



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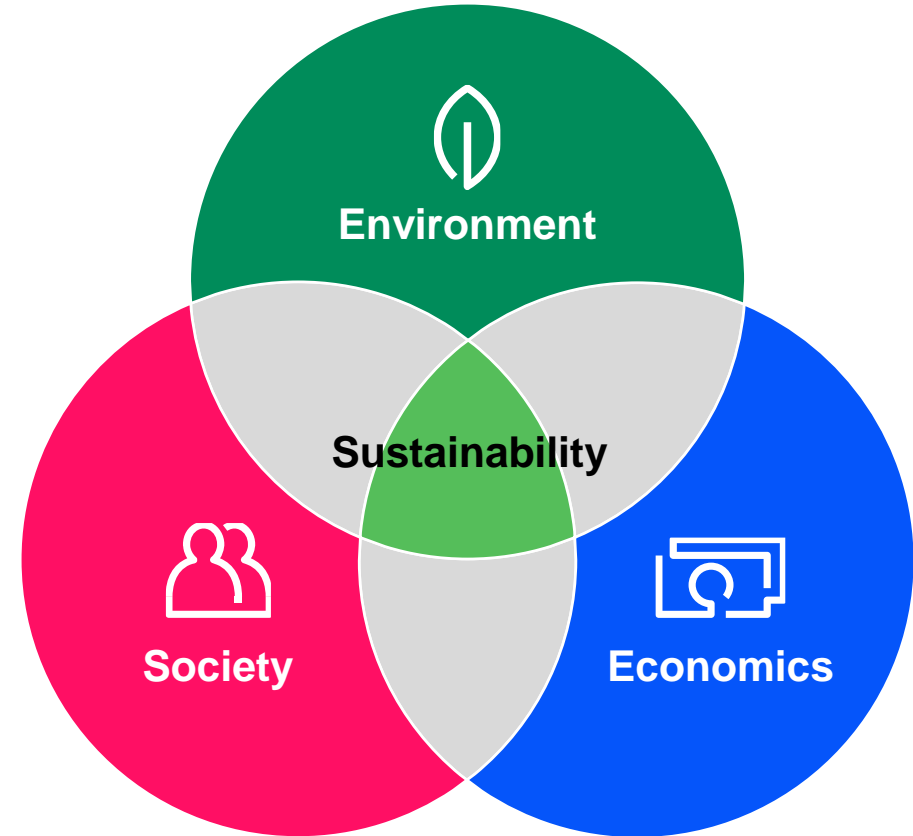
Corporate sustainability strategy 101

Defining corporate sustainability

How decarbonization is becoming a top priority for organizations' sustainability goals



- What is corporate sustainability?
- Mapping high-priority issues relevant to organizations and their stakeholders
- Risks and opportunities in today's rapidly evolving sustainability landscape
- Immediate and growing focus on decarbonization and low-carbon business models
- Target-setting, goals, claims and communications



How energy and sustainability are intertwined



Your energy strategy plays a central role in advancing your sustainability goals



Economic benefits

Cut energy costs and generate revenue.



Resource conservation and energy efficiency

Use resources more efficiently and minimize waste, while also lowering costs.



Legal and financial risk

An effective energy strategy ensures compliance with regional GHG reduction, sustainability regulations and policies, reducing legal and financial risks.



Reducing carbon emissions

Enable new renewable energy to come online, reduce Scope 2 emissions, and meet decarbonization targets.



Beyond megawatts

Clean energy partnerships and sustainability initiatives can maximize social impact in local communities; an example is Enel's Creating Shared Value business model.



Resilience

Build resilience in the face of disruptions caused by extreme weather events, reducing vulnerabilities in the energy grid.

Complexities in carbon accounting and reporting



Evolution from voluntary to mandatory reporting standards

Marcus talk about # of customers, companies and investors

U.S. & Europe



- European Sustainability Reporting Standards (ESRS)
- EU Corporate Sustainability Reporting Directive (CSRD)

Global



- International Financial Reporting Standards (IFRS)
- International Sustainability Standards Board (ISSB)



Financial Reporting

Financial statements

Information about the reporting entity's assets, liabilities, equity, income and expenses

Sustainability disclosures for the financial markets

- Information outside the financial statements that assists in the interpretation of a complete set of financial statements or improves users' ability to make better economic decisions
- Financial risks/opportunities related to the impacts on the reporting entity's activities
- Financial risks/opportunities unrelated to the impacts of the reporting entity's activities

Sustainability Reporting

Qualitative and quantitative information about an organization's impacts on the economy, environment and people

Understanding scope 1, 2, and 3 emissions

Scope 1: Emissions your organization makes directly (e.g., running energy assets at facilities, operating vehicles)

Scope 2: Emissions your organization makes indirectly (e.g., purchased electricity)

Scope 3: Emissions not associated with your organization but that you are indirectly responsible for through your value chain



Upstream Partner
Scope 3

Reporting Company
Scopes 1 & 2

Downstream Partner
Scope 3

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Why demand response should be part of your decarbonization strategy

A complex energy landscape means available solutions are becoming more complex



With many strong currents and moving parts, the clean energy landscape and available technologies are evolving and getting more complex to comprehensively address the unique challenges organizations face.

Available technologies:



On-site and off-site energy solutions



Solutions that reduce operational costs



Solutions that reduce carbon emissions



Solutions that unlock revenue opportunities

Market factors to consider:



Available incentives



Procurement



Supply chain issues



Regulatory changes

With all of these technologies and market factors to consider, where do you even begin? **With the low-hanging fruit...**

Why demand response is a low-hanging fruit to integrate into your roadmap

1. Unlike complex and capital-intensive projects, DR:

- Can be implemented at your site **quickly and cost-effectively**
- Requires **relatively little** infrastructure at your site – it leverages existing assets for participation

2. DR creates a valuable revenue stream

- **No upfront costs to participate** – leverage earnings to invest in on-site renewable projects that may require capital
- DR revenue can finance a BMS or BAS that can **amplify energy efficiency benefits across your facility** (Enel's FlexUp solution is an example)

3. DR works seamlessly with other solutions

- **Energy efficiency upgrades** – orchestrating these assets with a BMS drives further efficiencies and automates DR participation
- **Solar + storage** – exercise flexibility and amplify decarbonization by utilizing stored renewable power during DR events



Benefit: greener peak capacity, lower carbon footprint

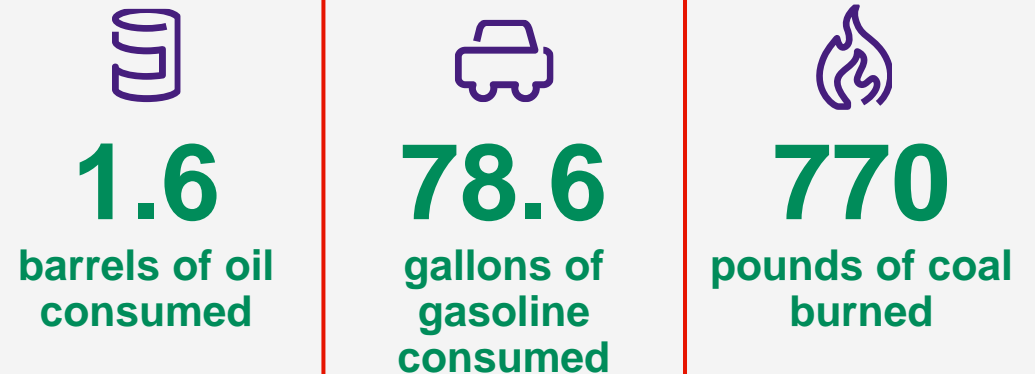


Being efficient with existing resources reduces the need for the grid to fire up carbon-intensive power generation during times of peak demand

Demand response relies on people, not power plants, to reduce electrical demand during times of grid stress

- Shifting away from costly, fossil-fuel powered peaker plants as peak power sources results in **ratepayer savings, emissions intensity improvements¹**, and **improved air quality** for local communities
- These efforts **reduce your own carbon footprint** by avoiding grid energy at times when fossil fuels are burned to power these peaker plants

Dispatching just 1 MWh of demand response is equivalent to replacing the CO₂ emissions of:



Source: US EPA Greenhouse Gas Equivalencies Calculator (July 2024)

¹<https://www.pwc.com/gx/en/issues/esg/transforming-energy-demand.pdf>

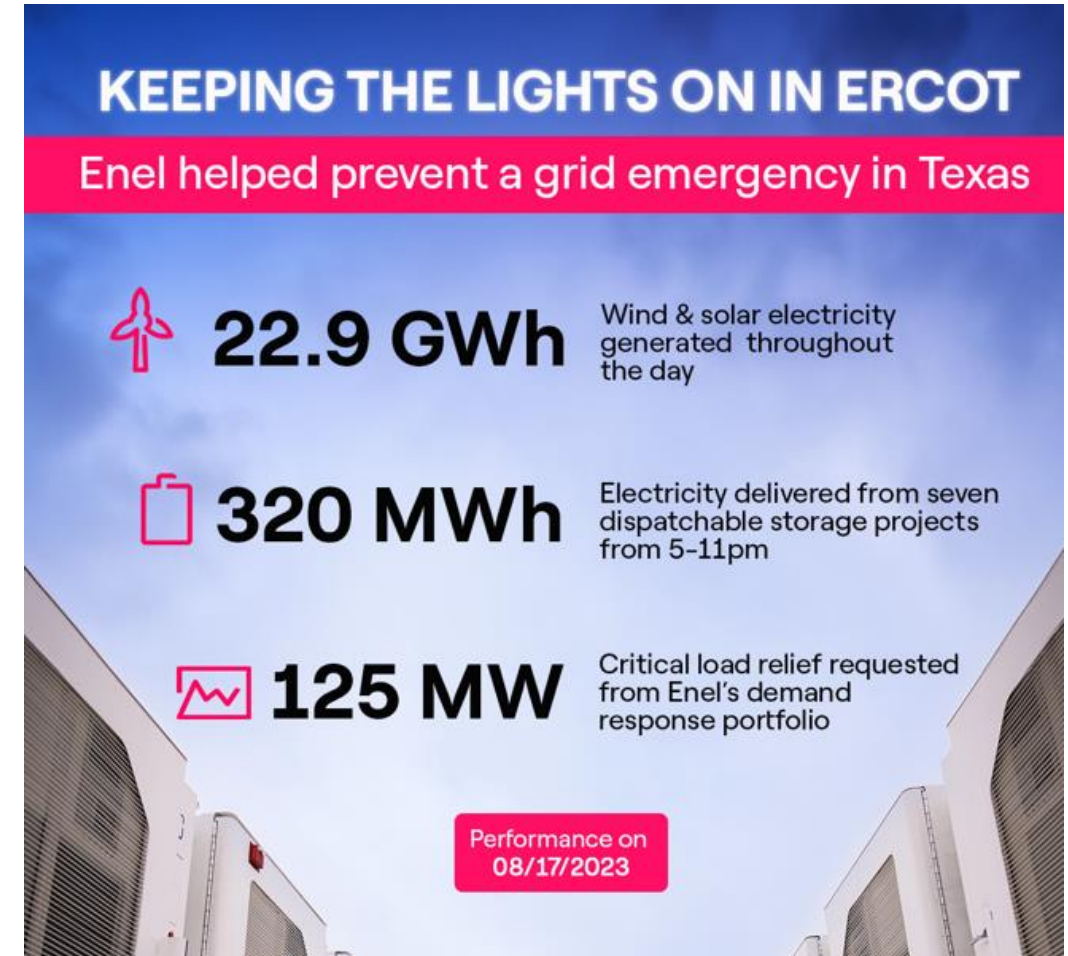
Benefit: enable renewable energy integration

Clean, flexible power – advancing the energy transition and ensuring grid reliability



Energy flexibility is becoming more important as fossil-fuel generation is decommissioned and more renewable energy projects come online

- **Renewables like wind and solar PV are essential** to the energy transition, but generation varies depending on the weather and time of day
- DR has become an increasingly important tool for **demand flexibility**
- DR resources can be **deployed quickly** to respond to variation in wind and solar power to ensure the grid remains in balance
- With coal-fired plants retiring in many ISOs and a large number of renewable projects stuck in interconnection queues, **DR can provide needed capacity** to fill the supply/demand gap



Benefit: drive efficiencies with real-time data

Enhance your awareness of your energy infrastructure



Demand response helps you identify energy efficiency opportunities and create new consumption behaviors.

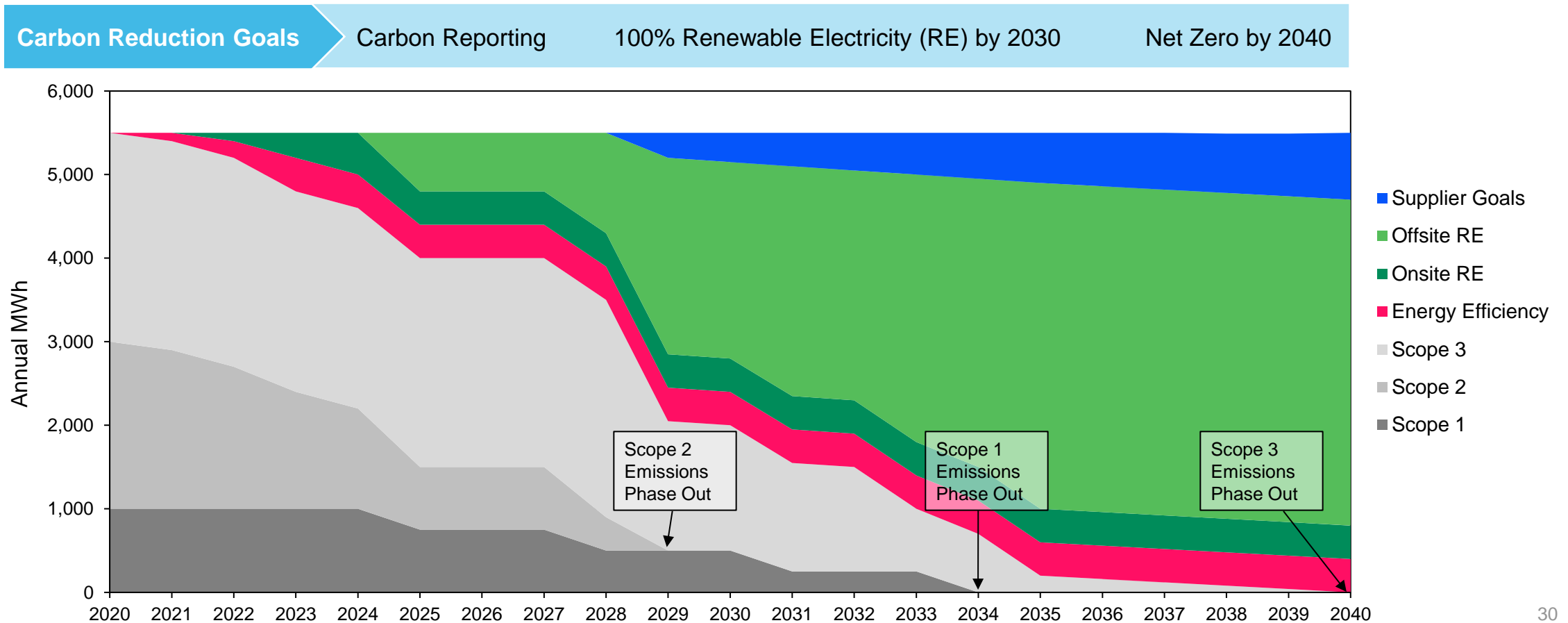
- Metering enables you to **view data in real-time** and optimize performance
- Building Automation Systems (BAS) and Building Management Systems (BMS) can **significantly unlock more opportunity**
 - Improve efficiency and drive cost savings
 - Optimize on-site operations
 - Automate and improve DR performance
 - Increase MW enrollment in DR = higher value to the grid and more earnings
 - Don't have a BMS? With Enel's FlexUp solution, we can help you install one with zero-upfront cost.



These benefits show that DR can serve as the backbone of your decarbonization strategy



Example decarbonization roadmap, with energy efficiency & DR implemented first



Demand response is a win-win



Energy flexibility is lucrative for you, essential for the grid, and beneficial for the planet. Participation unlocks quick wins to drive your decarbonization roadmap forward.



Earn new revenue

Grid operators incentivize organizations to be more flexible with energy usage – instead of firing up peaker plants, **the grid pays you to conserve energy**



Reduce energy costs

Demand response participation helps you **identify** energy efficiency opportunities, **reduce** energy use, and **create** new consumption patterns across your facility



Carbon reduction

Avoid drawing energy from the grid at times when fossil fuels would have to be burned to power peaker plants – translating into kW or even MW you can attribute to carbon reduction efforts

The most straightforward solution for addressing peak demand and reliance on fossil fuels is to reduce that demand. The cleanest energy is the energy we save.

Want to dive deeper?

Additional resources for sustainability and decarbonization strategies




**Decarbonization navigator:
a toolkit for organizations**

A step-by-step guide to selecting the right energy strategy and solution mix to accelerate your decarbonization journey wherever you are



Our practical guide is tailored to your organization's current state – whether you are just starting, looking to take your strategy to the next level, or are well along in your journey and looking to optimize.



**Demand response: is this
low-hanging fruit part of your
decarbonization strategy?**

Learn how flexible energy use can be a path to profit, lower emissions, and a more sustainable electric grid.



Our new eBook dives deeper into why demand response is a low-hanging fruit that belongs in your decarbonization roadmap, regardless of where you are in your journey.

Or get in touch with our team to discuss your options! [Fill out the form here.](#)



Q&A



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Thank you!

