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GCPA
Gulf Coast Power Association

GCPA 38th Annual Fall Conference

October 3 - 4, 2023
AT&T Conference Center, Austin

Virtual Power Plants

A National Perspective on Demand-Side Resilience and Flexibility Products

Arushi Sharma Frank
Sr. Counsel & US Energy Markets Policy Lead, Tesla

GCPA Pre-Conference Kickoff Workshop: October 2, 2023

Federal	Dodd-Frank Implementation for gas and power utilities, power marketers – volumetric options, commodity-based swaps, ISO/RTO Exemption from Commodity Exchange Act/Dodd-Frank, cross-market manipulation/deceptive practices, exchange-based products, financial transactions Appointee under Gensler and Massad Commissions, CFTC Energy & Environmental Markets Advisory Committee EPA Subpart W, Waters of the US rulemakings & litigation, Clean Air Act, Clean Water Act, Endangered Species Act (Incidental Take Permits, Habitat Conservation Plans), FERC Wholesale Price Formation, Interconnection, Gas-Electric Coordination, MISO PRA, CAISO EIM, ISONE FCM FERC Natural Gas Certificate proceedings, environmental reviews (EAs, EIS) FERC/ISO Reactive Power Tariff & Technical Compliance (D-Curve ISO Reporting, Reactive Power Compensation, Power Factor Compliance) Natural Gas Infrastructure Permitting, Executive Order 13604 Implementation Policy Qualifying Facilities Certification and Compliance, PURPA Implementation and Reform Social Cost of Carbon
State/Regional	Green-E and RECs/EAC Compliance in ISOs/RTOs Investor-owned utility rate design (gas and electric), shipper must have title (Natural Gas Act), PUCHA and FPA (Federal Power Act) ISO/RTO Generation Operations and Trading Compliance (Nuclear, Thermal, Renewables) – AESO, CAISO, ERCOT, ISONE, NYISO, ONIESO,MISO, PJM, SPP ISO/RTO Market Design – Capacity Markets Natural Gas Hydraulic Fracturing NERC Compliance, GO and GOP (Thermal, Wind); Natural Gas and Nuclear Plant Operating Procedures Virtual Power Plant: ISO/RTO market design, Investor-owned and public utility program design & regulatory constructs Vice Chair of PUC Texas ADER Task Force (2022- Present)
Legal/ Regulatory	ISO and Market Monitor RFIs & Investigations FERC & PUC TX Enforcement Retail and Wholesale Commodity PPAs – Renewable Single-Source Procurements, Renewable Energy and Renewable Attributes Deregulated energy businesses: wholesale and retail licenses, registration, operations compliance FERC & ISO/RTO Standards of Conduct

Speaker Bio
(Topics I Will Discuss for Hours if Prompted)

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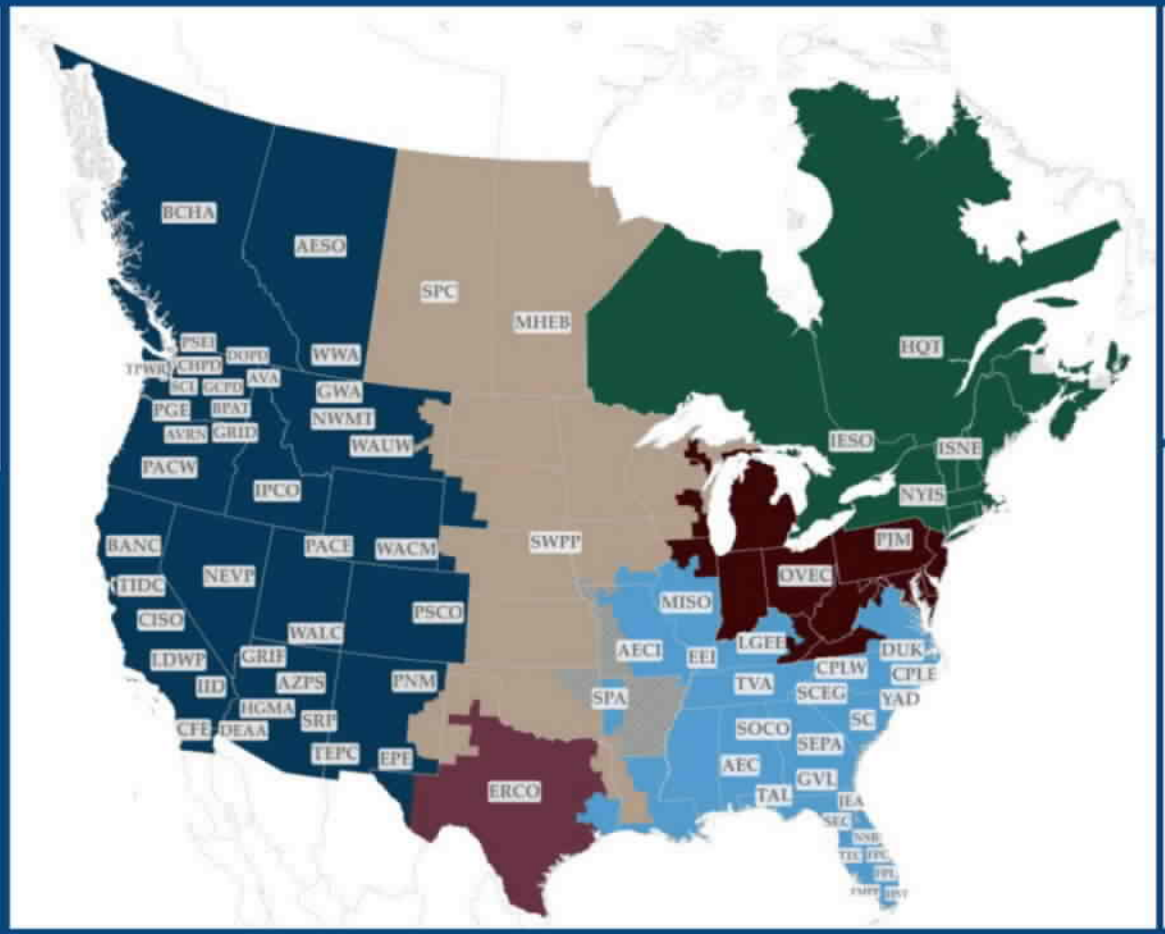
5 Ways to View the "National" Grid

Bulk Power System

NERC Reliability Coordinators

Balancing Authority Areas



NERC Regional Entities

ISO/RTO Markets

https://www.wecc.org/epubs/StateOfTheInterconnection/Pages/Western-Interconnection.aspx

Audience Poll

What worries you the most about the state of the national grid?

- We can't handle climate events
- Transmission/Electricity Delivery Costs are too high and growing
- We have too many different market structures and no standardization
- We don't have cheap, dependable ways to stay comfortable in extended outages
- Electrification is too costly
- Grid is vulnerable to malicious attack or foreign influence

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

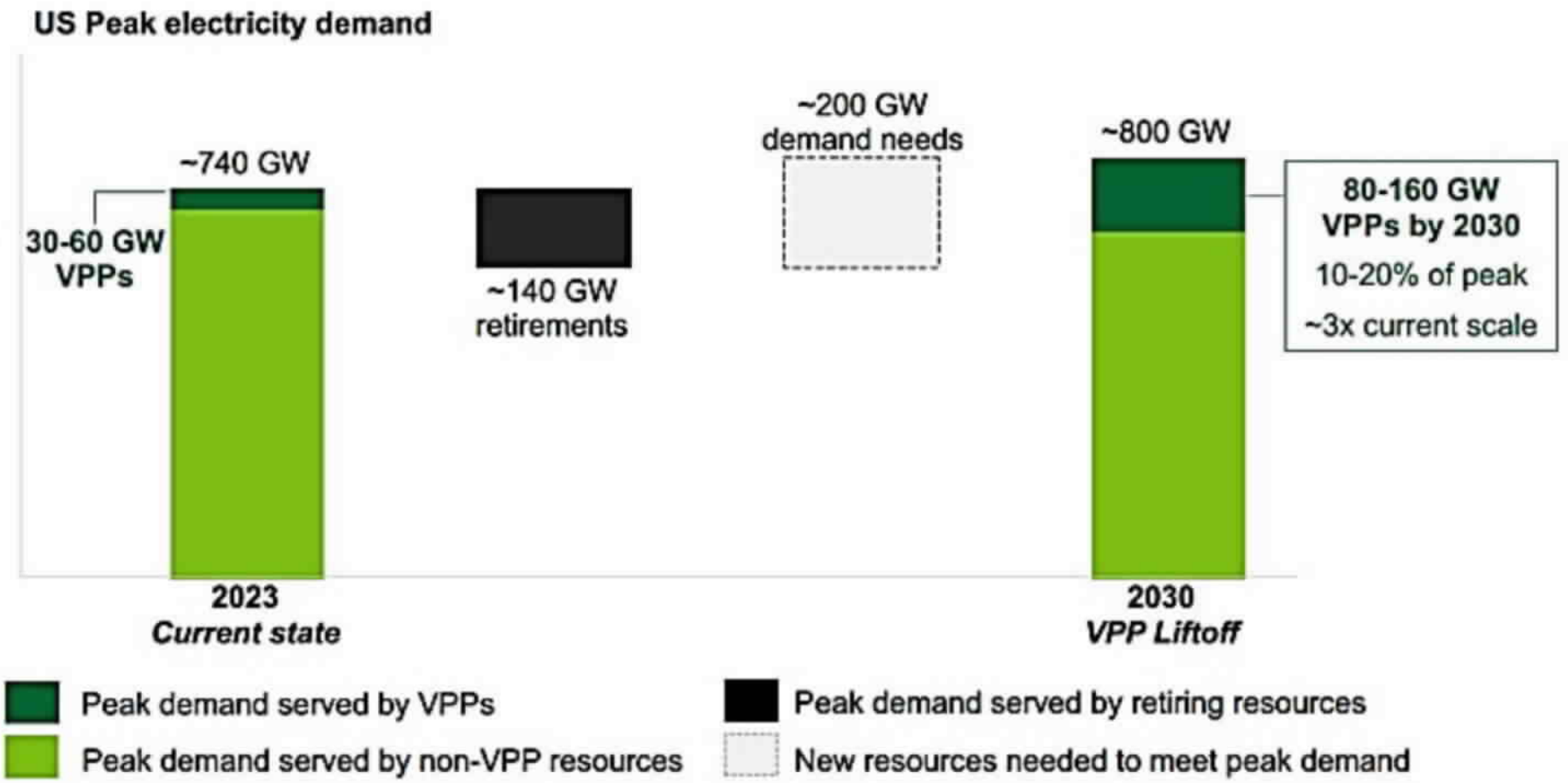
2022 Long-Term Reliability Assessment

~~Good~~ Bad News! Your Concerns are all Equally Valid!

Finding: Parts of the North American BPS face resource capacity or energy risks as early as the summer of 2023 (Figure 1). Capacity deficits, where they are projected, are largely the result of generator retirements that have yet to be replaced. While some areas have sufficient capacity resources, energy limitations and unavailable generation during certain conditions (e.g., low wind, extreme and prolonged cold weather) can result in the inability to serve all firm demand.

Peak Demand and Energy Growth: Projected growth rates of electricity peak demand and energy in North America are increasing for the first time in recent years. Government policies for the adoption of electric vehicles (EVs) and other energy transition programs have the potential to significantly influence demand. Demand-side management programs, including conservation, EE, and DR continue to offset demand and contribute to load management. Where rapid transition is proposed, early alignment and coordination on energy and infrastructure are needed.

VPP liftoff



Notes: 2023 VPP capacity based on estimates from Wood Mackenzie (2023) and FERC (2021). 2030 VPP capacity potential and savings potential based on industry interviews and analysis by The Brattle Group (2023) and Clack et al. (2021). See footnote 1 for detail on asset retirements and peak growth estimates.

(Source: VPP Liftoff Report, 2023, Department of Energy)

Reserve Margins Risk Nationwide within 10 Years

Maintaining adequate reserve margins is an essential function of the RTOs/ISOs; operators must meet their obligations to deliver electricity when system disruptions occur, or when peak demand exceeds obligated load.

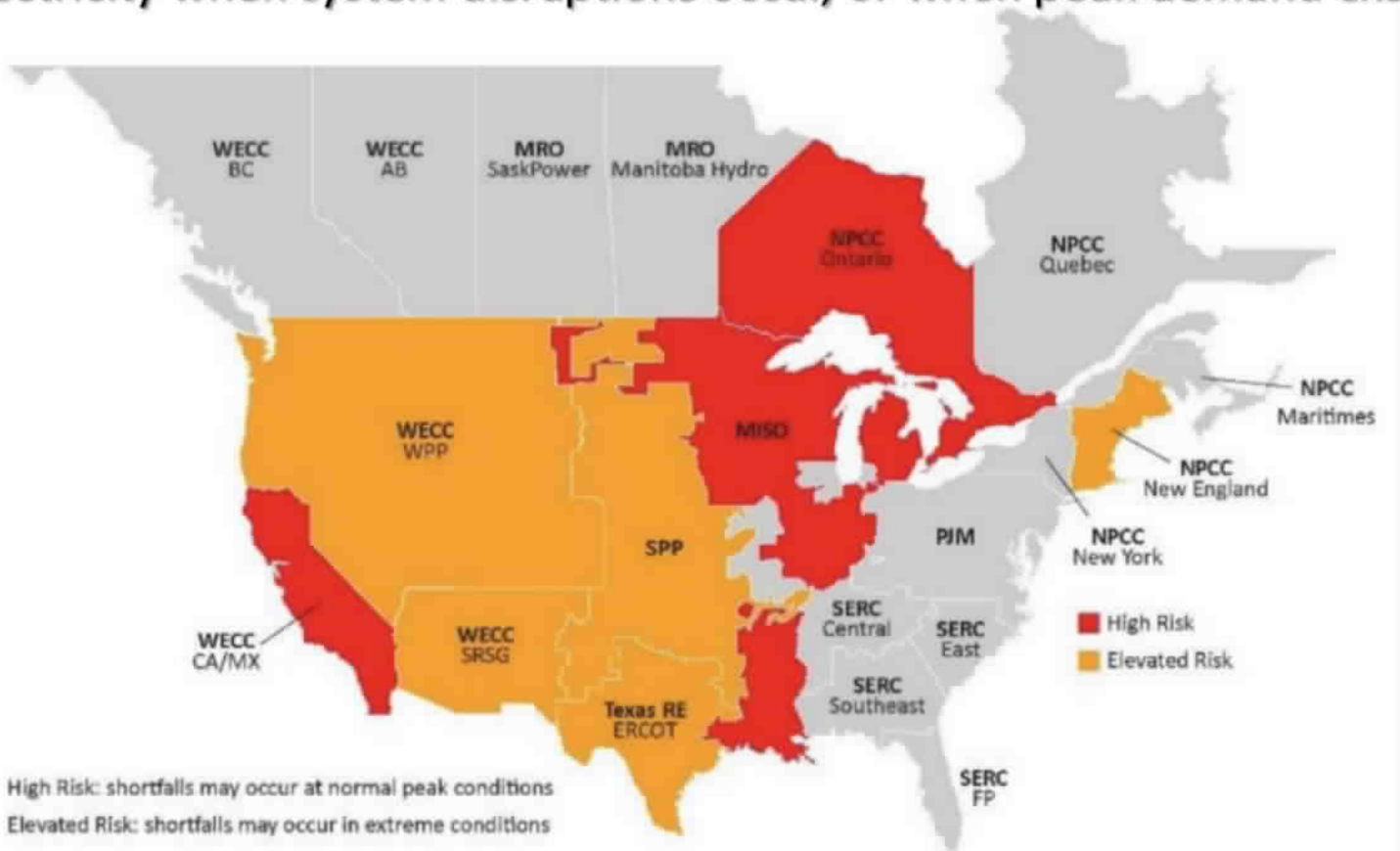


Figure 1: Risk Area Summary 2023–2027

NERC's Long Term Reliability Assessment illustrates the risk status of certain regions between 2023-2027.

Elevated Risk means long-duration weather events increase the risk of electricity supply shortfalls. In many parts of North America, peak electricity demand is increasing, and forecasting demand and its response to extreme temperatures and abnormal weather is increasingly uncertain.

Representative Findings – NERC December 2022 Long-Term Reliability Assessment	
U.S. West	Has increasing demand and resource mix variability. In normal conditions, the expected demand and resource variability is balanced across the area as excess supply from one part of the system is delivered through the transmission network to places where demand is higher than supply. However, **more extreme summer temperatures** that stress large portions of the Interconnection reduce the availability of excess supply for transfer while also **reducing the transmission network's ability to transfer the excess**.
ERCOT	Reliability during extreme winter weather remains a concern in Texas. ERCOT's **winter peak load varies substantially (as much as 12.5%)** between the coldest temperatures of an average year and a more extreme year as might be experienced once per decade. A high number of forced outages of the thermal and wind generation fleet have been an issue in severe winter weather. Improved generator availability resulting from winter preparedness programs and reforms implemented by Texas regulators, ERCOT, and Generator Owners since February 2021 are expected to reduce the risk that electricity supplies will be insufficient during a severe winter storm.
New England	In New England, **limited natural gas infrastructure** can impact winter reliability due to **increased heating demand** and the potential for supply disruptions to generators. Liquefied natural gas facilities and sufficient generators with stored backup fuels are critical to electric reliability.
SPP	**SPP is exposed to energy risks in ways that are similar to both Texas and the U.S. West**. Severe weather in SPP is likely to cause high generator outages and poses a risk to natural gas fuel supplies. In addition, the penetration of wind generation makes the **resource mix variable and exposed to insufficient energy** during low wind periods.
Accommodating Large Amounts of Distributed Energy Resources	**Preparing the grid to operate with increasing levels of distribution resources** must also be a priority in many areas. **Solar photovoltaic (PV) DERs are projected to reach over 80 GW by the end of this 10-year assessment**, a 25% increase in projection since the 2021 LTRA; a total of 12 assessment areas project to double the amount of DERs in their areas by 2032.

Energy, Climate, and Grid Security Hearing: "Powering America's Economy, Security, and Our Way of Life: Examining the State of Grid Reliability“

September 28, 2023, 9:30am CDT | 2322 Rayburn House Office Building

Gordon van Welie, *President & Chief Executive Officer, ISO New England*

Paul Suskie, *Executive Vice President, Regulatory Policy & General Counsel, Southwest Power Pool*

Richard J. Dewey, *President & Chief Executive Officer, New York ISO*

Todd Ramey, *Senior Vice President, Markets and Digital Strategy, Midcontinent ISO*

Woody Rickerson, *Senior Vice President & Chief Operating Officer, ERCOT*

Neil Millar, *Vice President for Infrastructure and Operations Planning, California ISO*

Frederick S. Bresler III, *Senior Vice President – Market Services, PJM Interconnection, LLC.*

“Once almost unthinkable, we must now plan for 'once in a century' extreme weather events on a continual basis,“ - Paul Suskie, SPP

Projections show a doubling of average power demand and a tripling of winter peak demand in New England by 2050 - Gordon van Welie, ISO New England

PJM, the nation’s largest wholesale market, warned of decreasing reserve margins, needs to slow down the pace of generation retirements to avoid reliability problems by the end of the decade – Manu Asthana, PJM CEO

Testimony Available at https://energycommerce.house.gov/events/energy-climate-and-grid-security-hearing-powering-america-s-economy-security-and-our-way-of-life-examining-the-state-of-grid-reliability

Four themes shaping the future of the stormy European power market

January 27, 2023 | Article

Demand for electricity in Europe is surging at a time when supplies are disrupted. To adapt to the market's uncertainty and rising prices, players will have to be clear-eyed about what's ahead.

The **war** in Ukraine**, disruptions to nuclear facilities** in France, and **low output from hydroelectric plants** have combined to significantly reduce the continent's dispatchable power.... Primarily driven by **drought**, hydro output was down by 19 percent between January and September 2022 across Europe, compared with the same period in 2021. In France, where **32 of the country's 56 reactors were down for maintenance in September**, nuclear energy output has declined by 14 percent over the same period...Even more destabilizing is the **dwindling supply of Russian gas**. Prior to the invasion of Ukraine, Russia supplied 30 percent of Europe's natural gas... dropped to 15 - 20 percent in 2022 and is likely to decline further.

REINDUSTRIALIZATION, DECARBONIZATION, AND PROSPECTS FOR DEMAND GROWTH

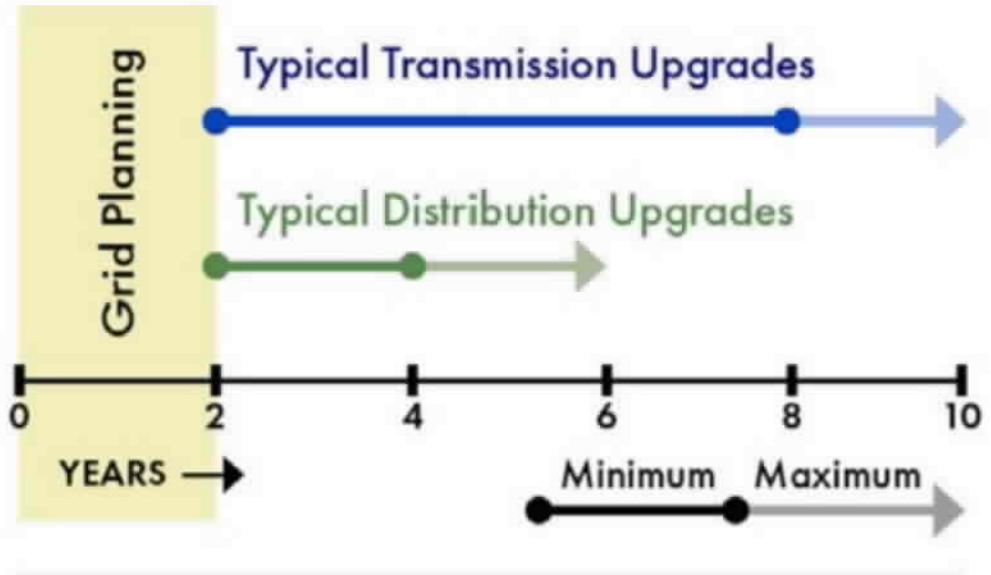


Figure 6—Timeline for Typical US Grid Reinforcement Projects

Referred to as ***point loads*** in this paper, these facilities are sited based on business and policy environment, resource proximity, workforce availability, and other factors, and they may seek access to 100% renewable energy on an annualized basis, carbon-free energy on a 24/7 basis, or extremely high levels of service reliability and power quality. Manufacturers also may request grid upgrades on accelerated schedules—shorter than typical timelines for transmission and distribution system expansion projects as shown in Figure 6—to capitalize on government incentives or meet other objectives.

Manufacturing plants and other new point loads can have disruptive impacts at local and regional levels, creating challenges for grid planners and other stakeholders. Proactive and comprehensive load forecasting and resource planning are required based on higher-resolution modeling and analysis, and increased coordination among electricity providers, manufacturers, system operators, development agencies, regulators, and other stakeholders is essential to ensure that significant new loads can be served efficiently and effectively.

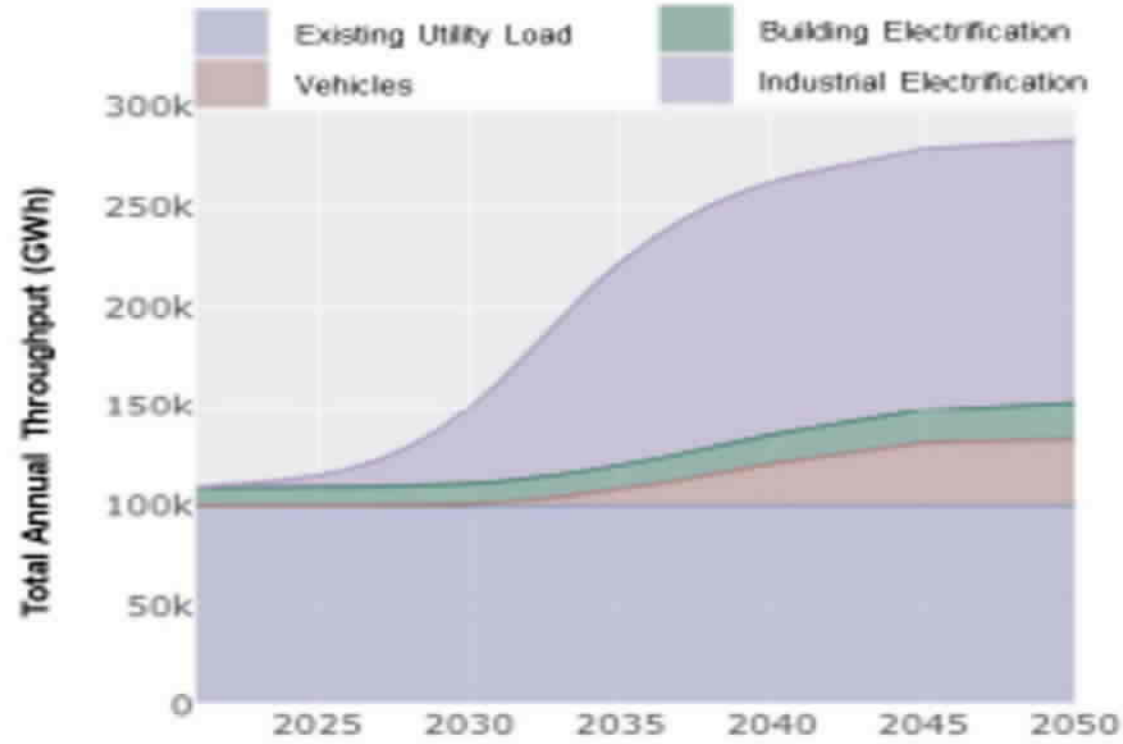
Electric Demand Within CEHE's System Could Nearly Triple By 2050

Based on a recent study, electric demand in CEHE's system is expected to triple by 2050…

Overview

- The Greater Houston Partnership (GHP) recently commissioned a study of the potential fuel mixes that could power Houston and significant increase in electric demand over the coming decades
- The study analyzed a range of electricity and hydrogen-powered scenarios, and in all cases found that total Houston electric demand could nearly triple by 2050
- Increased industrial electrification demand is expected to drive the vast majority of growth comprising over ~45% new of load
  - Industrial electrification demand could be as much as total load on CEHE's entire system today
- This historic growth will require a significant investment in the Houston electric system
  - Large scale T&D expansion, upgrades, and replacement
  - New transmission capacity to deliver power from west Houston (generation hub) to east Houston (industrial demand hub)

Expected Increase in Total Load[1]



… and significant investment in the electric distribution and transmission system is required to maintain reliable service

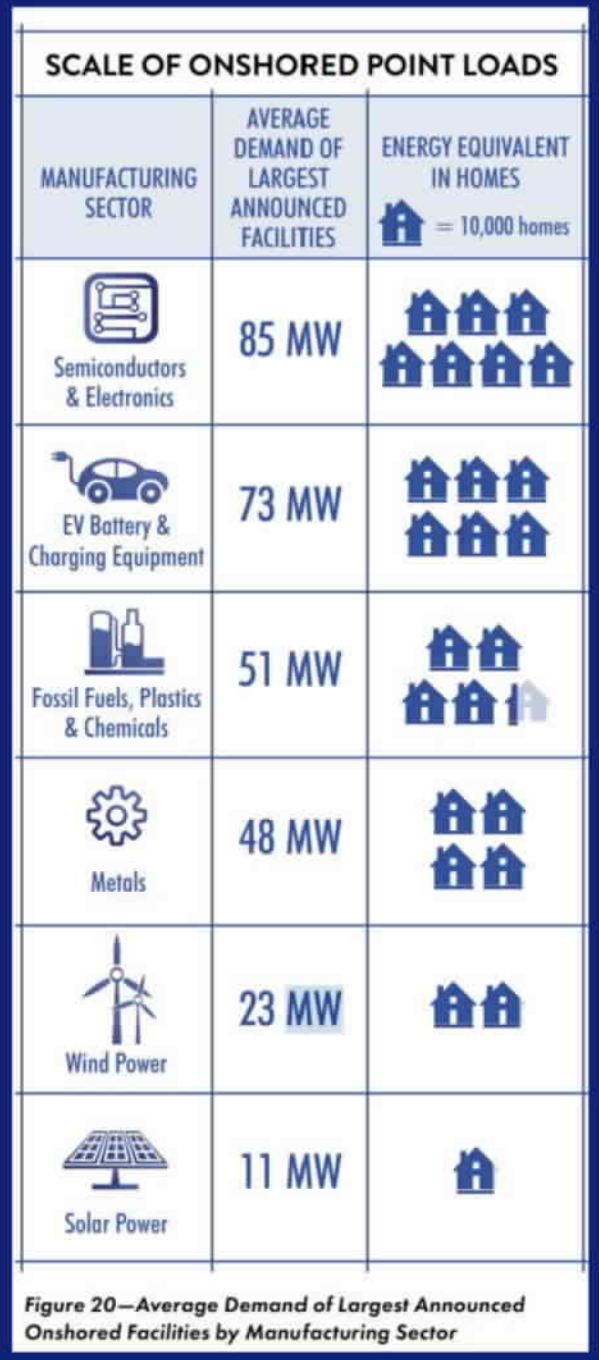


Figure 20—Average Demand of Largest Announced Onshored Facilities by Manufacturing Sector

Historically, load growth is associated with demographic and socio-economic factors that result in incremental increases (or declines) across regions. Physical climate change is an emerging driver with potential for both gradual and abrupt effects on regional load. The effects of reindustrialization and decarbonization are beginning to be felt.

Point loads can have step-change impacts, as highlighted by Figure 20, which shows the scale of the demand associated with some of the largest onshored manufacturing facilities announced as of March 1, 2023. The pace of announcements, the size of manufacturing and other point loads, and the possibility of accelerated development timelines as well as specialized power supply, power quality, and service reliability requirements together create the potential for disruptive impacts on grid planning and investment.

EPRI is initiating an assessment of load forecasting methods and timelines, update schedules, and current and possible future data inputs, and EPRI's Climate Resilience and Adaptation Initiative (Climate READi) involves comprehensive analysis of the effects of physical climate change on the electric sector.[29]

This study of onshoring and reindustrialization has highlighted the need for higher-resolution modeling and analysis to account for the scale, timing, and uncertainty of point loads in regional forecasting and integrated resource planning. Increased coordination among electricity providers, manufacturers, system operators, development agencies, regulators, and other stakeholders is essential to ensure that significant new demand and other requirements can be met in efficient and timely fashion.

Table 1—EV and Battery Space: Three Largest Facilities (as of March 2023)

Company	Location	Date of Operation
Nissan	Canton, Mississippi	2025
ADS-TEC Energy	Auburn, Alabama	2024
BlueOval SK	Glendale, Kentucky	2025
Average Demand: 73 MW		

Table 2—Semiconductors and Electronics: Three Largest Facilities (as of March 2023)

Company	Location	Date of Operation
Taiwan Semiconductor Manufacturing Co., Phase 1	Phoenix, Arizona	2026
JX Nippon Mining & Metals USA	Mesa, Arizona	2024
Micron Technologies	Clay, New York	2024-2030
Average Demand: 85 MW (Arizona facilities only)		

Table 4—LNG, Chemicals, and Plastics: Three Largest Facilities (as of March 2023)

Company	Location	Date of Operation
Blue Ammonia	Beaumont, Texas	2025
Shell Chemical	Beaver City, Pennsylvania	2025
Total Energies	Hackberry, Louisiana	2027
Average Demand: 51 MW		

Source: EPRI Report, see prior slide

Advantages of Dispatchable Demand Flexibility over Central Generation

DERS are Capable of Being Here in a Hurry
(They're Already Here)

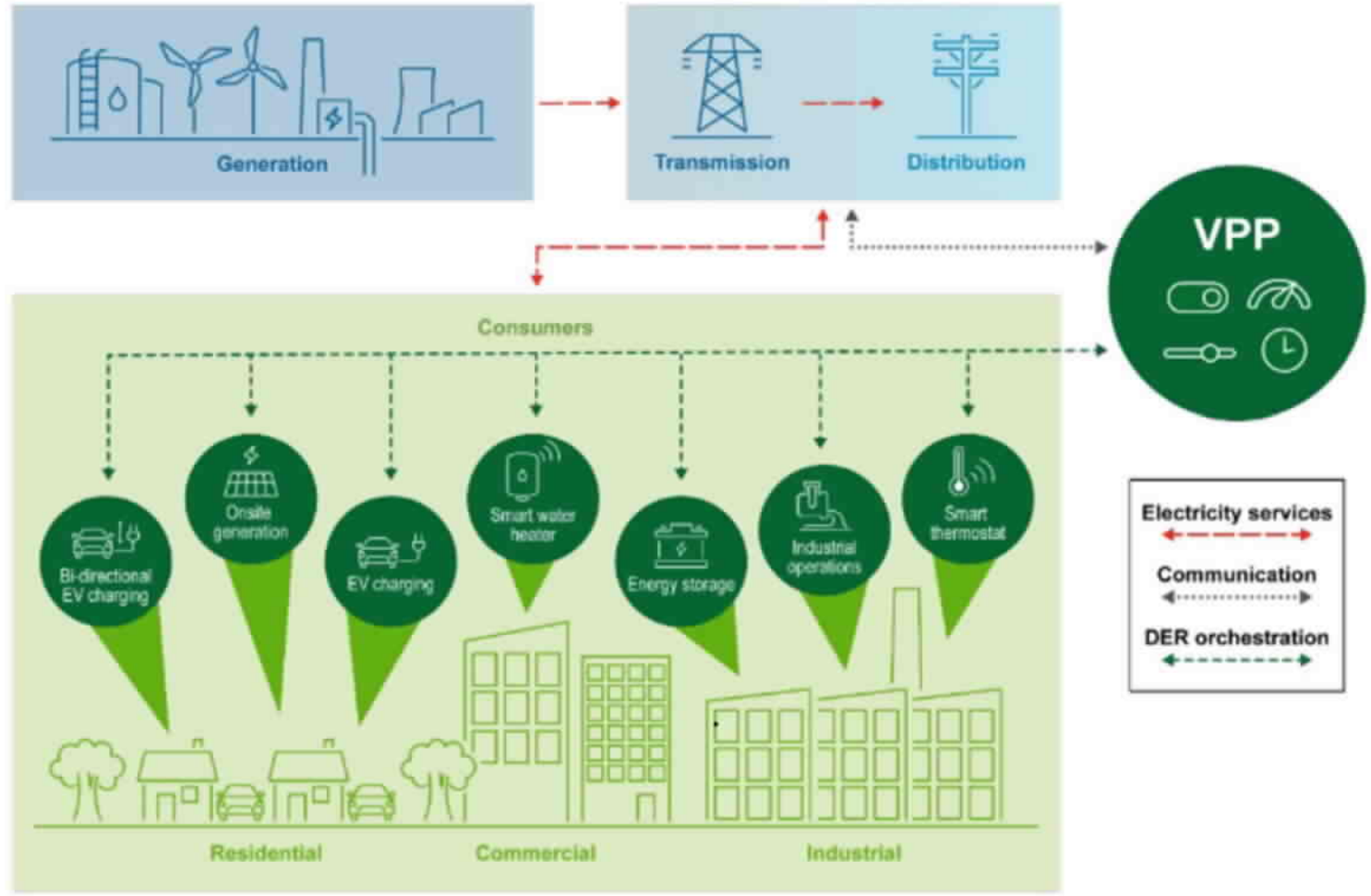
Simpler, faster interconnection

More value when generation is closer to load

Bought for customer, shareable with grid at low additional cost to grid & more benefit to customer if paid for fairly by utility/grid

High redundancy levels make single points of failure extremely rare

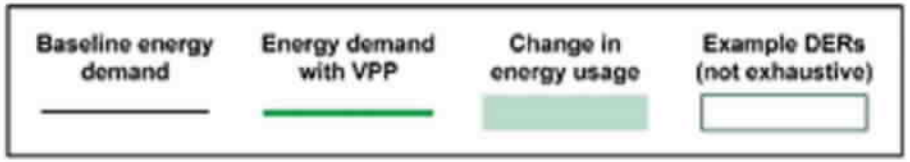
Virtual power plant

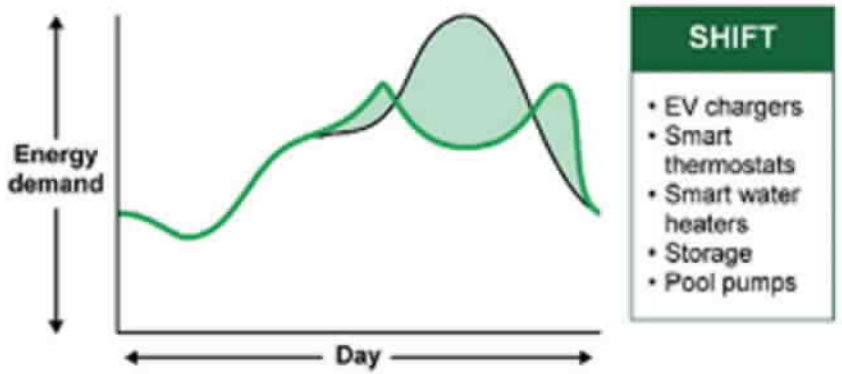


Source: DOE Liftoff Report, Virtual Power Plants (2023)

Ways in which DERs can shape demand on the grid

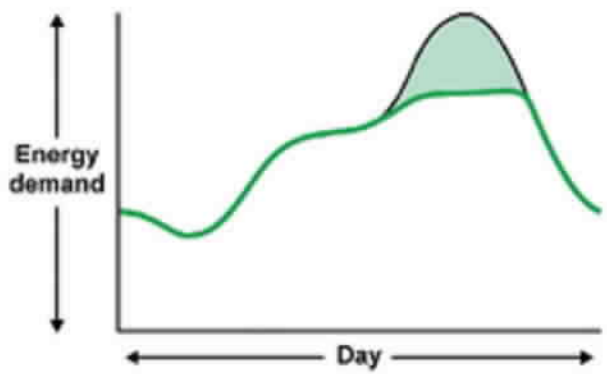
Source: DOE Liftoff Report, Virtual Power Plants (2023)





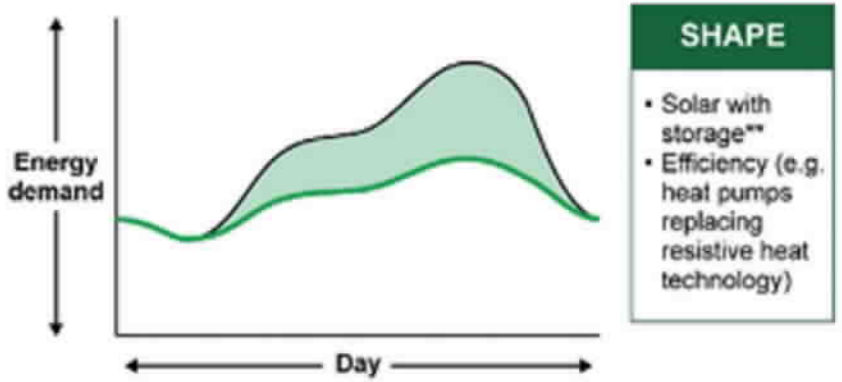
SHIFT

- EV chargers
- Smart thermostats
- Smart water heaters
- Storage
- Pool pumps



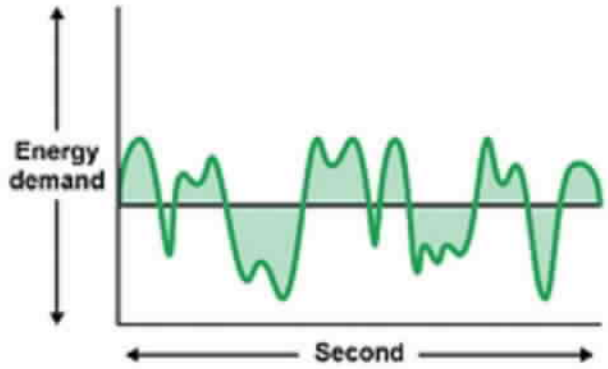
SHED*

- C&I loads
- Lighting



SHAPE

- Solar with storage**
- Efficiency (e.g. heat pumps replacing resistive heat technology)



SHIMMY

- Storage (batteries)
- Water heaters

Note: *Load shed for some DERs results in load shifting to later hours as a system (e.g., HVAC) recovers from an event.
**Distributed solar with storage reduces demand on the grid without impacting the energy consumed behind the meter.
Source: Adapted from Lawrence Berkeley National Laboratory and NASEO-NARUC Grid-Interactive Buildings Working Group.[xii]

Distributed Energy Products

We design and deploy distributed energy resources to meet your grid service needs.

Dynamic Capacity

Reduce demands on distribution and transmission infrastructure.

Flexible Ramping

Support local and system ramping needs cost effectively.

Frequency Regulation

Participate in four-second frequency regulation markets.

Voltage and Reactive Power Support

Provide voltage and reactive power support at local and bulk power levels.

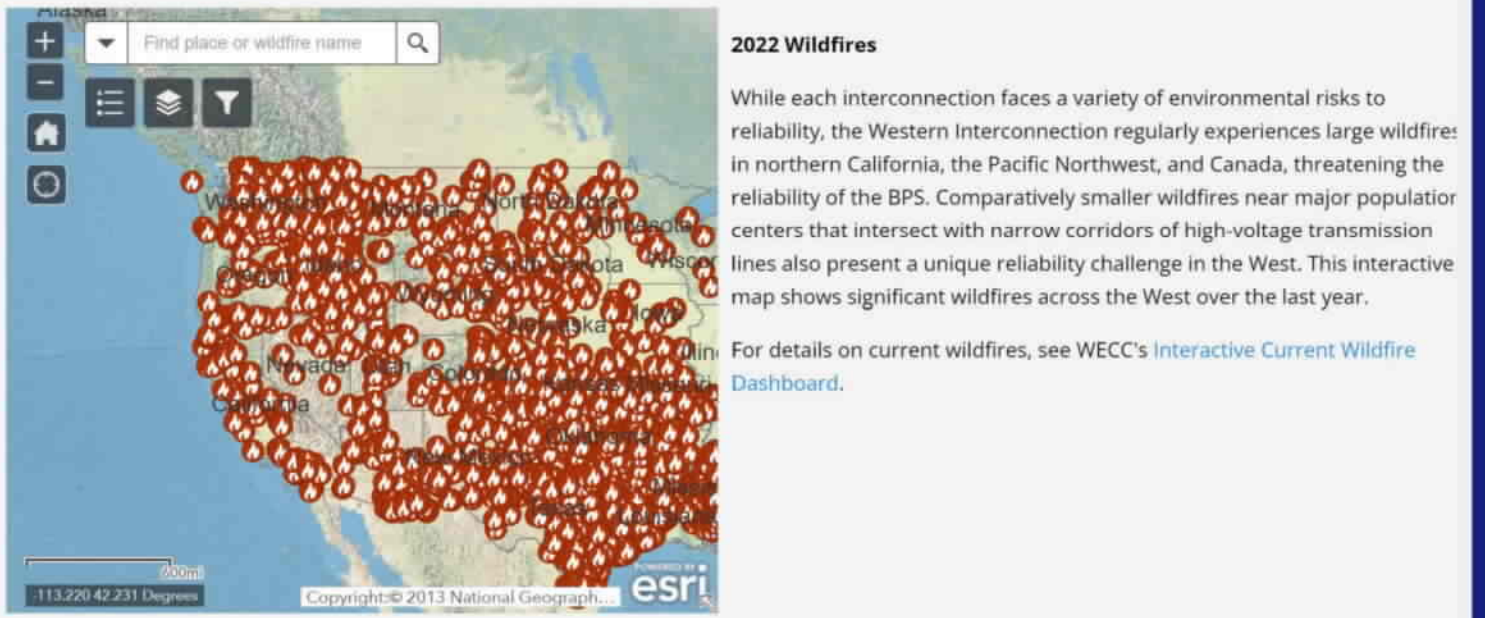
Emergency Backup

Enhance system resiliency with aggregated customer battery installations.

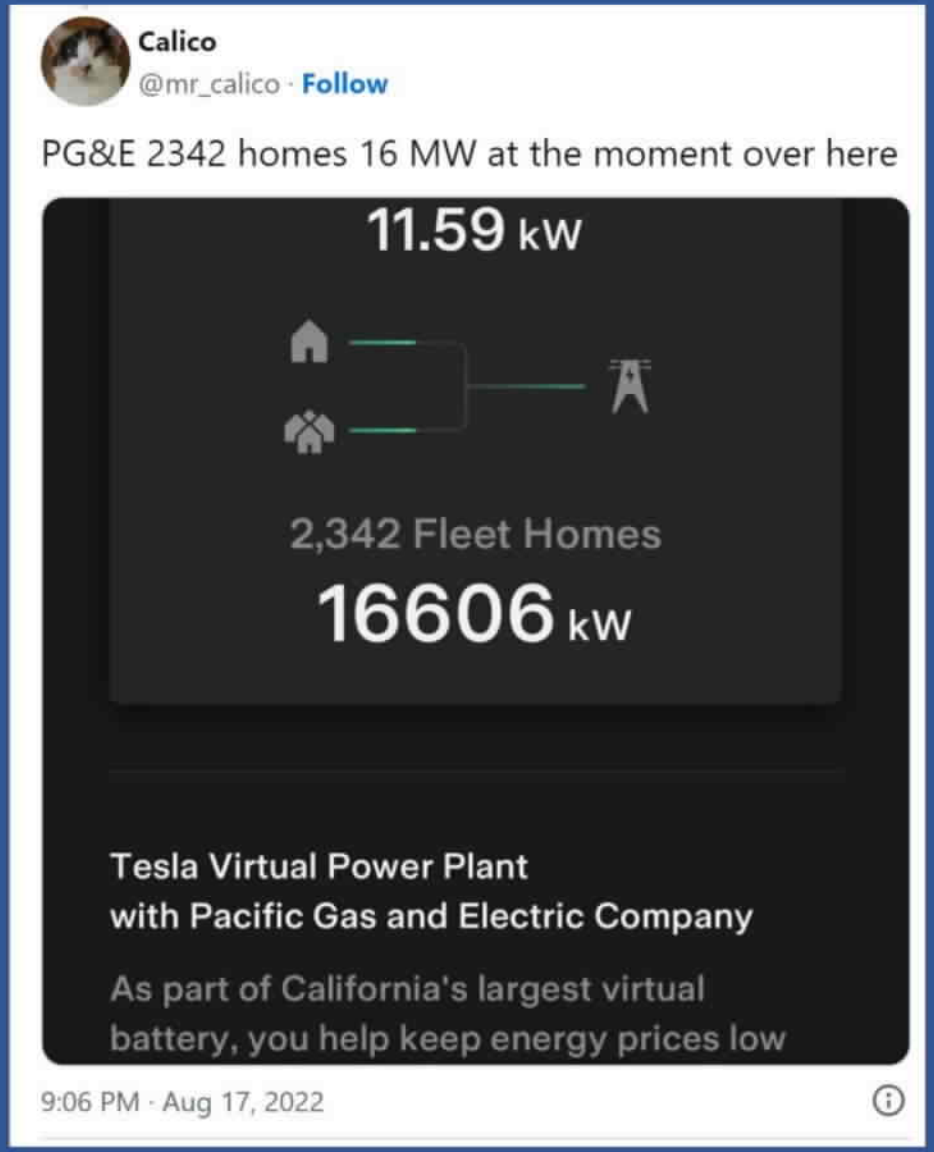
Situational Intelligence

Gain second-by-second visibility of the grid edge.

Virtual Power Plants Launched Within a Year in CA



https://www.wecc.org/epubs/StateOfTheInterconnection/Pages/Western-Interconnection.aspx



Virtual Power Plant

Contribution Potential by 2030

- Can contribute to resource adequacy at a low cost
  - ✓Reduce greenhouse gas emissions
  - ✓Reduce T&D congestion and support aging last-mile infrastructure
  - ✓Empower communities (direct reliability investment dollars to consumers)
  - ✓Adaptable to meet evolving grid needs
- Distributed systems provide redundancy against grid failures including national security attacks, cyber attacks, weather, supply chain disruptions
  - **Redundancies protecting performance of the whole system are not easily compromised by loss of some or several devices or elements of the distributed grid**
- Deploying **80-160 GW of demand flexibility products** including grid-integrated Virtual Power Plants **by 2030 to help address national capacity needs could save on the order of $10B in annual grid costs** and will direct grid spending back to electricity consumers.

(Source: VPP Liftoff Report, 2023, Department of Energy)

A History of Portfolio Success Across Sectors

Over $40 billion in innovative clean energy & advanced transportation loans and commitments

Advanced Nuclear | $12 Billion
First AP1000 reactor in the U.S. **(Vogtle)**

Advanced Vehicles & Components | $19.6 Billion
Accelerated domestic electric vehicles manufacturing.
(BlueOval SK, Ford, Nissan, Tesla, Ultium Cells)

Concentrating Solar Power | $5.8 Billion
Five CSP plants utilizing diverse technologies.

Utility-Scale PV Solar | $4.7 Billion
First five photovoltaic (PV) solar projects larger than 100 MW in the U.S.

Critical Materials | $3.2 Billion
Supporting domestic supply chains for electric vehicles battery manufacturing in the U.S. **(Li-Cycle, Redwood Materials, Rhyolite Ridge, Syrah Vidalia)**

Virtual Power Plants | $3.0 Billion
Landmark commitment to scale up access to DERs nationwide. **(Hestia)**

Wind Energy | $1.7 Billion
Four onshore farms, including one of the world's largest. **(Shepherds Flat)**

Advanced Fossil | $1 Billion
Conditional commitment for industrial decarbonization & clean hydrogen project. **(Monolith)**

Geothermal | $546 Million
Innovative thermal extraction, revitalizing the sector.

Hydrogen | $504 Million
Innovative clean hydrogen storage facility.
(Advanced Clean Energy Storage)

Transmission | $343 Million
Advanced transmission lines for improved grid reliability. **(One Nevada Line)**

NOTE: Loan Amounts on this page represent the approximate amount of the approved loan at closing (or, for active conditional commitments, at time of conditional commitment announcement), including principal and any capitalized interest. Note that in making an obligation of use of loan authority, DOE does not include capitalized interest in those amounts.

Energy Policy Innovation does not just require technical proficiency, resources, and political buy-in – it requires an individual mindset of hyperfocus on human welfare and progress.

Double down on first principles for energy policy (or any policy):

Approach to Innovation is Yes, And… not Yes, But…

Creative minds are unfiltered and unencumbered by myopia and pre-judgment

Solve real problems or be bored to death!

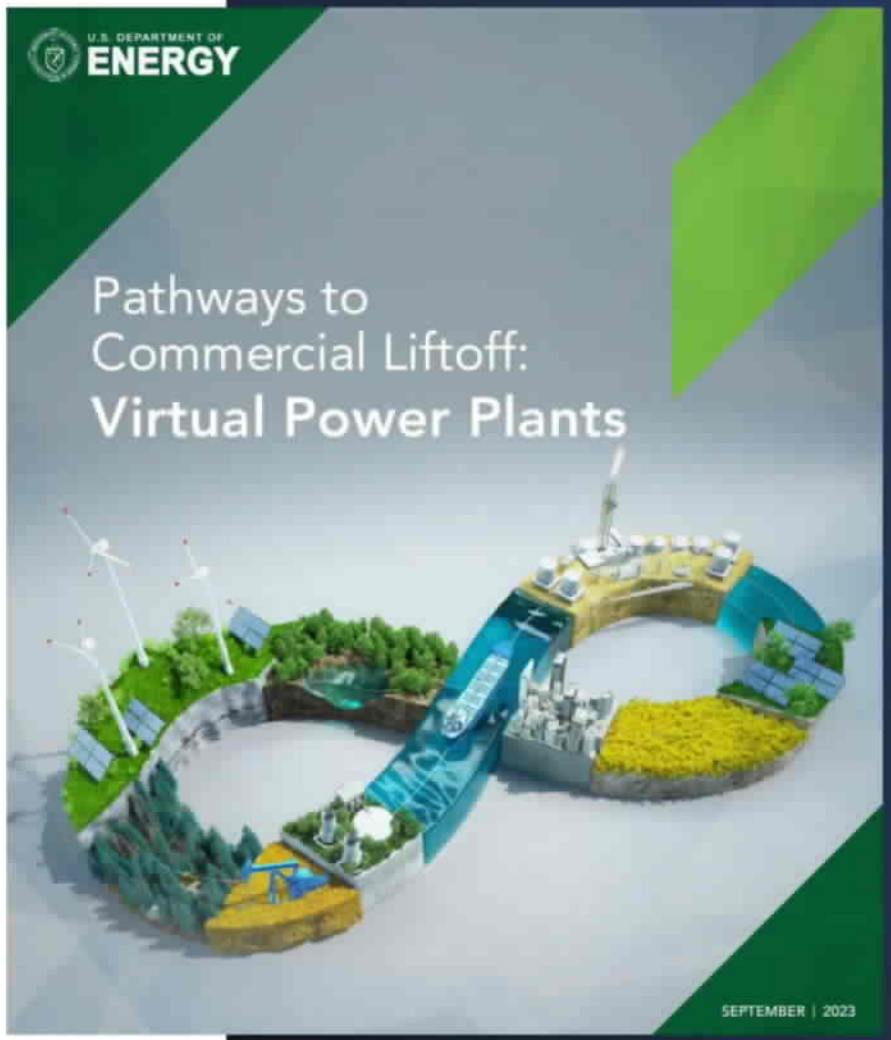
Use analogy, history, global outlook, research, and phone-a-friend somewhere else in the world

Everyone is a customer of multiple entities and companies – and every customer is someone's family – does your action and viewpoint marginalize or help your family's future, or someone else's'?

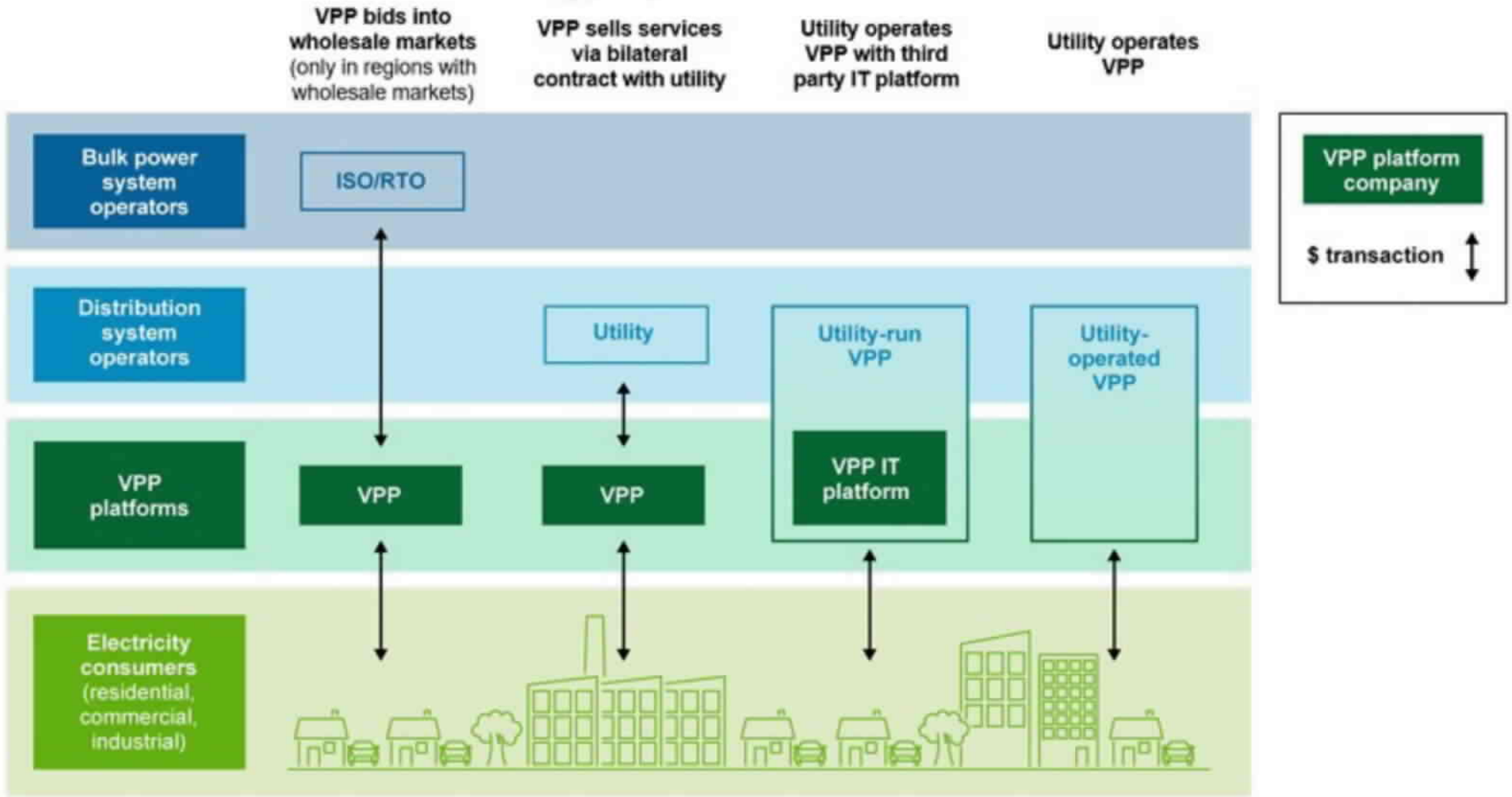
Need diversity of minds, ages/generations, and talents working together to solve hard problems

Demand-Side Resilience and Flexibility Products

- Overview of Models
- Examples



VPP market participation models



(Source: VPP Liftoff Report, 2023, Department of Energy)

RTO/Market-integrated VPPs will unlock the most grid reliability value

Integration is the most sophisticated level of service from a Virtual Power Plant

3) RTO/Market Integration (Available in ERCOT Pilot Today; Objective of FERC Order 2222)

- Market Integrated VPPs (like ADERs) communicate their behavior and intentions to the ISO/RTO (market operator) in response to an ISO/RTO instruction
- This unlocks additional services and value (awards for availability in capacity and reserve products; dispatchable in real-time via ISO/RTO economic generation dispatch)
- Makes the VPP more useful and reliable in grid operations – allows DERs to participate directly in wholesale price formation

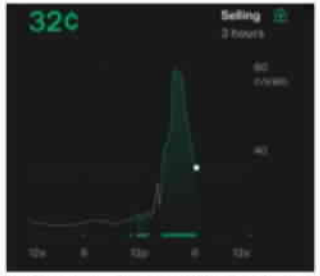
Screenshots: Tesla Electric (Tesla Energy Ventures, LLC) is a retail energy provider and load serving entity in Texas which aggregates customers into VPPs that provide ancillary services and real-time energy sellback from reserves stored in customer Tesla Powerwall systems.

Participation in the Tesla Electric VPP will earn you $10 per Powerwall, per month, as a credit on your monthly electric bill. You will still earn your monthly Sellback Credits for any energy sent back to the grid.

Tesla Electric: VPP participation in ancillary service included in customer bill credits

2) Response to Scarcity Signals from the Grid Operator

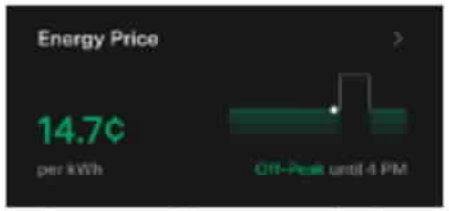
- Aggregated DERs provide additional support by exporting more during grid needs
- Motivates the DERs to provide additional capacity when most valuable to wholesale market
- Examples include peak energy prices or 4CP (demand response)



Tesla Electric: Consumer devices sell energy to grid on-peak

1) Permanent Load Shift From Static information In Rates

- The most basic grid support from DERs comes from responding to time varying rates
- This modifies the premise consumption profile every day to reduce impact during peak times



Tesla Electric: Consumer devices programmed to charge off-peak

(Source: Tesla ADER 1 Year Recap Status Presentation, Public Utility Commission of Texas Project No. 53911, https://interchange.puc.texas.gov/search/documents/?controlNumber=53911&itemNumber=55

ADER Pilot Journey

To create, register, and qualify a new type of resource, ERCOT, Utilities, Tesla, and others had to create new pathways.

New Coordination and Enrollment Processes

- New Processes Established for Coordination with TDSPs, Enrollment Screening, Interconnection Review
- Updating ERCOT's registration portal (RIOO) and completing new ERCOT and PUC Documentation

Technical Challenges related to Telemetry and Dispatch

- Communicating with individual devices and creating pathways for aggregating and delivering the information
- Creating dynamic information about availability of the resource to accomodate customer's use
- Developing measurement and verification with the ERCOT ISO
- Refining dispatch control systems to perform with traditional resource accuracy (or better)
- Building toward a standard for 3rd party participation

Development of retail customer offers and experiences

- Customer engagement, marketing and value proposition. Including enabling customer control
- Creating and implementing customer incentives and compensation

(Source: Tesla ADER 1 Year Recap Status Presentation, Public Utility Commission of Texas Project No. 53911, https://interchange.puc.texas.gov/search/documents/?controlNumber=53911&itemNumber=55

Future needs: higher caps, min efficient scale, multiple, secure revenue streams

The first phase of the ADER pilot allows Tesla to demonstrably assess the viability of aggregations as a provider of energy and reserves. Tesla will execute the first phase with confidence in the capabilities of the devices and our control systems; however, we have raised many questions concerning the economic viability of ADERs in the future and the need to quickly address these issues to allow more market participants to add ADERs to the project. First, we have learned that the costs associated with maintaining a QSE and servicing telemetry is challenged on a small scale. The ADER pilot created an opportunity for distributed devices to participate in a manner of equal or better standards applied to traditional resources, which is excellent. Telemetry systems and other QSE costs are often dwarfed by the revenue potential of large, centralized resources. Comparatively, we experience that ADERs have a break-even point near the 15-20MW scale. This scale is at or above current QSE caps, which must be increased.

ADERs are capable of providing ECRS and RRS, and subsequent Pilot Phases must include opportunities to demonstrate this capability to ensure the long-term revenue streams exist for ADERs during the pilot, including for third party participants Tesla endeavors to support, and, material access to revenue streams available in future market design when the pilot sunsets.

Source: Tesla ADER 1 Year Recap Status Presentation, Public Utility Commission of Texas Project No. 53911, https://interchange.puc.texas.gov/search/documents/?controlNumber=53911&itemNumber=55

Tesla Virtual Power Plant With SDG&E

- Compensation for exports beyond site meter at $2/kwh
- CPUC Tariff for NEM Rule 21 Customers: Emergency Load Reduction Program
- Seasonal events (summer season ends October 31)
- Payments sent to customer from Tesla on behalf of SDG&E after end of peak season
- Participation opt-out by event
- Participation in exports over the customer-set backup reserve
- Participation trigger – CAISO Flex Alert Events
- Participation through Tesla App
- SDGE determines eligibility
- "Powerwall will export a safe amount of power, which may be similar to onsite solar export. This may not be the full power capacity of your Powerwall."

https://www.tesla.com/support/energy/virtual-power-plant/sdge

Tesla Electric Virtual Power Plant Beta with ERCOT

- Compensation for exports at ERCOT prices
- Compensation for non-spin hours sold day-ahead
  - Reflected in Energy Sellback Credits to LSE Customers
- Year-round events
- Payments sent to customer from Tesla as energy bill credits (and once a year cash-out option if Tesla's retail plan)
- Participation opt-out by event
- Participation in exports over the customer-set backup reserve
- Participation trigger – ERCOT Real- Time and Forecasted Conditions Reflected in A/S Market
- Participation through Tesla App
- Oncor determines eligibility
- "Powerwall will export a safe amount of power, which may be similar to onsite solar export. This may not be the full power capacity of your Powerwall."

https://www.tesla.com/support/energy/virtual-power-plant/sdge

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Vermont PUC lifts caps on Green Mountain Power battery storage programs with Tesla, others

Demand for GMP's Tesla-based and "bring your own device" energy storage programs has outstripped annual caps amid winter storms and summer floods.

Published Aug. 29, 2023

GREEN MOUNTAIN POWER

- Green Mountain Power is an LSE/Vertically Integrated Utility that is a ISO-New England Market Participant
- Green Mountain Power allows customers to bring their own device, or utility leases batteries to customers
- Tesla providers dispatch capabilities to GMP Needs
- GMP saves on peak power costs and the VPP participates in Regulation Service, offsetting A/S costs for all load

https://www.tesla.com/support/energy/virtual-power-plant/sdge

Tesla Energy
@teslaenergy

4800 Powerwalls saved Vermont residents $3M in peak costs & kept the lights on during the worst storms last winter

canarymedia.com
Vermont's biggest utility dramatically expands home battery subsidies
Since 2015, Vermont's Green Mountain Power has helped a limited number of customers install home batteries each year. Now the program cap is gone.

12:06 PM · Sep 7, 2023 · **97.5K** Views

Literature Review

Coming Soon at @ArushiSF and Linkedin.com/in/ArushiSharmaFrank

Texas to activate its first virtual power plants

A pilot project tests how consumer-owned small energy devices like batteries, generators, electric vehicle chargers and more can be virtually aggregated and participate in the wholesale electricity market.

AUGUST 24, 2023 RYAN KENNEDY

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U.S. Department of Energy (DOE)
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When Winter Storm Uri hit Texas two years ago, more than 2 in 3 people lost power. Last week, Secretary Jennifer Granholm met with Austin Mayor Kirk Watson and Texas' ADER Pilot Task Force to discuss scaling up Virtual Power Plants—an alternative to increase grid flexibility & reduce fossil fuel use.

Learn more about VPPs: https://lnkd.in/gcqNhVSa