Better Buildings®
U.S. DEPARTMENT OF ENERGY

Better Buildings Residential Network
Peer Exchange Call Series

Residential Storage – An Essential Piece of the Climate Puzzle

November 9, 2023

U.S. DEPARTMENT OF ENERGY

Agenda and Ground Rules

- Moderator
  - **Jonathan Cohen,** Better Buildings Residential Network, U.S. DOE Residential Buildings Integration Program (RBI)
- Agenda Review and Ground Rules
- Residential Network Overview and Upcoming Call Schedule
- Opening Poll
- Featured Speakers
  - **Jason Finkelstein,** McKinsey & Company
  - **Imre Gyuk,** U.S. Department of Energy (DOE)
  - **Benjamin Shrager,** U.S. Department of Energy (DOE)
  - **Meredith Roberts,** Generac Power Systems, Inc.
- Open Discussion
- Closing Poll and Announcements

Ground Rules:

1. **Sales of services and commercial messages are not appropriate** during Peer Exchange Calls.
2. Calls are a safe place for discussion; **please do not attribute information to individuals** on the call.

The views expressed by speakers are their own, and do not reflect those of the Dept. of Energy.

Join the Network

Member Benefits:

- Recognition in media, social media and publications
- Speaking opportunities
- Updates on latest trends
- Voluntary member initiatives
- One-on-One brainstorming conversations

Commitment:

- Members only need to provide *one number*: their organization's number of residential energy upgrades per year, or equivalent.

Upcoming Calls (2nd & 4th Thursdays):

- *12/14: The Potential of Whole-Home Lighting Systems and Low-Voltage Homes*
- *1/11: TBA*

Peer Exchange Call summaries are posted on the Better Buildings website a few weeks after the call

Jason Finkelstein

McKinsey & Company

U.S. DEPARTMENT OF ENERGY

McKinsey & Company

Residential Energy Storage

"Residential Storage – An Essential Piece of the Climate Puzzle"

November 9th, 2023

Jason Finkelstein
Partner, San Francisco

Jason is a Partner in the San Francisco Office of McKinsey & Company

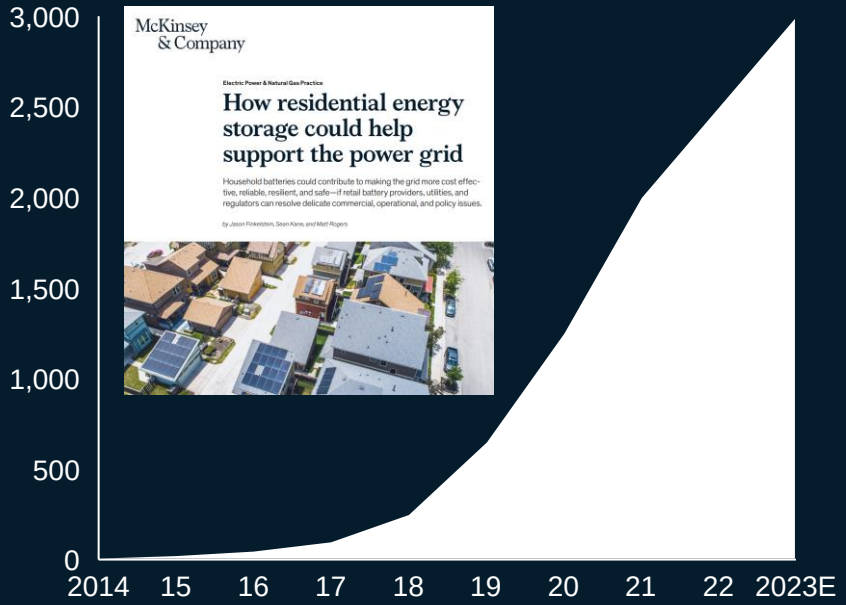
Jason the **global leader of our distributed generation service line**

He has supported clients all over the world in topics related to distributed generation across a variety of strategic, growth, and operational topics

We projected significant growth in residential storage in 2018 and the market has grown in line with expectations

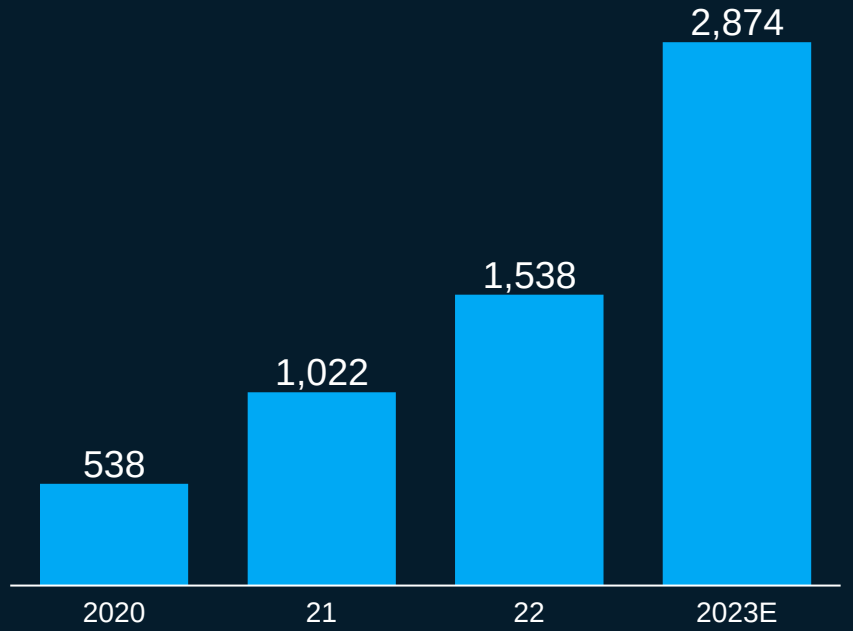
What we predicted in 2018[2]:

Projected annual US residential energy-storage installations, Megawatt-hours



What has actually happened:

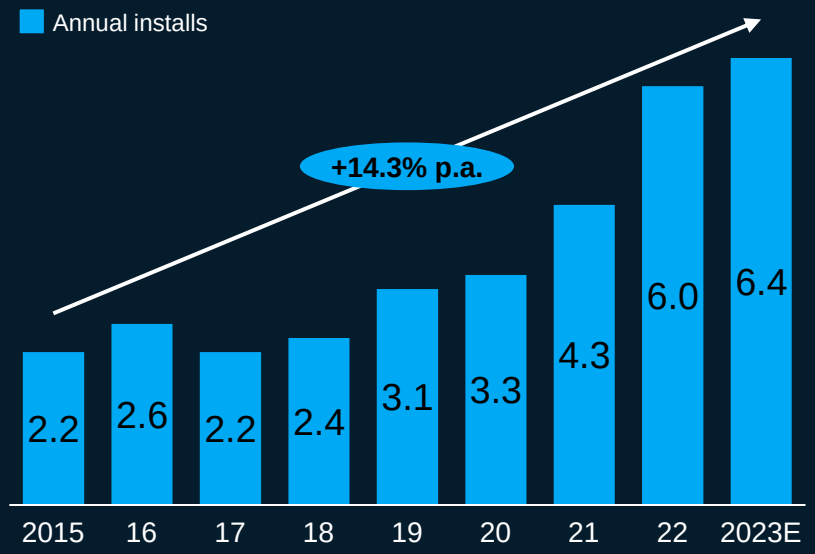
Actual US residential energy-storage installations[1], Megawatt-hours



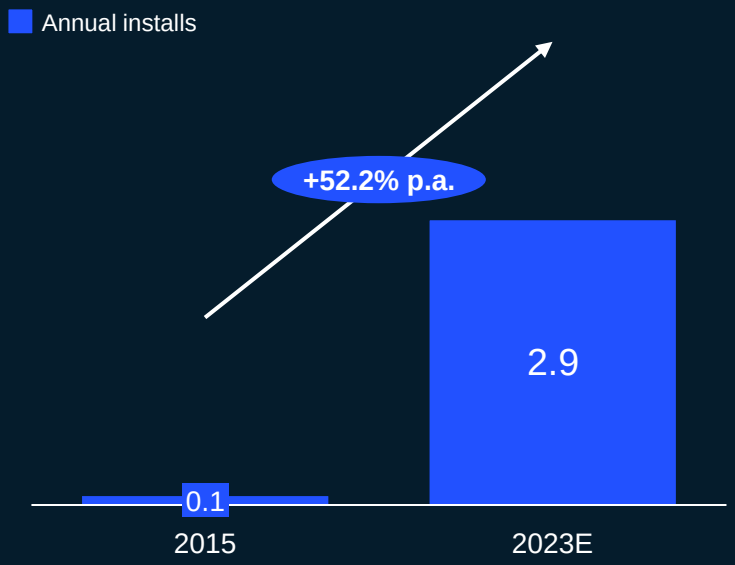
1. Wood Mackenzie, US Energy Storage Monitor Q3, 2023
2. "How residential energy storage could help support the power grid," McKinsey & Company.

While the underlying resi solar market has grown meaningfully, it has been outpaced by the resi battery storage market

Market size, residential installs,
GWp



Annual US residential energy-storage installs[1],
Gigawatt-hours



Vast majority of residential battery storage systems are sold in conjunction with solar

Source: McKinsey Solar Model, Solar DG and BTM BESS model, Q1 2023

The US residential storage market is driven by four key factors

Solar industry | Storage industry

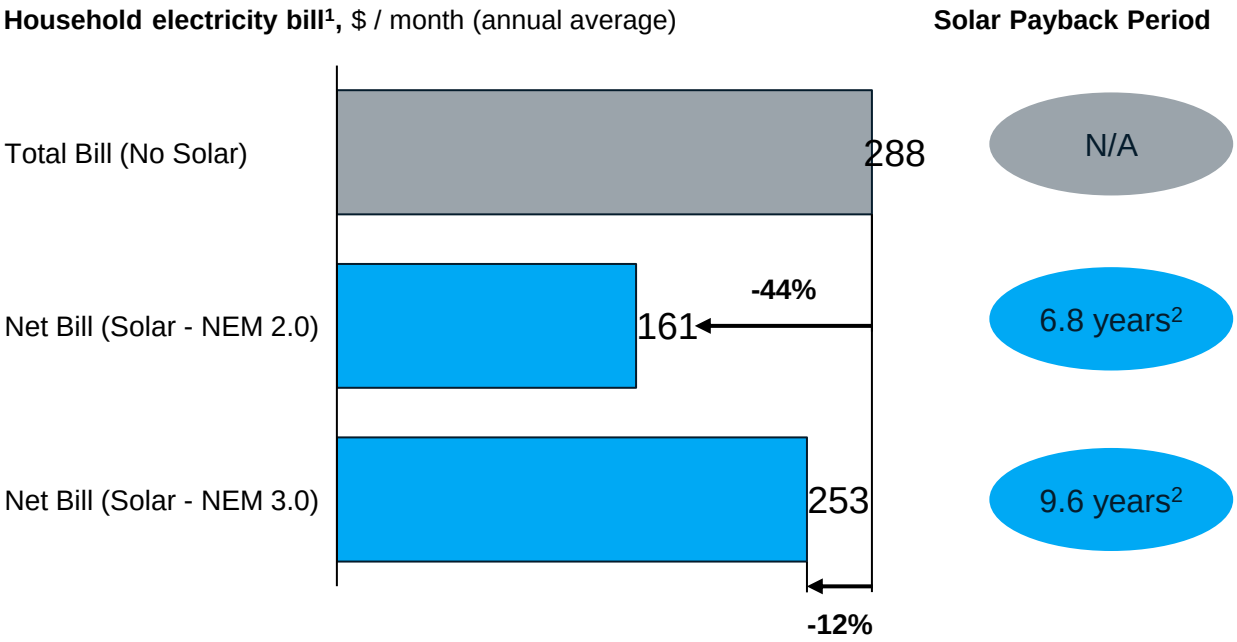
Deep dive to follow

Key drivers	Impact	Sector impacted	Rationale
System cost decline & LCOE reductions			Solar costs have historically decreased 4% p.a. from 2015 to 2020; decline is expected moving forward, albeit at a lower rate Storage costs have fallen 7% p.a. from 2015 to 2020, and are expected to continue to decline as the manufacturing scales and installation techniques improve CapEx declines have positive implications on solar and storage adoption, as systems become more economic
Investment tax credit (ITC)			The Inflation Reduction Act extended the Investment Tax Credit through 2033 – was set to expire in 2024
High & rising electricity costs			Traditionally, high electric prices in markets like California and Hawaii have enhanced savings for homeowners in these states, which drove early adoption of systems Historically, electricity rates have risen at 1-2% per year (albeit with wide variance across markets), slowly improving the value proposition of solar
Net metering reform			The change of net metering policies in some states has made stand alone solar less attractive as programs offer lower rates for the excess generation the systems produce This reform typically benefits self-consumption, significantly improving he business case for storage

Source: McKinsey solar model; PV magazine; The Biden Plan to Build a Modern, Sustainable Infrastructure and an Equitable Energy Future; Expert interviews

Net metering reform has changed the solar value proposition

Simplified Northern California example



1. $0.38 / kwh summer electricity price and $0.29 / kwh winter price (PG&E average of 2021/2022 for through-cycle view); 0.7% annual retail rate escalation; bill for solar customers includes $191 / month in solar system payments
2. $4.50 upfront cost per installed W, 7kW PV with no battery, 30 kWh/day household consumption

Source: Team analysis; EIA California residential rates; Wood Mackenzie

NEM 3.0

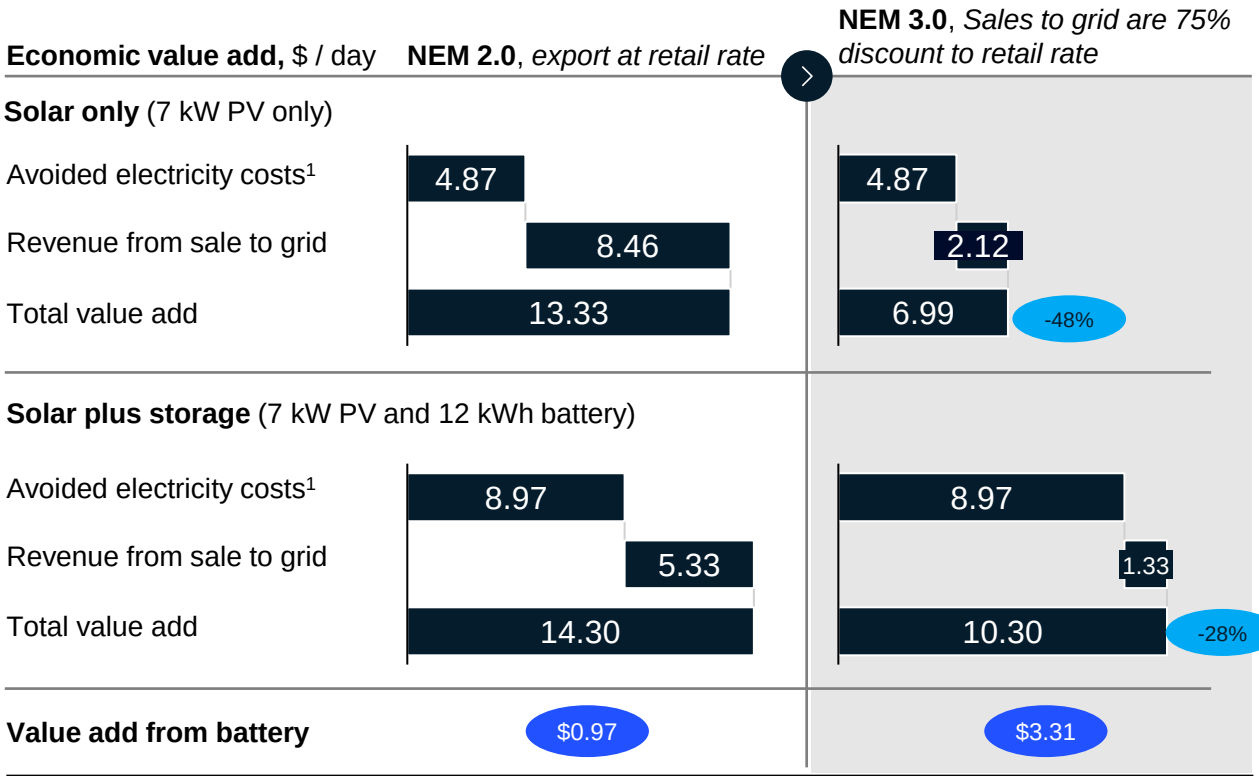
Under NEM 2.0, solar owners received full retail credit for power exported to the grid – **under NEM 3.0, the credit is reduced by ~75%**

The decrease in export compensation leads to **higher monthly electricity bills for solar owners and a longer payback period**

Modelled changes in economics based on NEM 3.0

Simplified California example

XX Economic decline vs. NEM 2.0 | Detailed next



Source: McKinsey Distributed Energy Resources (DER) tool; PG&E summer 2021 rate card

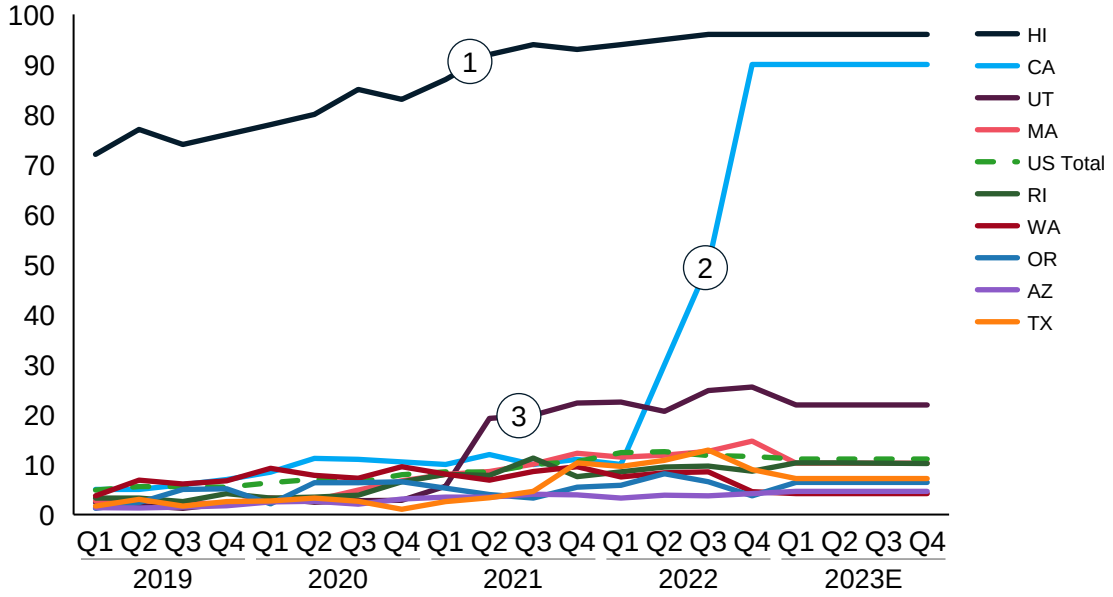
The economics of PV only and PV-plus-battery are **less favorable under NEM 3.0**

However, under NEM 3.0, the **incremental value of BTM storage is expected to grow** by roughly 3x

NEM 2.0 rules allowed owners to use the grid like a battery – using credits from exports to import later in the day – but this is no longer possible when export compensation is far below retail

The attach rates of batteries have seen significant upticks in certain markets

Projected annual US residential energy-storage installations[1], Megawatt-hours



Changes in policy have had significant impacts on storage markets

1. Wood Mackenzie, US Energy Storage Monitor Q3, 2023

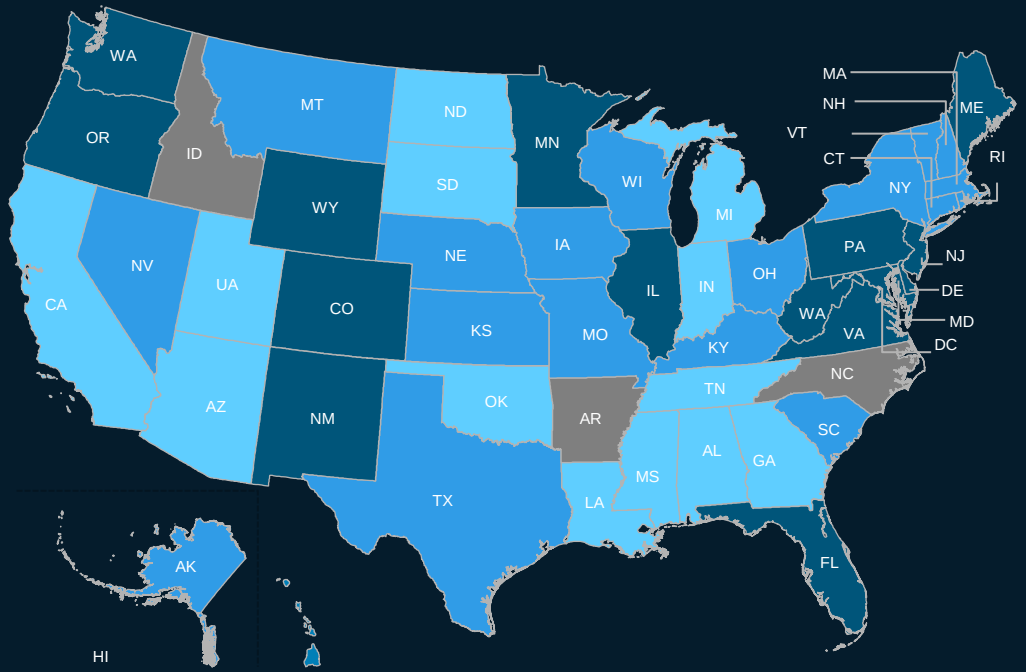
1. Hawaii has achieved high attachment rates after implementing net metering reform

2. California attachment rates have drastically increased in response **to NEM 3.0 policy** changes

3. Utah attachment rates have increased resulting from new **virtual power plant (VPP) incentives** and the decline of net metering where the state **cut export rates by over 36%[1]**

This story could play out in other markets as residential solar penetration levels rise

State Net Metering Policies, June 2023



True metering

Full 1:1 retail rate compensation for power exported to the grid

No net metering

Compensation for exports below retail rates (e.g. net billing systems)

Modified net metering

No state-wide rules, net metering policies vary by power provider (e.g., Texas)
Near net-metering but includes some additional charges for solar owners (e.g., New York)

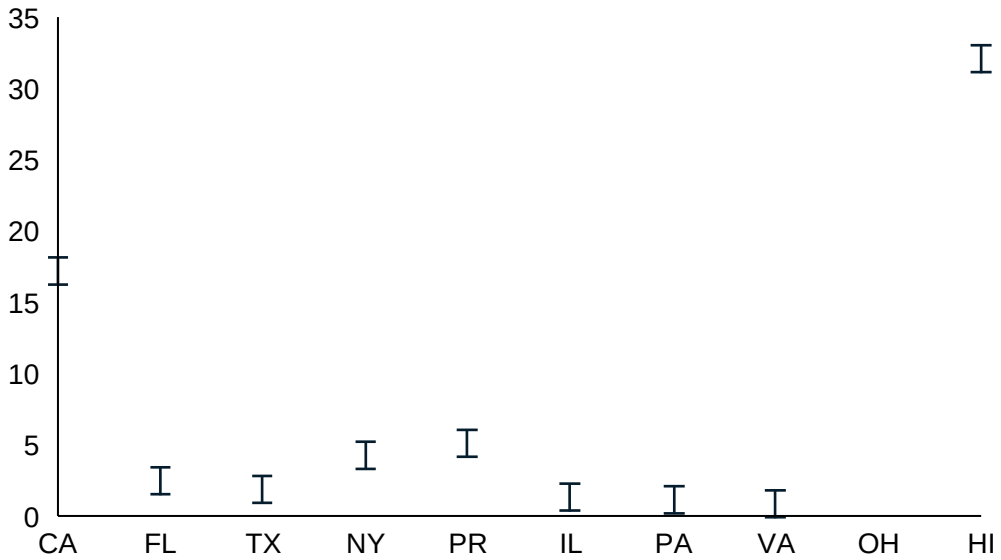
Net metering set to end soon

Announced decisions to phase out net metering within the next year (e.g., North Carolina, Arkansas, Idaho)

Source: Solar Reviews

CA and HI were well out ahead of the solar trend – as other markets catch-up they could look for batteries to help solve intermittency

Approximate US residential solar penetration rate by state (2022)[1], %



Current US solar **penetration rates are ~4-5%** leaving significant room for growth

High solar penetration can result in significant electricity generation during peak solar hours – creating a mismatch of when the power is needed and when it is generated

As solar penetration rates increase, batteries have been used as a tool to combat the integration of residential solar projects

1. McKinsey Solar DG Model

Key Takeaways

Underlying attractiveness

The residential solar and storage market continues to be bolstered by powerful and generally persistent trends:

- Cost of electricity, in most markets, continues to rise
- Technology and installation costs have seen meaningful declines, with some bumps
- The Inflation Reduction Act and extension of the Investment Tax credit offered real regulatory tailwind

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Energy Resilience

Residential storage plays a key role in resilience

- Many homeowners see enough value in this alone to choose to adopt
- Major weather events have been on the rise – with each passing event more and more customers will decide to turn to battery storage as an option to ensure reliability

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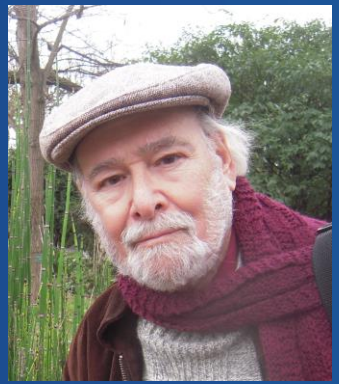
Net Metering Reform

Net metering reform has encouraged self-consumption, leading batteries to take on a critical role in helping customers shift their electricity loads

- Hawaii and California both saw net metering reform drive up attachment rates into the ~90% territory

Questions?



Imre Gyuk

U.S. DOE

Fighting
Climate Change and Poverty
with Residential Energy Storage

IMRE GYUK, CHIEF SCIENTIST
ENERGY STORAGE RESEARCH, DOE-OE

WILDFIRES

DROUGHTS

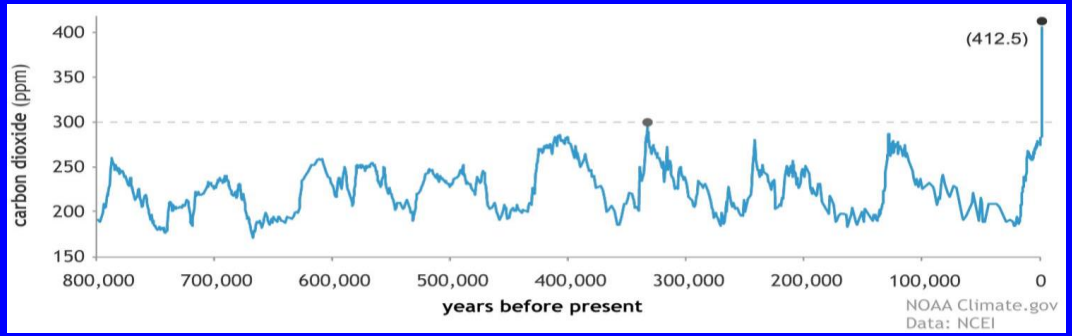
HURRICANES

FLOODS

Floods and Droughts,
but also
Sea Level Rise, Coastal Erosion,
Reduced Crop Yield, Wild Fires,
and Health Impacts

Climate Change due to
Global Warming has Emerged
as a Paramount Issue - World Wide!

Burning Coal. Oil, Natural Gas: for our Electric Grid, Transportation, and Industry



800,000 years Atmospheric Carbon Dioxide

We must Decarbonize,
we must change
to Renewable Energy!

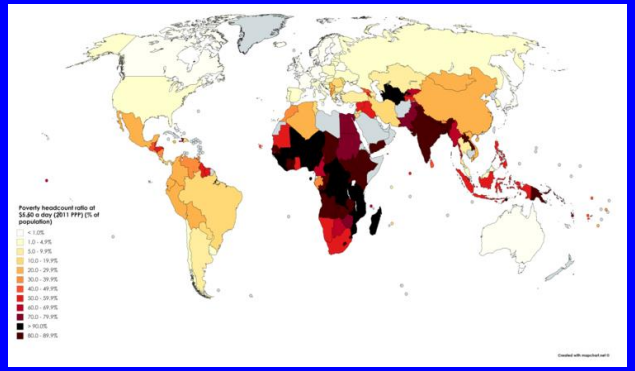
But Renewable Energy
is Variable.
It requires Energy Storage
to make it Dispatchable.
We will need Lots of it!

But Environmental Justice
is not everything.
There is also Social Justice!

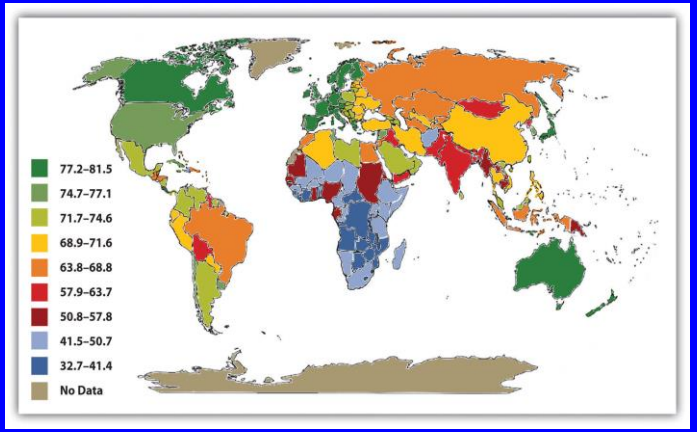
Decarbonization will entail
a vast Reorganization
Of the entire Electricity Industry.

It is important that we not
create or proliferate an “Energy Divide”
which finds less affluent communities
left behind!

World Poverty

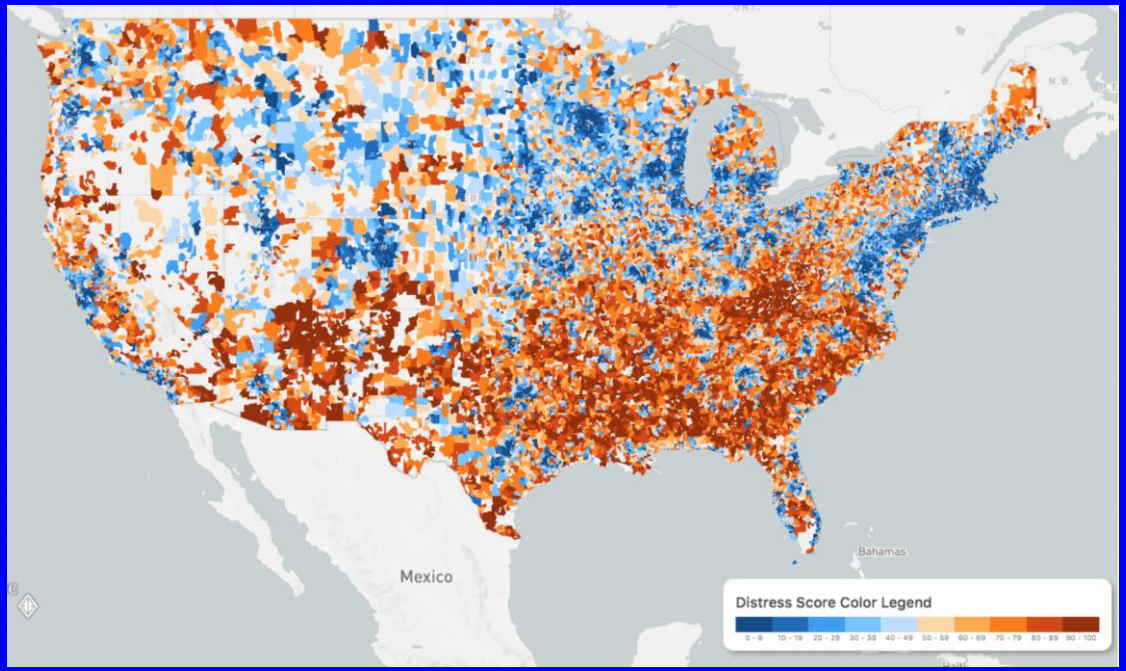


Population % with Earnings ≥ $5.50

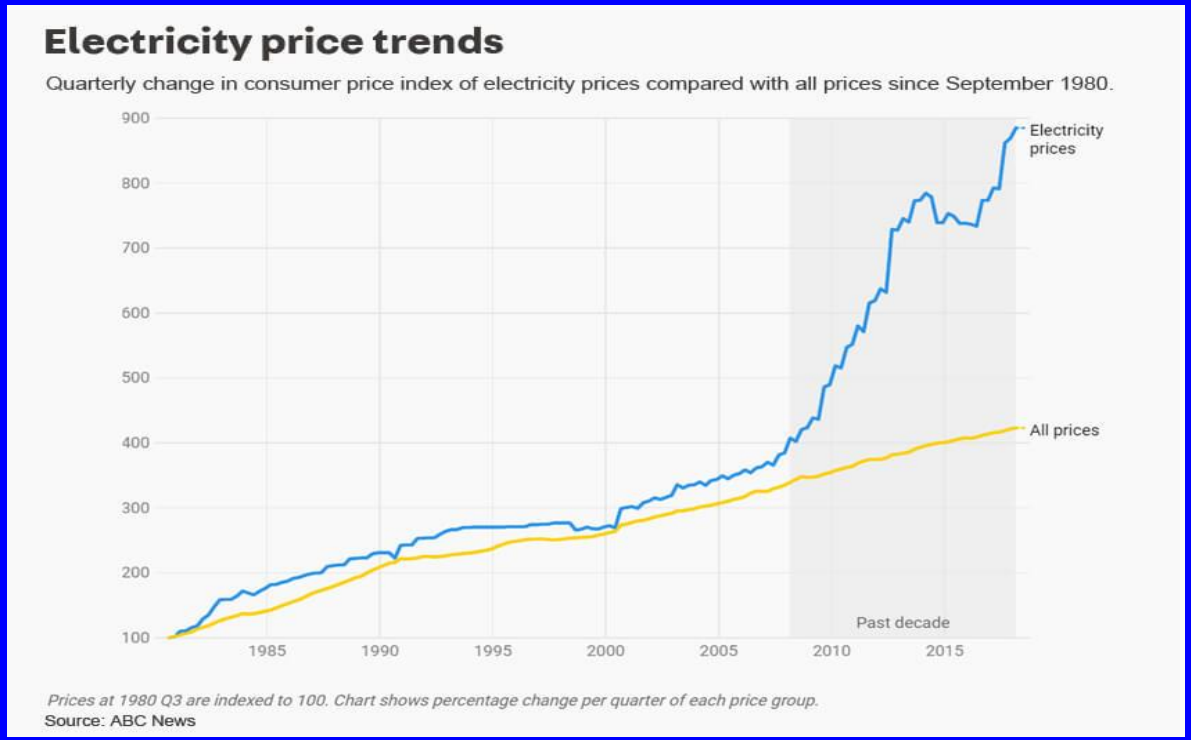


Life Expectancy: 32.7 – 81.5 years

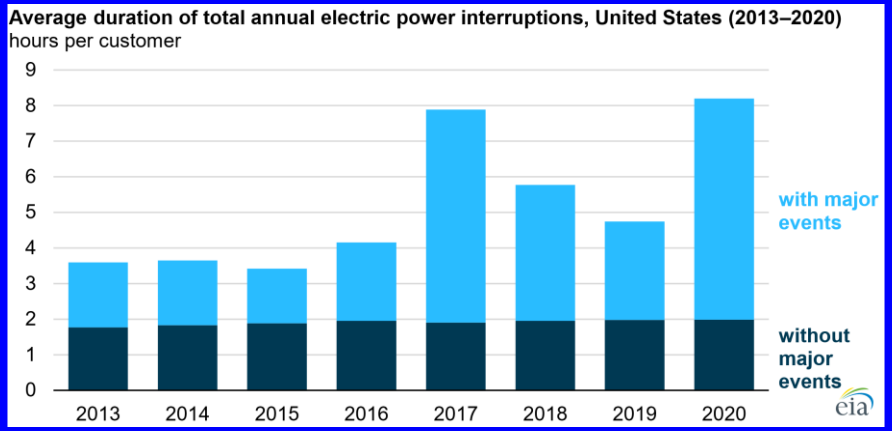
Correlated indices:
Earnings, Literacy, Health, Access to Energy,
Life Expectancy, Resilience to Disasters ….



Distressed Communities can be found throughout the U.S. (VT 1% - MS 40%)

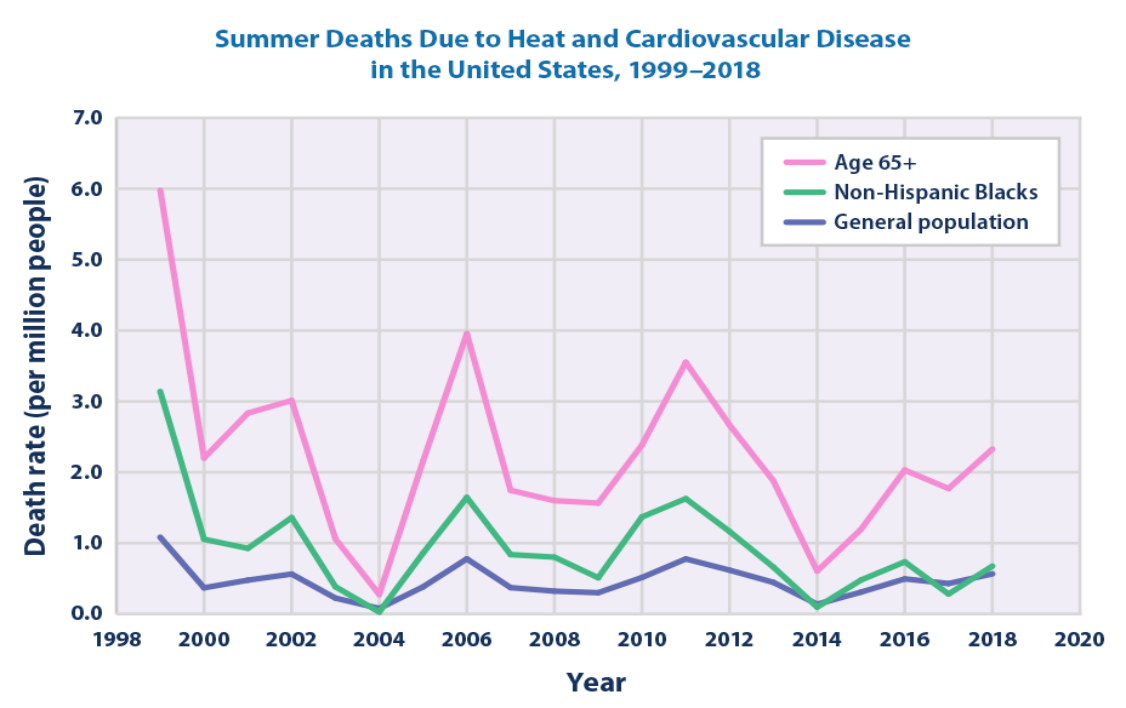


For the past decade electricity prices have been rising substantially

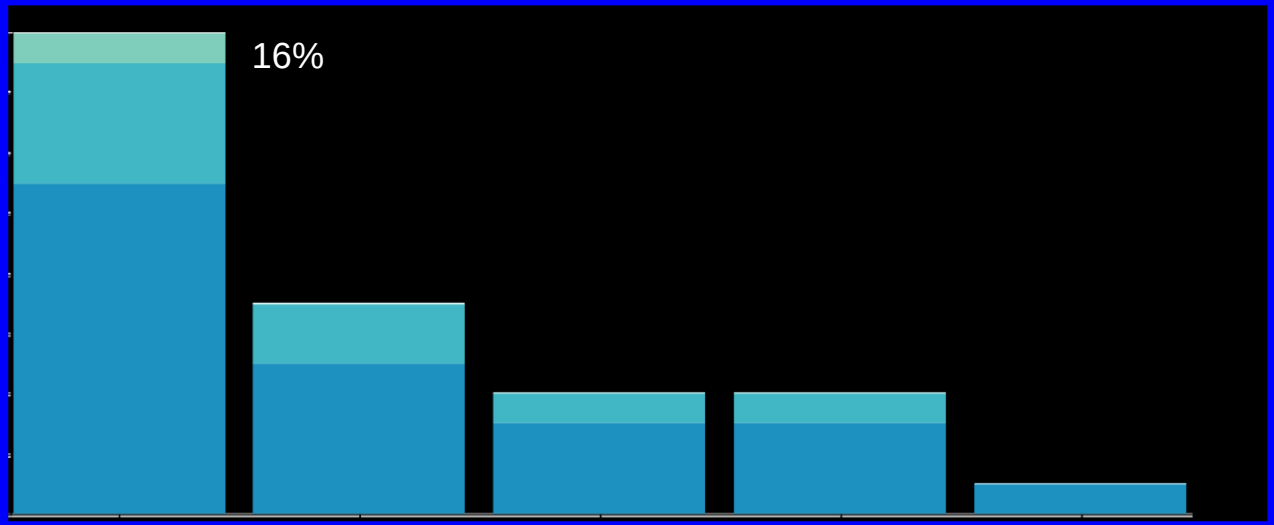


Weather related Grid Outages are becoming more Frequent

… and affect less affluent Communities most!



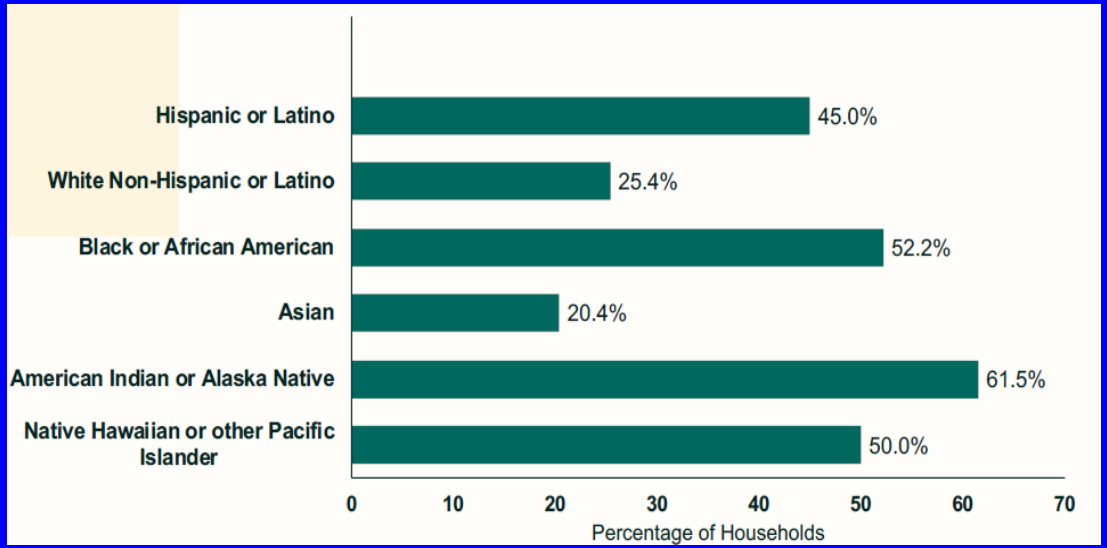
Average Energy Burden (% of Income)



Poorer (AMI) Richer

From S. Baker/Yale

Households Experiencing Energy Insecurity from Electricity Prices and Outages



Lower income households are disproportionally non-white

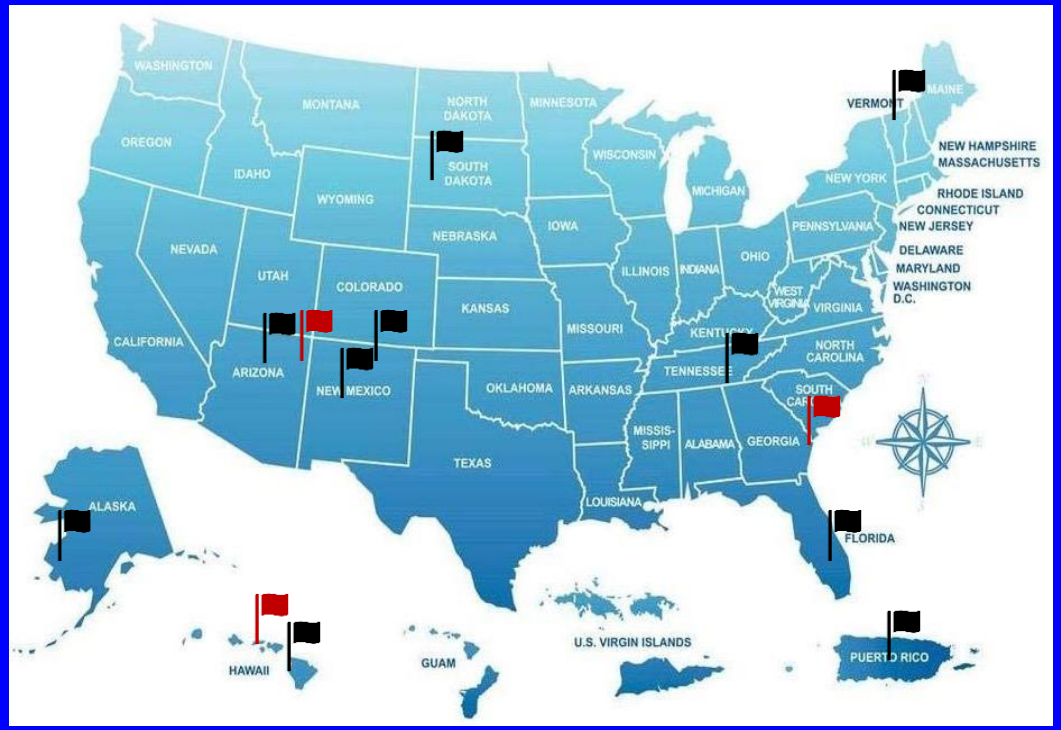
Energy Storage offers itself as a tool to alleviate many of these problems, e.g.

Storage to replace Fossil Fuel Peakers to reduce health effects

Cooling Stations throughout the City

Microgrids with Storage for outage mitigation

Solar + Storage for Remote Tribal communities …..



Current Resiliency Projects

ES4SE Projects in Red

Navajo Nation , AZ

Partnering with DOE-OE, Sandia, NTUA, UEP

Commissioned May 2022

3 kW / 13 day Rechargeable Z Mn O_2 Battery Developed by UEP.

There are 18,000 Residents off-Grid on the Reservation

Atrisco Heritage Academy, Albuquerque, NM

Energy Storage for Social Equity

85% Hispanic,

Reduce peak demand
during occupied hours

Battery: 721 kW/4hr = 2884 kWH
plus **roof-mounted PV = 850 kW**

Villalba, PR

Background:

The Municipality of Villalba is creating a resiliency hub by installing a storage plus solar system at the local theater building.

The resilience hub will be able to serve the local community with additional resources such as a continuity of city services, heating/cooling center, water/food distribution, phone charging, etc.

Villalba is one of five municipalities that formed the Mountain Energy Consortium (CEM) post Hurricane Maria

Previous microgrid analysis was performed for all of the municipalities as part of a larger effort of Sandia supporting CEM

Microgrid Location

DOE Initiative ES4SE:
Energy Storage for Social Equity

14 communities selected
to receive detailed Technical Assistance

***

4 communities were chosen
to partner in constructing
an energy storage facility.

https://www.pnnl.gov/projects/energy-storage-social-equity

Fourteen Communities Tribal, Rural, and Urban

Native Renewable, Flagstaff, AZ
Cher-Ae Heights Indian Community Trinidad, CA
Ayika Solutions Incorporated, Atlanta, GA
Hoʻāhu Energy Cooperative Molokai, Kaunakakai, HI
Together New Orleans, New Orleans, LA
Honor the Earth, Callaway, MN
Coast Electric Power Association, Kiln, MS
Joule Comm. Power & Open Door Mission, Rochester, NY
Warm Springs Community Action Team, Warm Springs, OR
Rogue Climate, Coos Bay, OR
Coyote Steals Fire Energy Group, Pendleton, OR
Makah Tribe, Neah Bay, WA
Klickitat Valley Health, Goldendale, WA
Oneida Nation, Oneida, WI

First Funding Set

- Native Renewables
  - 15 off-grid homes for the Navajo Nation and the Hopi Tribe (Arizona)
  - $415,000 - $525,000

- Ayika Solutions/Harambee House
  - Community shelter in Savannah, Georgia
  - $36,000

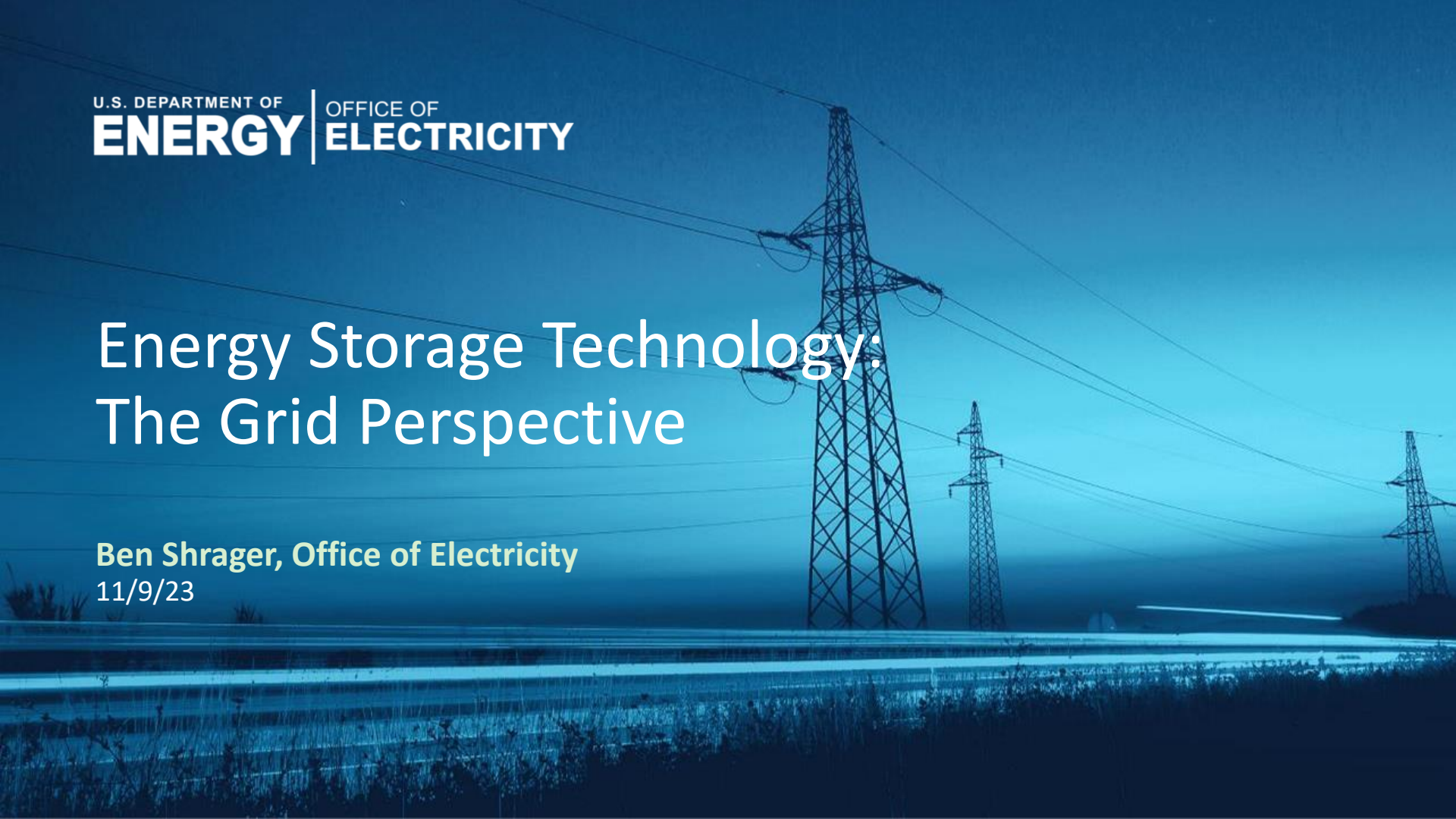
- Ho’ahu Energy Cooperative
  - 15 off-grid homes in Molokai, Hawaii
  - $150,000 - 220,000

- Coast Electric Power Association
  - Resilience for wastewater treatment plant in
  - Hancock County, Mississippi
  - $297,000 - $310,000

We need much more Energy Storage!
And we need it bigger, and safer,
less expensive, and longer in duration.
And we need to apply it in equitable ways.
If we don’t do this, we are in very deep Trouble.

Benjamin Shrager

U.S. DOE



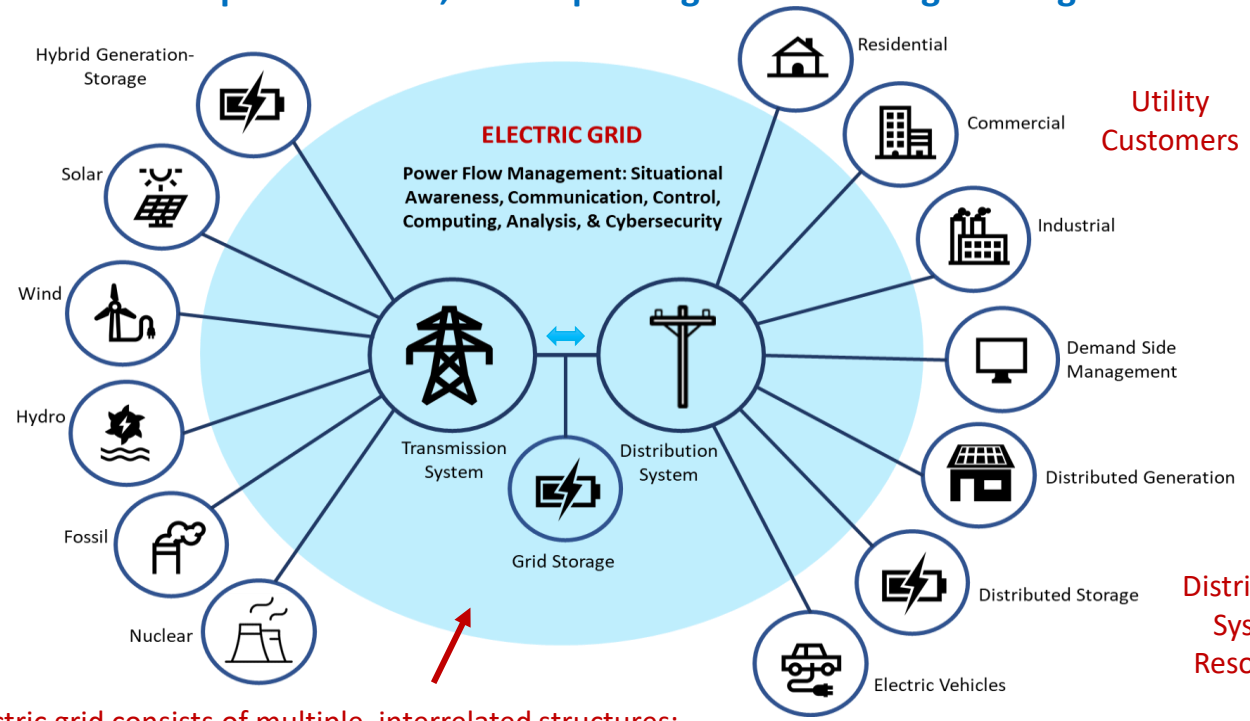
Energy Storage Technology: The Grid Perspective

Ben Shrager, Office of Electricity

11/9/23

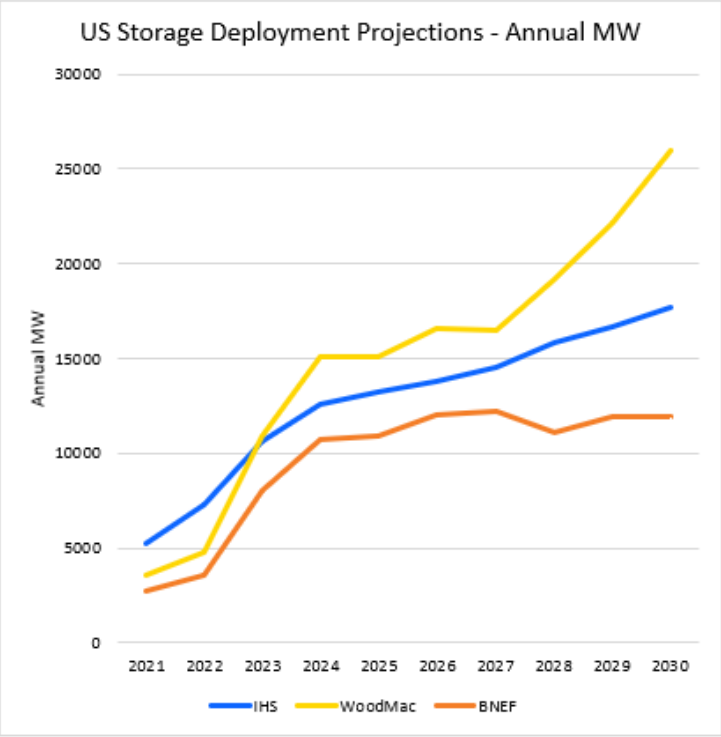
Electricity Delivery System

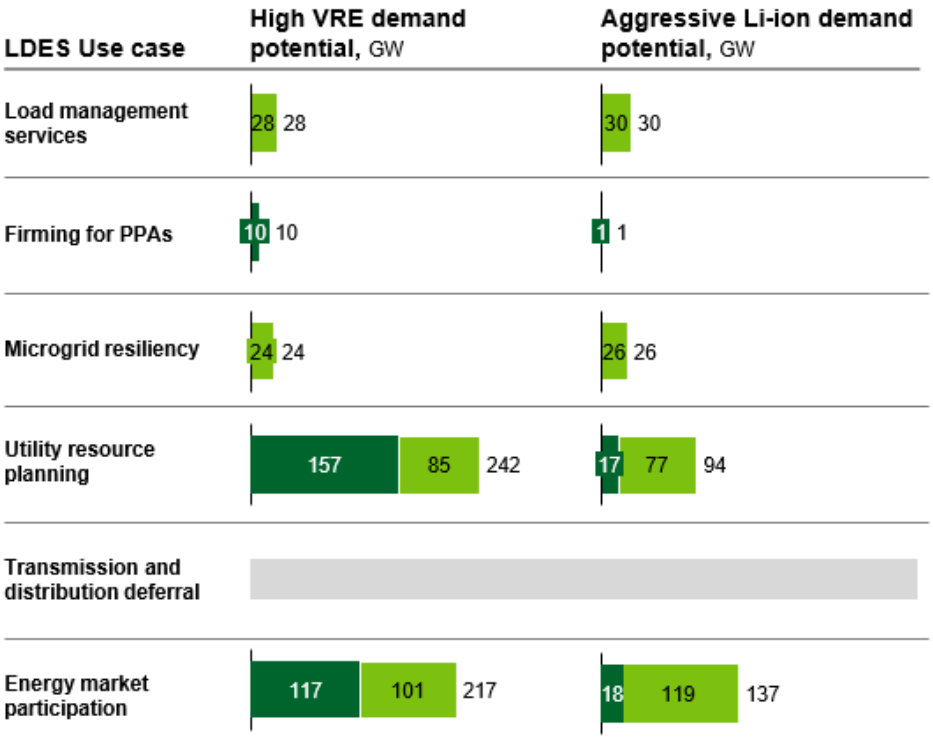
The electric power system is undergoing a dramatic structural transformation. The electric grid, a vast complex machine, will require significant re-engineering.



The electric grid consists of multiple, interrelated structures: the physical, cyber, market, industry, and regulatory structures

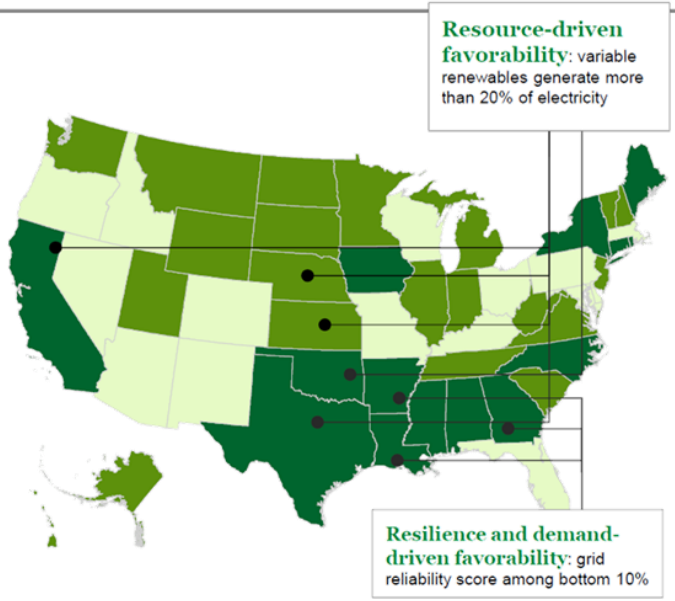
Markets: Emerging LDES Use Cases





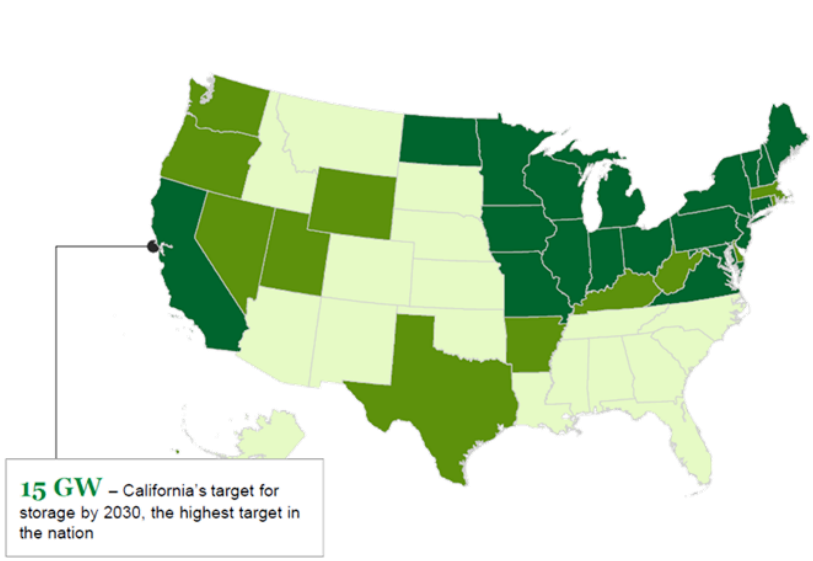
Policy: A Checkered Landscape

Grid conditions



Policy & market construct

Conditions for LDES deployment are:
Favorable Emerging Unfavorable



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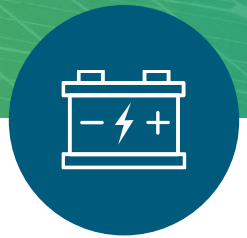
LONG DURATION STORAGE SHOT TARGET

Reduce storage costs by **90%** from a 2020 Li-ion baseline…



…in storage systems that deliver **10+** hours of duration

…in **1** decade

Affordable grid storage for clean power – any time, anywhere

DOE has supported 30+ storage technologies

Bidirectional Electric Storage

- Electrochemical
  - Li-Ion & Li-Metal
  - Na-Ion
  - Na-Metal
  - Lead Acid
  - Zinc
  - Other Metals (Mg, Al)
  - Redox Flow
  - Reversible Fuel Cells
  - Electro-Chemical Capacitors
- Electromechanical
  - Pumped Storage Hydro
  - Compressed Air
  - Liquid Air
  - Flywheels
  - Geomechanical
  - Gravitational

Crosscutting

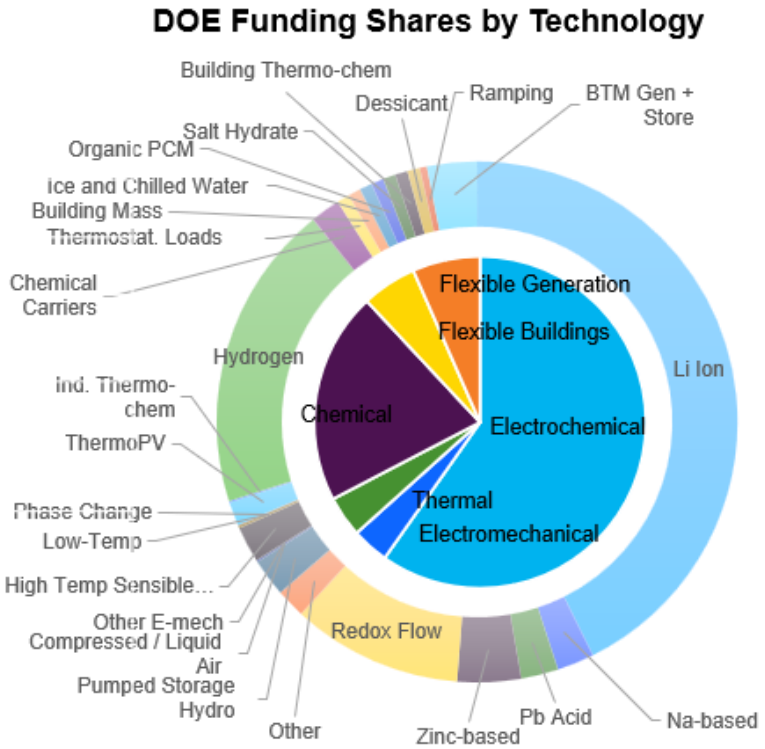
- Power Electronics
  - Power Electronic Systems

Thermal & Chemical

- Thermal
  - High-Temperature Sensible Heat
  - Phase Change
  - Low-Temperature Storage
  - Thermo-Photovoltaic
  - Thermochemical
- Chemical
  - Chemical Carriers (e.g., Ammonia)
  - Hydrogen

Flexible Generation & Loads

- Flexible Buildings
  - Thermostatically Controlled Loads
  - Building Mass
  - Ice & Chilled Water
  - Organic Phase Change Material
  - Salt Hydrate
  - Thermochemical
  - Desiccant
- Flexible Generation
  - Ramping
  - Behind-the-Meter Generation + Storage



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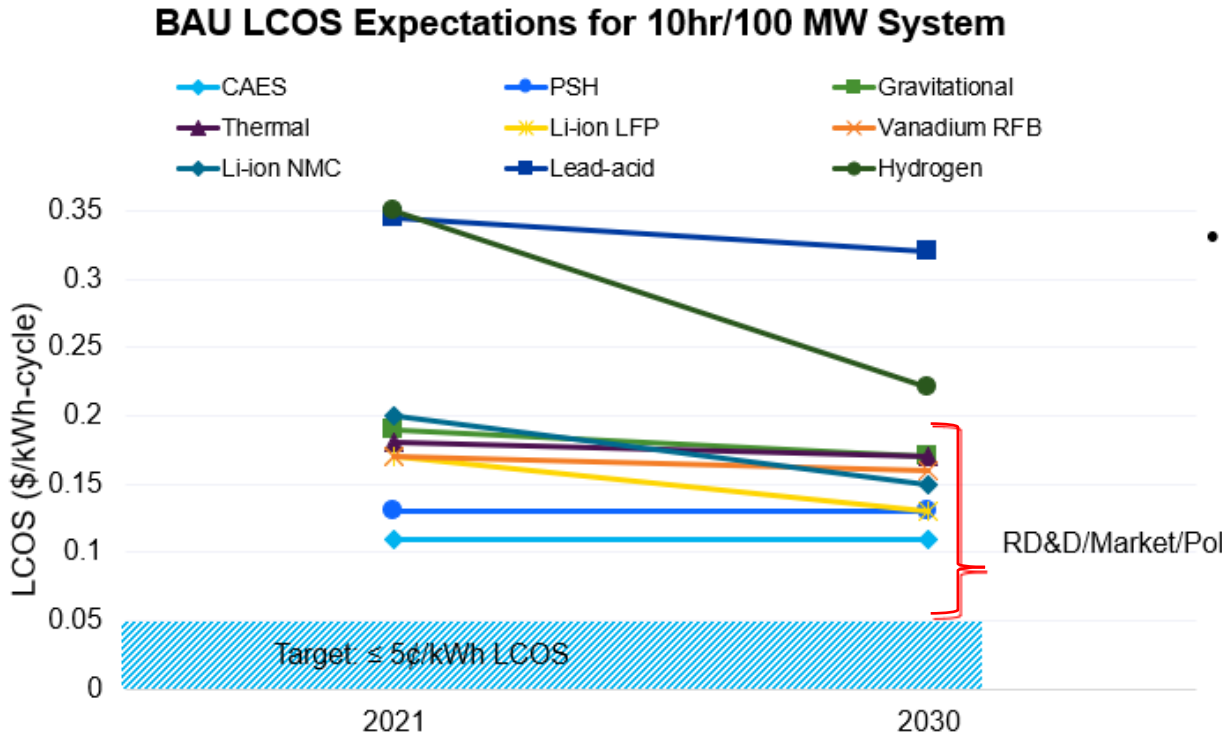
Business-as-usual conditions alone won't achieve $0.05/kWh Levelized Cost of Storage (LCOS)



- 5¢/kWh LCOS enables dispatchable clean energy at competitive costs

Technology Strategy Assessment

Findings from Storage Innovations 2030
Lithium-ion Batteries
July 2023

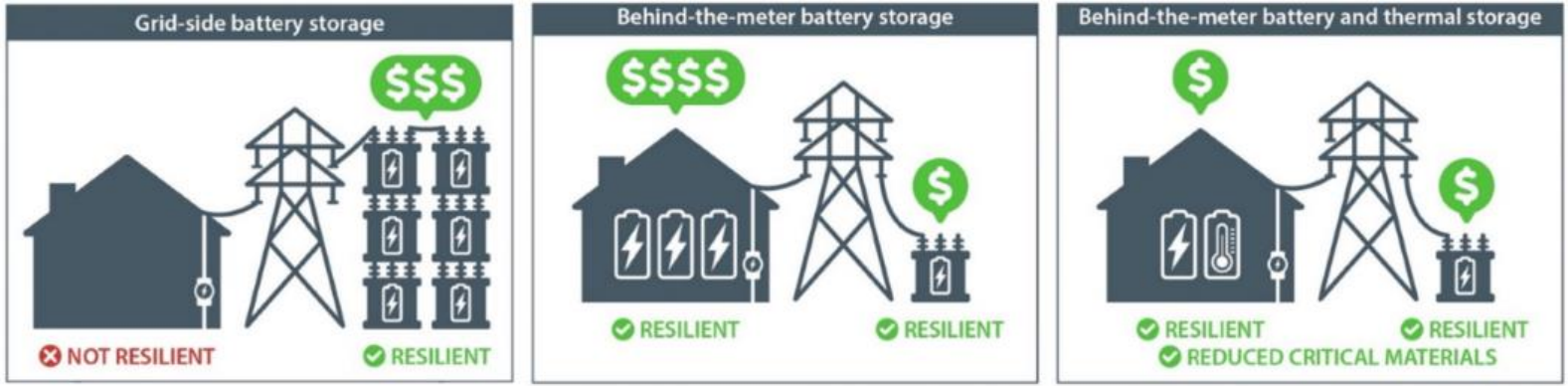
LDSS Technology Strategy Assessments

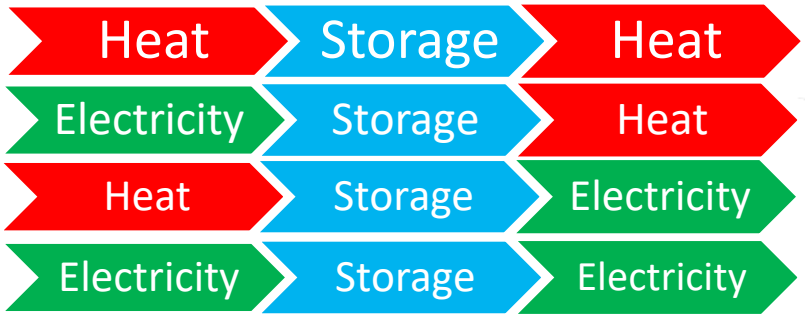
- **Released on July 19th, 2023**
- Results from the Flight Paths and Framework stakeholder engagement and analysis efforts

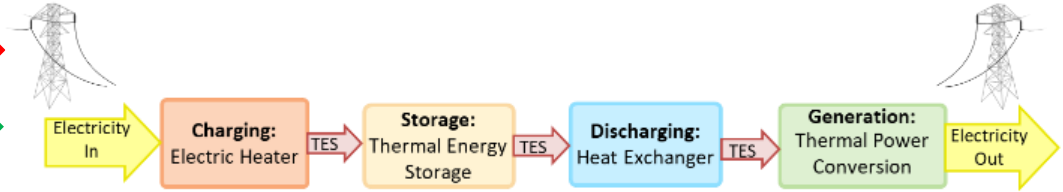
Eleven Reports Released

1. Methodology
2. Lithium-ion Batteries
3. Lead-Acid Batteries
4. Flow Batteries
5. Zinc Batteries
6. Sodium Batteries
7. Pumped Storage
8. Hydropower
8. Compressed Air Energy Storage
9. Thermal Energy Storage
10. Supercapacitors
11. Hydrogen Storage

Thermal Energy Storage Overview







TES cost estimation and idealized path forward

Recent federal legislation galvanizes support for energy storage at DOE

- **Bipartisan Infrastructure Law (BIL)**
  - 60 new DOE programs (48 demonstration & deployment)
  - Expands funding for 12 existing programs
  - $505 million for LDES demo program (OCED)
  - $10 billion for grid infrastructure programs (GDO)
- **Inflation Reduction Act (IRA)**
  - Funds investments and incentives totaling $370 billion
  - US to remain global leader in clean energy technology, manufacturing, and innovation
  - Includes investment tax credits (ITCs) and production tax credits (PTCs) for energy storage and new loan authorities given to DOE

Demonstration Announcements

- September 22, 2023: $325 million announced for long-duration energy storage demonstrations out of Office of Clean Energy Demonstrations (OCED)
  - 15 projects announced in 17 states
  - Intraday (10 to 36 hours) and multiday (36 to 160+ hours)
  - Innovative technologies including second life EV batteries, flow batteries, zinc batteries, and iron batteries
  - Six innovative demonstration projects selected at National Lab sites
- August 1, 2023: $19 million announced out of OE for innovative lithium-ion long-duration energy storage

THANK YOU

Ben Shrager

Storage Strategy Engineer

Energy Storage Division

U.S. DEPARTMENT OF ENERGY | OFFICE OF ELECTRICITY

www.energy.gov/oe/

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Meredith Roberts

Generac

Residential Storage: An essential piece of the climate puzzle

November 9, 2023

GENERAC®

About Generac Power Systems

Over 60 years of energy resiliency leadership.

Energy management products from thermostats, batteries, C&I solutions and more.

Mega Trends..

"Grid 2.0" – Evolution of the traditional electrical utility model

- Increasing intermittent generation sources and electrification of everything
- Supply/demand imbalances and energy prices drive migration to distributed energy resources

Home as a Sanctuary

- Increasing importance of the home with more people working from home and aging in place
- More intelligent and connected home and desire for improved energy efficiency

Impact of climate change

- More volatile and severe weather driving increased power outage activity
- Global regulation accelerating renewable investments

Growing investment in global infrastructure creating new opportunities

- Upgrading of aging and underinvested legacy systems
- Expanding investment for increasingly critical technology infrastructure

How far we've come

2002 off grid systems

- Standalone solutions for isolated sites – cabins, agricultural applications $4.90/watt.

2012 Net Metering battles

- At $1.00/watt, solar had become more accessible, utilities started sounding alarms of a duck curve

2022 – Penetration on some feeders is exceeding capacity

- With cost at $0.02/watt, some areas are heavily installed and restricting export.

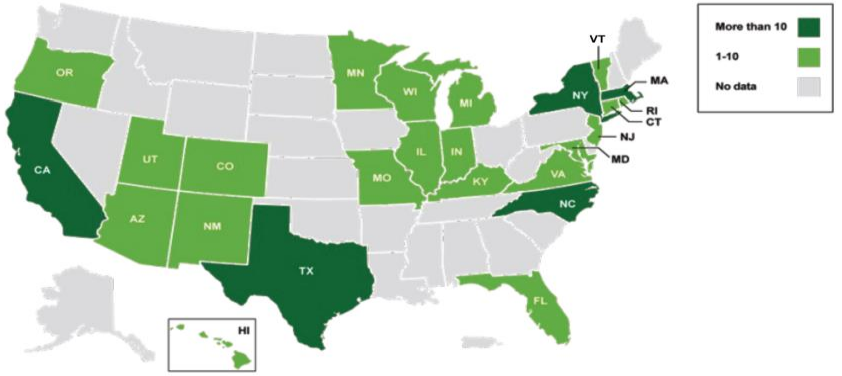
Where we are now -

- DOE releases VPP liftoff report, funds start flowing for GRIP awards

DOE's Imperatives For VPP Commercial Liftoff:

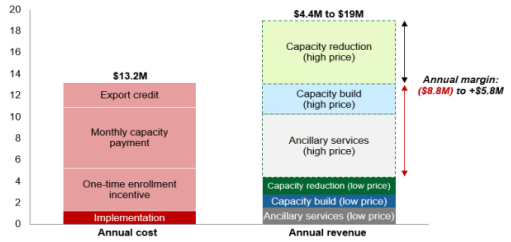
- Scale DER adoption through equitable benefits
- Expand VPP enrollment
- Standardize VPP operations
- Integrate into utility planning & incentives
- Integrate into wholesale markets

Number of third party VPPs procured by utilities in each state (2022)



Note: One VPP operating across states is counted multiple times (once for each state)
Source: Wood Mackenzie Grid Edge Services

Annual cost and revenue of illustrative Utility-integrated BTM battery VPP of 20 MW, $M



Costs

Participant incentives	Energy export credit	$0.20 per kWh ~4 hr per event; 144 events
	Battery capacity payment	$15.75 per kW-month
	Enrollment incentive	$1000 per kW (one-time)
VPP operations	Implementation	$450K per year & $9 per battery-month

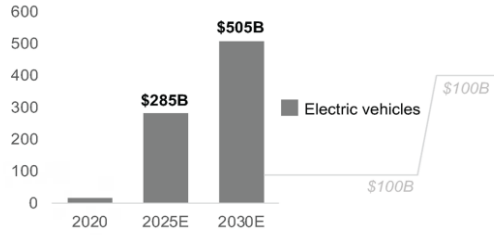
Revenues

Lo Hi	Capacity reduction	$80 to 375 per kW-year 7-9pm battery dispatch
Lo Hi	Capacity build	$60 to 200 per kW-year 10am-2pm charging
Lo Hi	Ancillary services	$80 to 375 per kW-year Fast frequency response

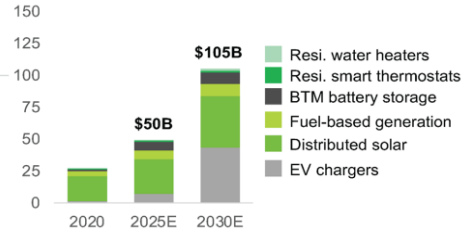
Note: One-time implementation costs and enrollment incentives for new batteries are annualized over five years.
Source: Industry interviews.

Annual projected investment in DERs, $B (2020-2030E)

In-year investment in EVs, $B (2020-2030E)



In-year investment in DERs (non-EVs), $B (2020-2030E)



A Growing Problem – Supply/Demand Imbalance

SUPPLY RELIABILITY DETERIORATING

- Climate change & severe weather
- One-way system prone to outage
- Infrastructure underinvestment
- Penalties for carbon intensity
- Increasing intermittency

DEMAND GROWTH ACCELERATING

- Electrification of everything
- Transportation, HVAC, appliances
- Next-generation infrastructure
- Home as a Sanctuary
- C&I processes

DERS* and the grid

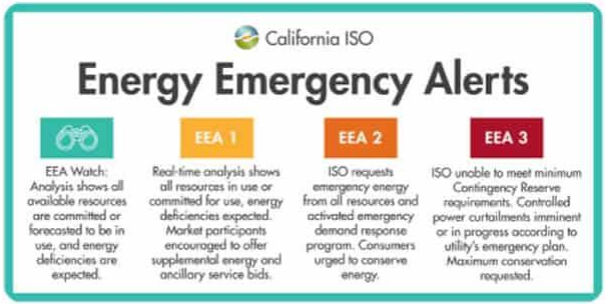
When the grid stays up – assets & aggregations to keep it that way

When the grid goes down – microgrids & individuals stay powered

* Distributed Energy Resources

California ISO @California_ISO · 20h

When an Energy Emergency Alert (EEA) 2 is called, the ISO requests emergency energy from all resources and has activated its demand response program. Use less #power to help avoid rotating #poweroutages. Learn more about #ISO EEAs: bit.ly/3cPV40e



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Tuesday, September 6

Emergency Alert now

CalOES, Conserve energy now to protect public health and safety. Extreme heat is straining the state energy grid. Power interruptions may occur unless you take action. Turn off or reduce nonessential power if health allows, now until 9pm.

DERS – Distributed Strength

California's DSGS/DEBA program

- Provides incentives for enrollment and capacity provided for grid emergencies
- Program year just concluded
- Approximately $500m

Generac Selected to Negotiate Federal Grants to Deploy Batteries, Solar and Grid Services

Generac Grid Services
Up to $50 Million Over 5 Years

Project | Deploy Heat Pumps, Batteries & Thermostats integrated in DERMs Platform

Location | Massachusetts
Customer | LMI Households

Partners | Utilities Eversource Energy, Cape Light Compact, Unitil, National Grid (Heat Pumps) IREC & ABCD (Community Outreach & Workforce) & Fraunhofer Center USA (Technical Evaluation)

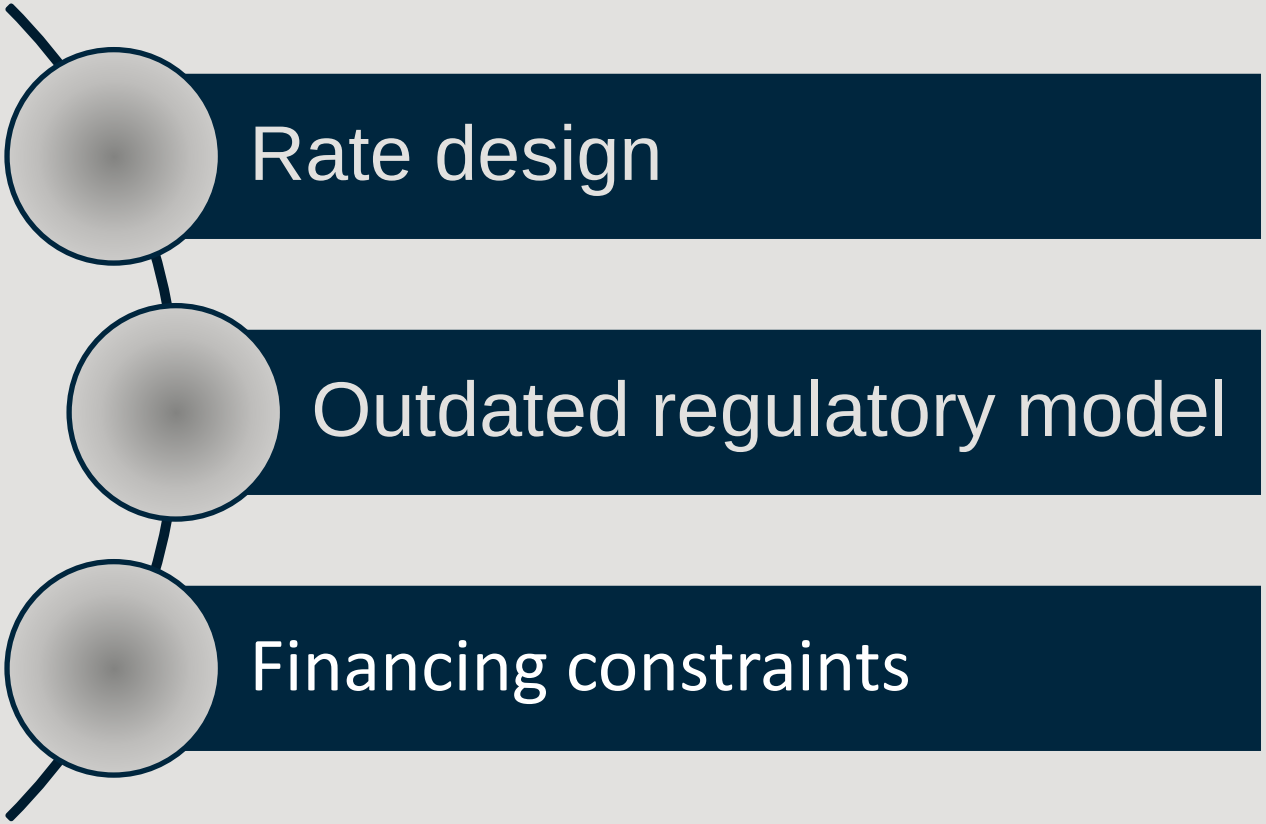
Generac Power Systems
Part of a $440 Million program

Project | Deploy Solar PV & Residential Batteries

Location | Puerto Rico
Customer | Vulnerable Households & Last Mile Communities

Partners | Posigen, FR-BLDM (Installer), Juapi (Installer and Service), IREC and Pathstone (Workforce Development & Community Engagement)

Barriers at the state & local level



Meredith.roberts@generac.com

Smart Tools for Efficient HVAC Performance (STEP) Campaign

Pacific Northwest NATIONAL LABORATORY

STEP CAMPAIGN

Scan this QR code to visit our website

Contact: christian.valoria@pnnl.gov

The STEP Campaign aims to increase adoption of smart diagnostic tools to streamline HVAC system performance testing and troubleshooting, reducing energy-wasting faults and improving occupant comfort.

To join the STEP Campaign, visit: bit.ly/3DFmEaE

HVAC Contractors and Technicians

- Reduce callbacks, improve consistency and quality, streamline processes
- Find out where to get training on smart diagnostic tools
- Be recognized for successful adoption of smart diagnostic tools!

Utilities and Program Implementers

- Streamline quality installation and quality maintenance programs
- Improve engagement with your contractors
- Be recognized for programs that utilize smart diagnostic tools!

HVAC Training Organizations

- Offer qualified training on System Performance with smart diagnostic tools
- Promote your training events
- Be recognized for providing training!

Weatherization Organizations

- Ensure your ASHP/CAC installations are operating at optimized efficiency
- Develop pilot with PNNL team
- Be recognized!

ORGANIZING PARTNERS

ACCA · BUILDING PERFORMANCE ASSOCIATION · CEE Working Together, Advancing Efficiency · HVAC Excellence · NATE · neea · U.S. DEPARTMENT OF ENERGY

Explore the Residential Program Guide

Resources to help improve your program and reach energy efficiency targets:

- Handbooks - explain *why* and *how* to implement specific stages of a program.
- Quick Answers - provide answers and resources for common questions.
- Proven Practices posts - include lessons learned, examples, and helpful tips from successful programs.
- Technology Solutions NEW! - present resources on advanced technologies, **HVAC** & **Heat Pump Water Heaters**, including installation guidance, marketing strategies, & potential savings.
- Health + Home Performance Infographic – spark homeowner conversations.

https://rpsc.energy.gov

Health + Home Performance Infographic

DOE's Health + Home Performance Infographic reveals the link between efficiency and health – something everyone cares about. Efficiency programs and contractors can use the question-and-answer format to discover a homeowner's needs.

The infographic is ideal for the "kitchen table" conversations where people decide what to do – and who they want to do it. It also has links for homeowners to find a qualified contractor if they do not already have one.

Download this infographic from DOE's Better Buildings Residential Network.

Looking for photos to help tell your energy efficiency story? Visit our image libraries: https://www.energy.gov/eere/better-buildings-residential-network/articles/image-libraries

Thank You!

Follow us to plug into the latest Better Buildings news and updates!

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Please send any follow-up questions or future call topic ideas to:
bbresidentialnetwork@ee.doe.gov