

DOE-OE Energy Storage Technology Advancement Partnership (ESTAP) Webinar

Behind-the-Meter Energy Storage: Comparing State Policies

November 17, 2022



U.S. DEPARTMENT OF
ENERGY



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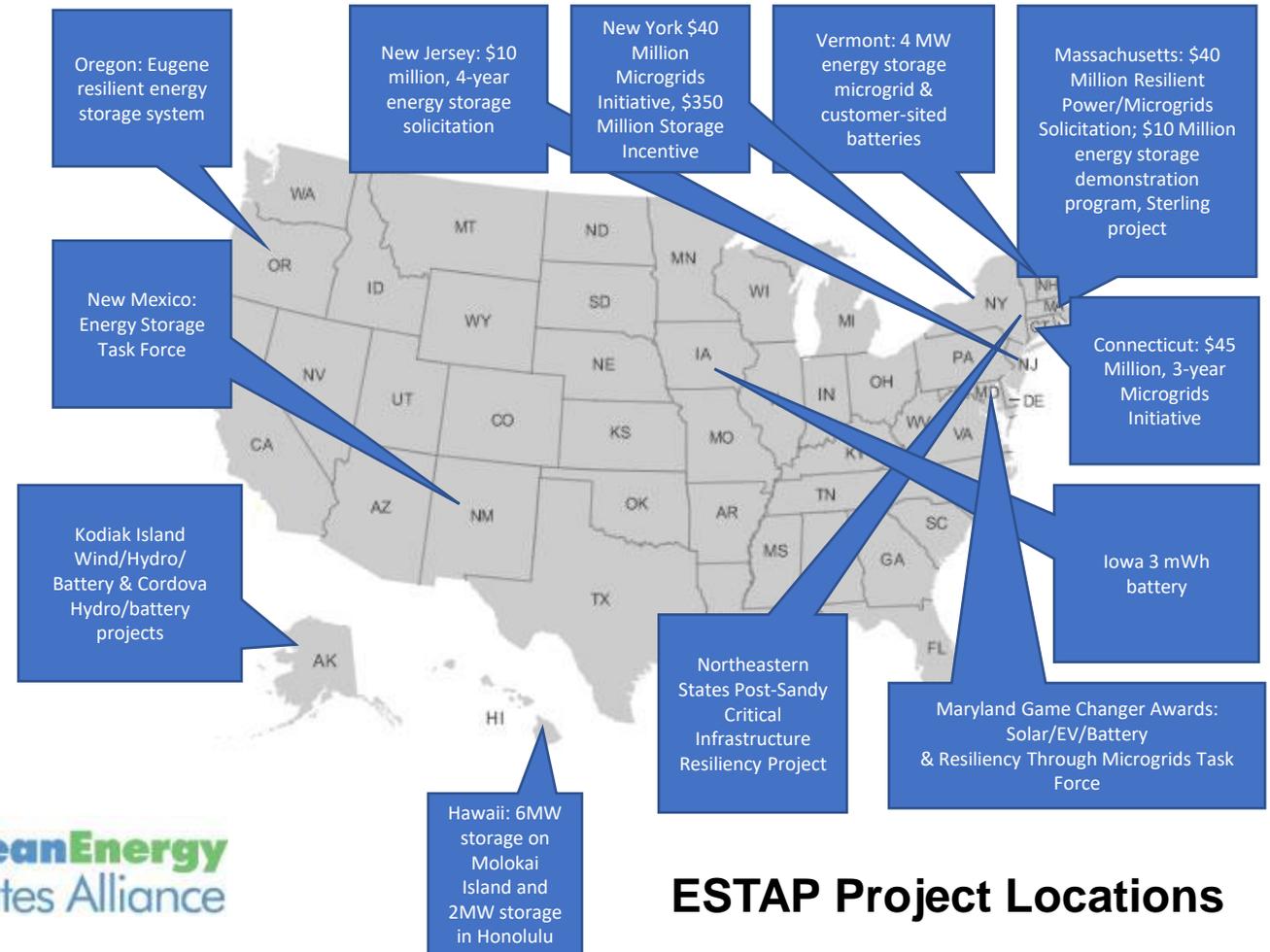


DOE-OE Energy Storage Technology Advancement Partnership

The **Energy Storage Technology Advancement Partnership (ESTAP)** is a US DOE-OE funded federal/state partnership project conducted under contract with Sandia National Laboratories.

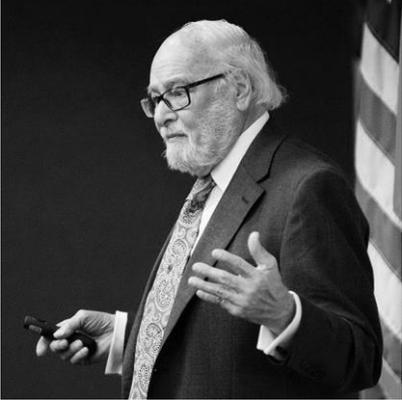
ESTAP Key Activities:

1. Facilitate public/private partnerships to support joint federal/state energy storage demonstration project deployment
2. Disseminate information to stakeholders
 - ESTAP listserv >5,000 members
 - Webinars, conferences, information updates, surveys.
3. Support state energy storage efforts with technical, policy and program assistance



ESTAP Project Locations

Thank You!



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Dan Borneo

Engineering Project/Program Lead,
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Webinar Speakers



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Todd Olinsky-Paul

Senior Project Director
Clean Energy States Alliance
(moderator)



Check The Stack: Assessment of BTM Energy Storage Policies Nationwide

Presenter:
Jeff Cook PhD
NREL



Database of State Incentives for Renewables & Efficiency®

Find Policies & Incentives Near You

Zip Code



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The Problem

- A variety of entities track BTM energy storage policies
- All this information is not always in the same place
- This information does not always identify interdependencies

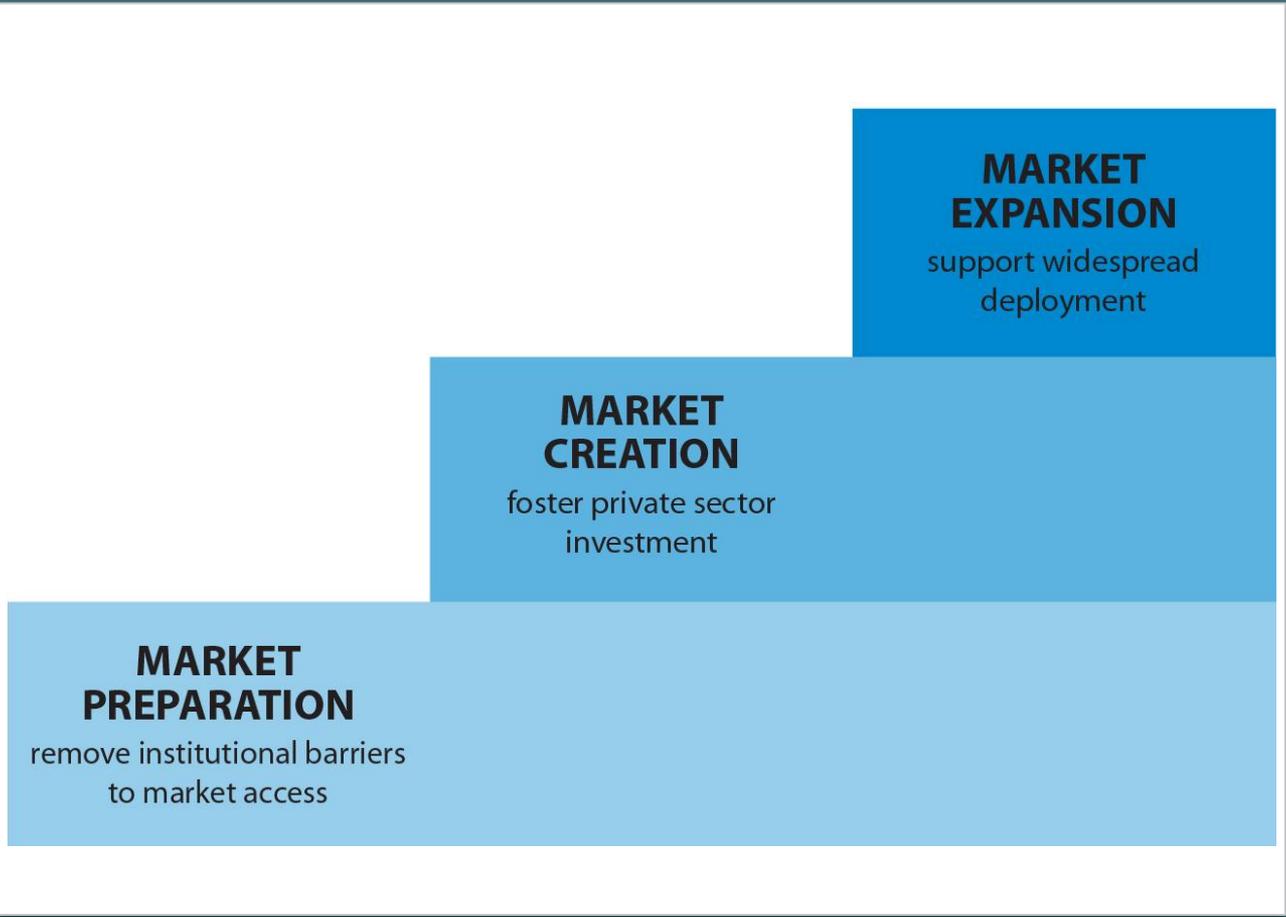


What Are We Going To Do?

- Project: Collect, structure, and build out state policy stacks for energy storage.
- **Outcome: End users can make more informed decisions about storage project viability by location.**

Key Challenges with Ranking Policies

- Not all policy is created equal.
 - Counting policies is not appropriate for gauging the attractiveness of a policy environment.
 - State policy can have a more significant impact than local policy
- Some policies are often pre-requisites to others.
- The content of a policy is critical in understanding its impact.



What is a policy stack?

How Did We Develop the Stacks?



Step 1: Update energy storage policy data



Step 2: Survey energy storage policy best practices literature



Step 3: Draft energy storage policy stack



Step 4: Vet policy stack with subject matter experts



Step 5: Disseminate results

Data Collection

- Energy storage policies collected from various databases
- Interviews with 19 representatives of 12 organizations
- We developed 11 parent policies
 - 31 policy questions associated with those policies
- Weighted policies based on their connection to the policy stack
 - Market preparation Category (2.0)
 - Market creation (1.0)
 - Market expansion (0.5)

Methodology Limitations

- State-centric
- Policy information may be hard to gather or unavailable
- Policy stacking framework
 - Weighting of policies

Interviewee Perspectives on Key Storage Policies

Table 1. Most-Referenced Energy Storage Policies

Policy	No. of References	Policy	No. of References
Interconnection	11	Equity	4
Net Metering	10	Carbon Emission Targets	4
Rate Design	10	Grid Modernization	3
Financial Incentives	10	Permitting	3
DER Aggregation	9	Value Stacking	3
FERC Order No. 2222	8	Technical Assistance for Public Utilities Commissions	2
Resilience	8	Cybersecurity	2
Clean Peak Standards/Renewable Portfolio Standards/Procurement Mandates for Storage	6	Utility Distribution Planning/Hosting Capacity	2
Demand Response	5	New Construction Standards	1
Non-Wires Alternatives	4	Utility/Customer Ownership	1

- 20 policies were referenced by interviewees.
- The top eight policies were reference by 6 or more interviewees.

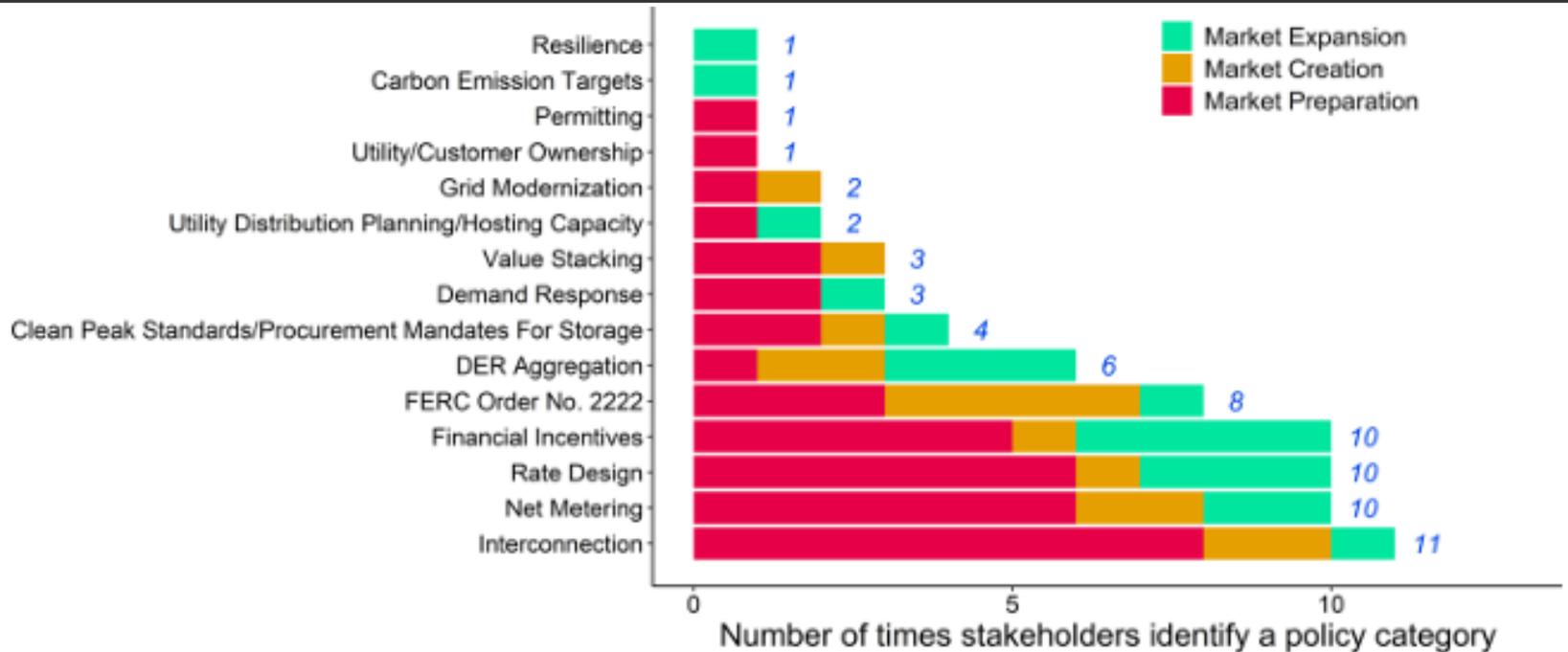


Figure 2. Interviewees' identification of key preparation, creation, and expansion policies

Interviewee Perspectives on Policy Category

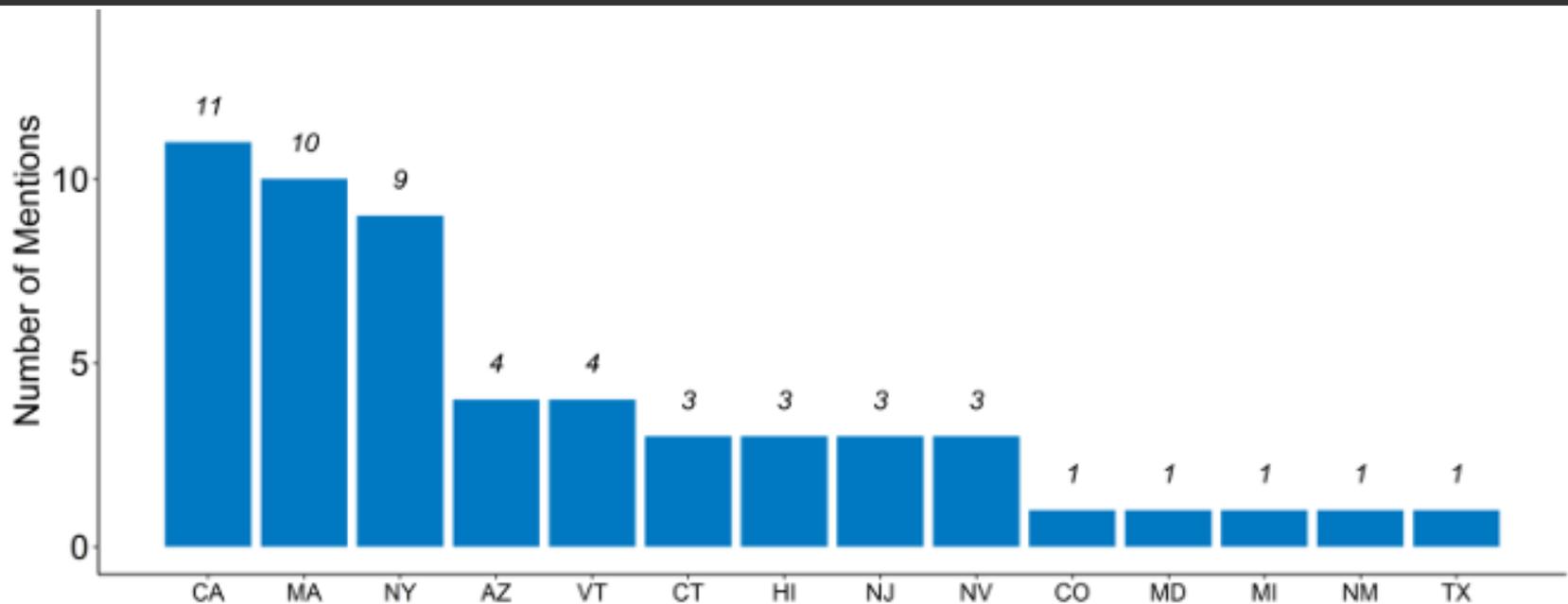


Figure 3. Interviewees' most-referenced states with perceived favorable BTM energy storage policy frameworks

Interviewees Perspectives on States with Strong BTM Policies

BTM Energy Storage Parent Policies

Table 2. State BTM Energy Storage Policy Stack and Parent Policy Description

Policy Category	Parent Policy	Definition
Market Preparation	Planning and Permitting	The state has planned for BTM energy storage, piloted its use in different situations, developed permitting standards and/or guidance, and has undertaken other related activities.
	Interconnection	The state or utilities in the state have established requirements for connecting BTM energy storage to the grid.
	Compensation	The state or utilities in the state have established clear BTM energy storage compensation mechanisms.
	Rate Making	Time-of-use, demand charge, and/or other rate mechanisms are employed or available in the state.
Market Creation	Wholesale Market	When a state has rules on enabling BTM energy storage participation in wholesale markets, they are clear.
	Mandate	The state has adopted mandates that incentivize or require BTM energy storage.
	Distributed Energy Resource (DER) Aggregation	The state or utilities in the state have approved, developed and/or operate DER aggregation programs.
Market Expansion	Storage Funding and Incentives	The state offers financial incentives for BTM energy storage development.
	Resilience	The state has an energy resilience policy or programs in operation that incorporate BTM energy storage.
	Equity	The state considers BTM energy storage development impacts on disadvantage communities.
	Emission and Life Cycle Impact	The state has an emission target and an end-of-life battery storage program.

Market Preparation Policies

Table 3. State BTM Energy Storage Parent Policy Stack and Child Policy Questions^a

Policy Category	Parent Policy	Questions
Market Preparation	Planning and permitting	Has an energy storage policy/economic study been completed in the state?
		Is or has a BTM energy storage pilot program been completed in the state?
		Has the state modified local government permitting requirements specific to BTM energy storage?
		Does the state allow or mandate the inclusion of energy storage in utility integrated resource plans?
		Has the state approved or otherwise required consideration of non-wires alternatives or DERs to defer, mitigate, or obviate the need for certain transmission and distribution investments?
		Does the state have a policy on utility ownership of energy storage assets?
		Does the state have a policy addressing multiple use applications for energy storage?
	Interconnection	Do the state's interconnection requirements expressly address BTM energy storage export control?
		Does a utility in the state publish a hosting capacity map?
	Compensation	Does the state allow BTM energy storage to be eligible for net metering compensation?
		Has the state replaced its net energy metering programs with BTM energy storage-specific tariffs?
		Does a utility in the state have demand response programs?
	Ratemaking	Does at least one utility in the state offer time-of-use rates?
		Does the largest utility in the state offer time-of-use rates?
		Does at least one utility in the state offer demand charge rates?
		Does the largest utility in the state offer demand charge rates?

Market Creation Policies

Wholesale market access

- Is FERC 841 being partially implemented in the wholesale market in the state?
- Is FERC 841 being fully implemented in the wholesale market in the state?
- Has FERC order 2222 been partially implemented in the wholesale market in the state?
- Has FERC order 2222 been fully implemented in the wholesale market in state?

Mandates

- Does the state have a renewable portfolio standard (or equivalent) of 80% or more?
- Does the state have a mandate or target for any energy storage?
- Does the state have a mandate for BTM energy storage?

DER Aggregation

- Has at least one utility in the state implemented a DER aggregation program?
- Has the largest utility in the state implemented a DER aggregation program?

Market Expansion Policies

Market Expansion	Storage Funding and Incentives	Does the state offer financial incentives for BTM energy storage development?
	Resilience	Has a resilience or microgrid-related rate structure been approved or implemented in at least one utility in the state?
		Has the state implemented any policies or programs to encourage microgrid/resilience development?
	Equity	Does the state consider low- and moderate-income incentives for BTM energy storage?
	Emission and Life Cycle Impact	Does the state have at least one energy storage technology end-of-life program?
		Does the state have a target to reduce carbon emissions?

State Policy Scores

- Maximum score is 13 points
 - Market preparation: 8
 - Market Creation: 3
 - Market Expansion: 2
- Score Range: 2.5 – 13
- Average score: 4.8
- **Though we are weighting scores, the raw scores show similar results.**

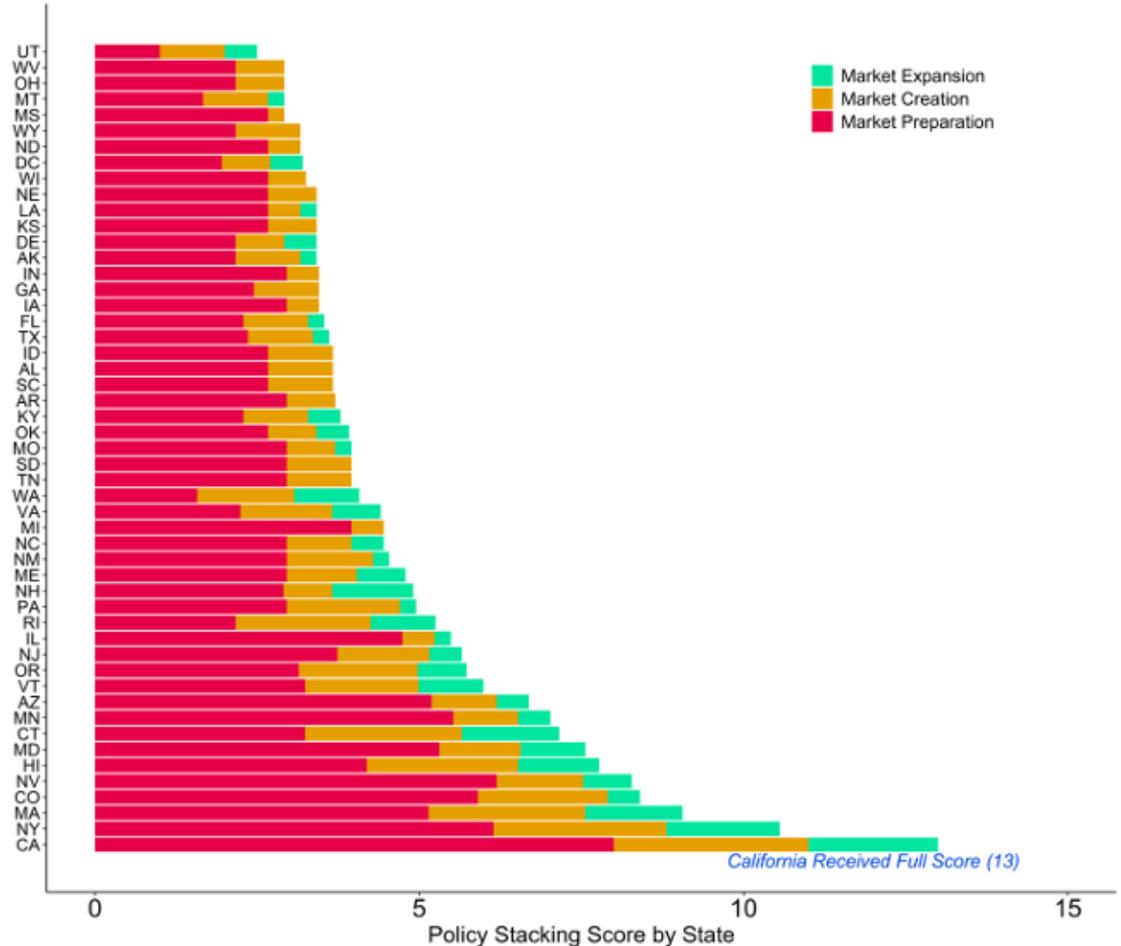


Figure 4. State policy stacking score in market preparation, creation, and expansion categories

Top 15 states and Interviewee Perspectives on State Policies

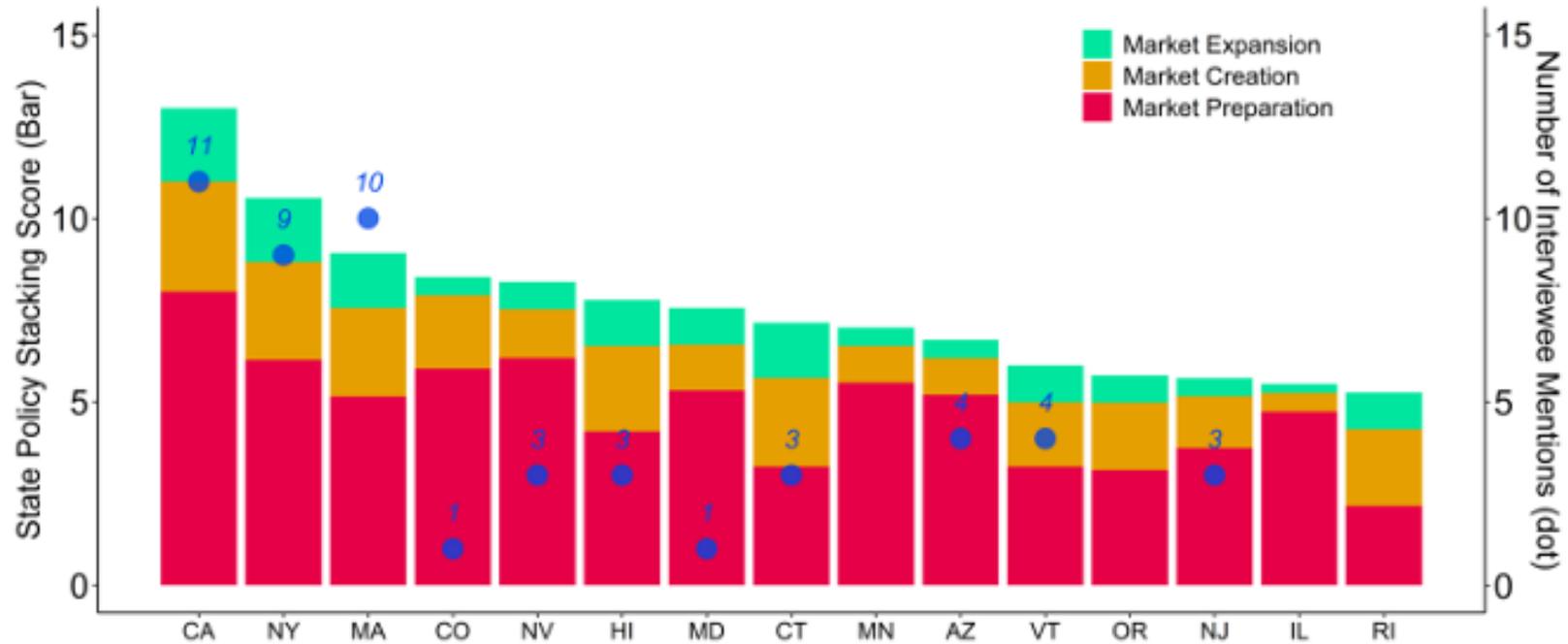


Figure 5. Top 15 highest state energy storage policy stack scores

Market Preparation

- Planning and Permitting
 - 32 states and DC score
- Interconnection
 - 12 states score
- Compensation
 - 44 states and DC score
- Ratemaking
 - 39 states and DC score

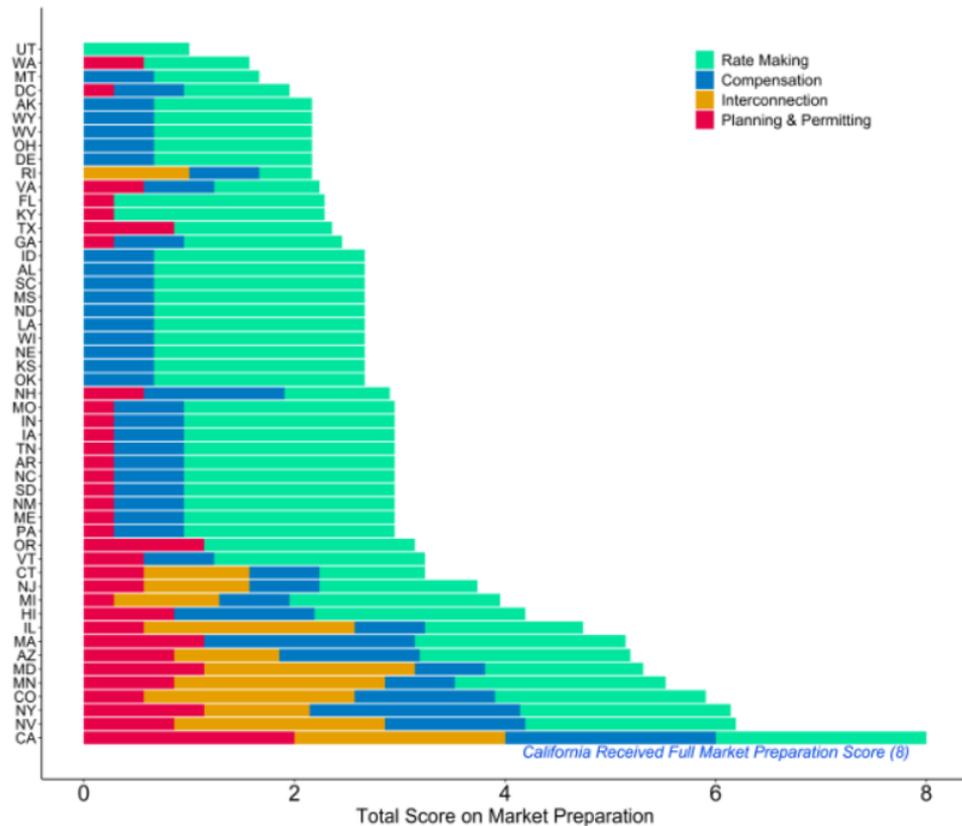


Figure 6. State policy stacking scored in market preparation category

Market Creation

- 50 states and DC score in this category
- Wholesale Market Access
 - 32 states and DC
- Mandate
 - 30 states and DC
- DER Aggregation
 - 16 states

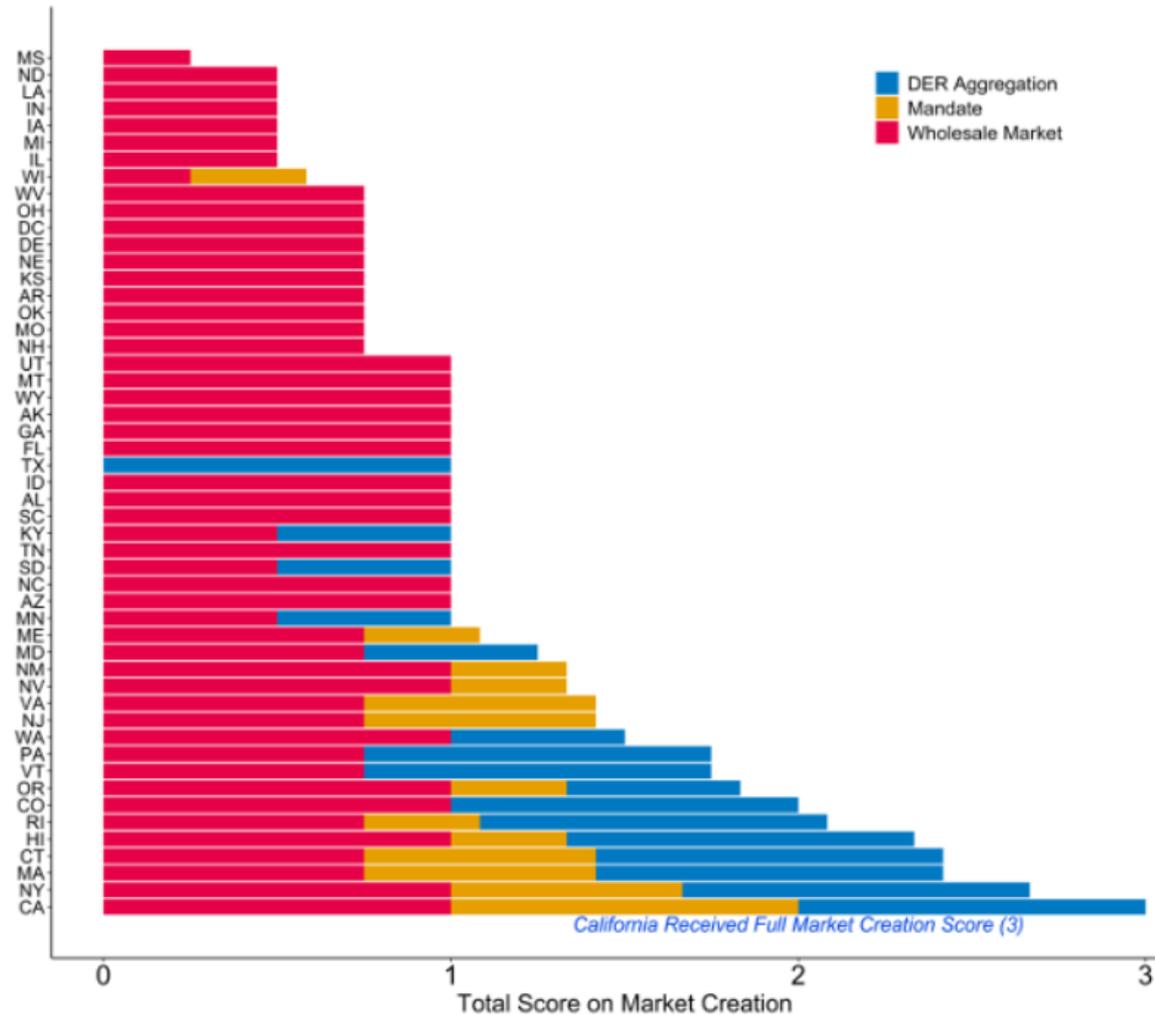


Figure 7. State policy stacking scored in market creation category

Market Expansion

- 50 states and DC score on this category
- Storage Funding and Incentives
 - 18 states score
- Resilience
 - 18 states score
- Equity
 - 5 states score
- Emission & Life Cycle Impact
 - 23 states score

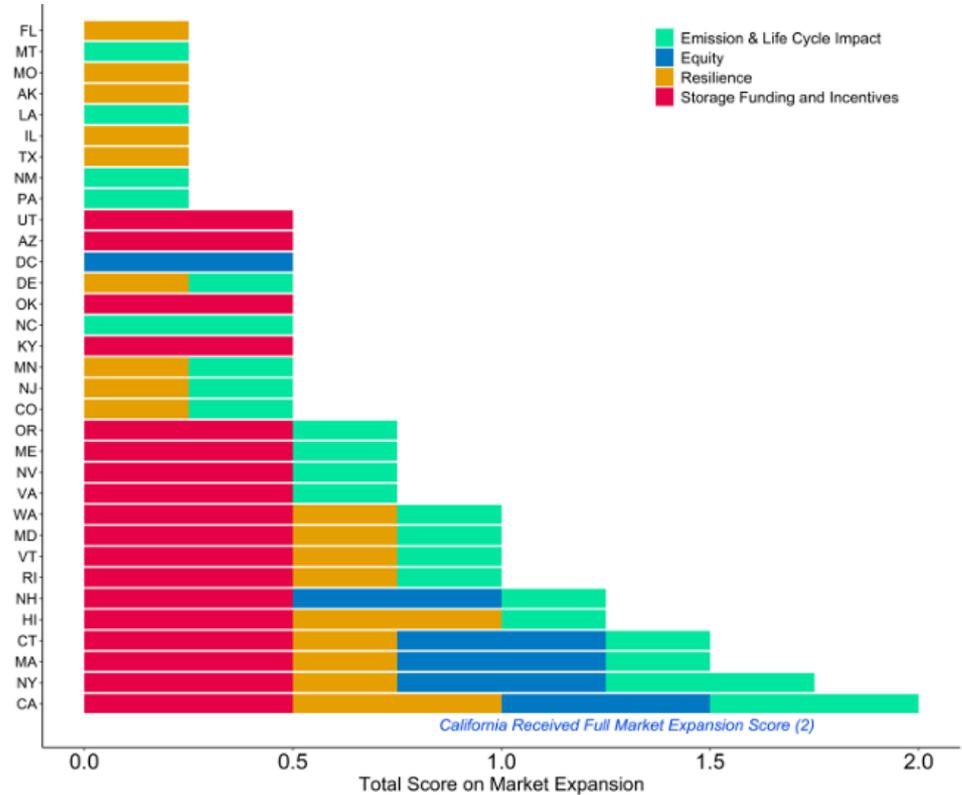


Figure 8. State policy stacking scored in market expansion category
 Eighteen states that scored zero points in this category were excluded from the figure.

Conclusions and Next Steps

- 11 parent policies and 31 child policies
- California leads, followed by NY, MA, NV, and CO
- Future work opportunities
 - Expand the policy stack for new policies
 - Improve our coverage of existing policies
 - Evaluate policies impacts on deployment

<https://data.nrel.gov/submissions/192>

<https://www.nrel.gov/docs/fy22osti/83045.pdf>

Questions and Thank You!

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NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.



This webinar was presented by the DOE-OE Energy Storage Technology Advancement Partnership (ESTAP)

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