Energy Storage Policy Best Practices for New England States

Todd Olinsky-Paul
Senior Project Director
Clean Energy States Alliance / Clean Energy Group
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One size does not fit all

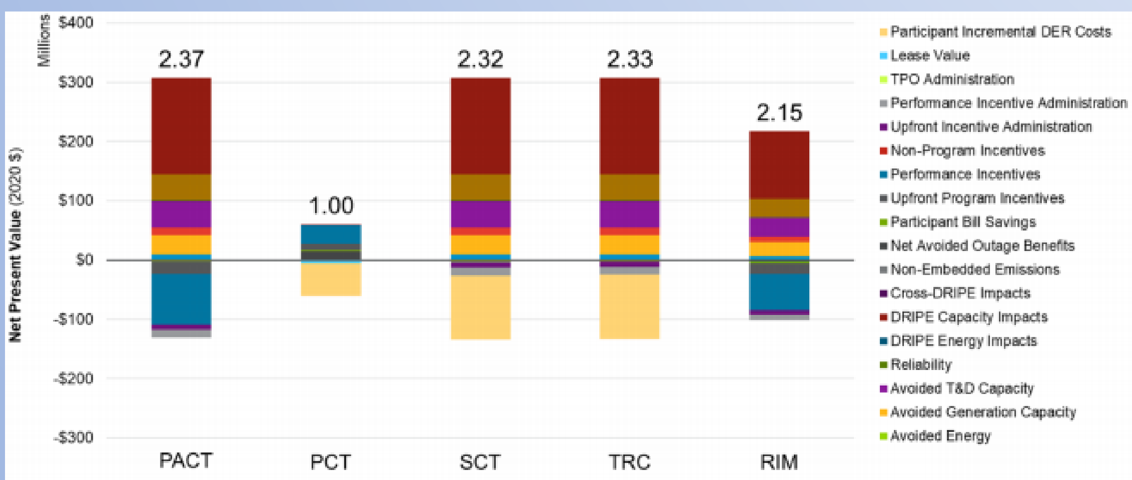
- Each state faces unique circumstances and has unique needs, even when they exist within the same market frame (ISO-NE).
- One state cannot simply adopt wholesale the policies and programs of another state.
- However, best practices are starting to emerge…

Policy Best Practices for New England States

1. Identify storage benefits not priced or monetizable in existing markets
2. Establish a monetary value for each storage benefit; use in cost/benefit analyses and incentive rate-setting
3. Create incentives to support storage operations that further state policy goals (incentivize storage *use*, not just *deployment*)
4. Set ambitious clean energy or emissions reduction goals and explicitly include energy storage as an eligible technology
5. Add storage into existing incentive and market-based programs
6. Incorporate equity considerations from the start
7. Support diverse storage ownership, applications and business models
8. Proactively address needed regulatory changes (auto-mechanics)
9. Replicate and improve successful programs from neighboring states
10. Increase storage expertise
11. If needed, demonstrate storage in various settings; don't over-rely on grants

1&2. Identify storage applications, assign value for CBAs

- Value does not equal price. What is valuable is not always priced or monetizable in current markets.
  - Examples of (sometimes) monetizable applications: peak demand reduction, frequency regulation, energy arbitrage.
  - Examples of (usually) non-monetizable applications: increased resilience, reduced land use, jobs creation.
- It is important to assign value to storage benefits even if markets for those benefits are absent. Low or estimated value is better than no value at all.



Connecticut customer Battery Program Cost Benefit Analyses:

Net Present Value of Cost/Benefit Categories by Cost Test

PACT = Program Administrator Cost Test **PCT** = Participant Cost Test **SCT** = Societal Cost Test
TRC = Total Resource Cost Test **RIM** = Ratepayer Impact Measure

Non-energy benefits of distributed energy storage in Massachusetts

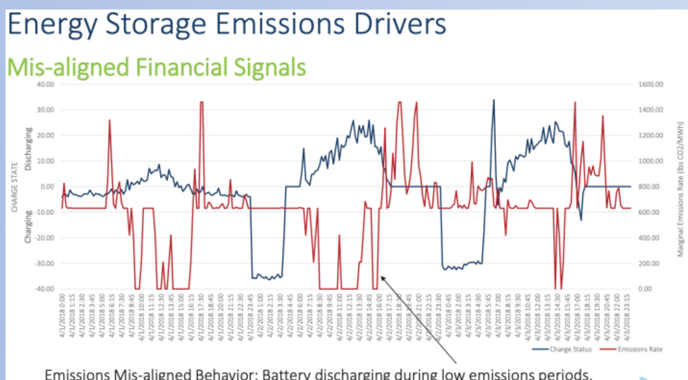
	Non-Energy Benefit (2018$)
1) Avoided power outages	
Battery storage helps avoid outages, and all of the costs that come with outages for families, businesses, generators and distribution companies	Residential: **$1.72**/kWh Commercial/Industrial: **$15.64**/kWh
2) Higher property values	
Installing battery storage in buildings increases property values for storage measure participants by: (1) increasing leasable space; (2) increasing thermal comfort; (3) increasing marketability of leasable space; and (4) reducing energy costs	**$5,325/**housing unit for low-income single family participants **$510/**housing unit for owners of multi-family housing
3) Avoided fines	
Increasing battery storage will result in fewer power outages and fewer potential fines for utilities	**$24.8 million** in 2012
4) Avoided collections and terminations	
More battery storage reduces the need for costly new power plants, thereby lowering ratepayer bills, and making it easier for ratepayers to consistently pay their bills on time. This reduces the need for utilities to initiate collections and terminations	Terminations and Reconnections: **$1.85**/year/participant Customer calls: **$0.77**/year/participant
5) Avoided safety-related emergency calls	
Increasing battery storage results in fewer power outages, which reduces the risk of emergencies and the need for utilities to make safety-related	**$10.11**/year/participant
6) Job creation	
More battery storage benefits society at large by creating jobs in manufacturing, research and development, engineering, and installation	**3.3 jobs**/MW **$310,000**/MW
7) Less land used for power plants	
More battery storage reduces the need for peaker plants, which are more land-intensive than storage installations—benefitting society by allowing more land to be used for other purposes	**12.4 acres**/MW

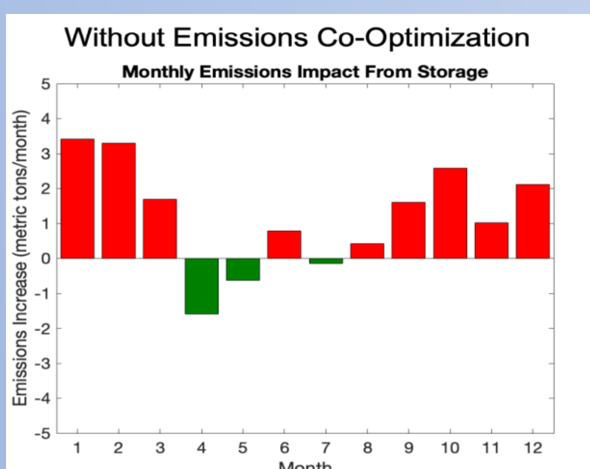
Analysis by Applied Economics Clinic

3. Provide meaningful incentives

- **Storage is a multi-use tool.** States should use incentives to align storage value stack optimization with state policy goals.
- Incentivize storage **operations** – not just storage **deployment**.

BEFORE





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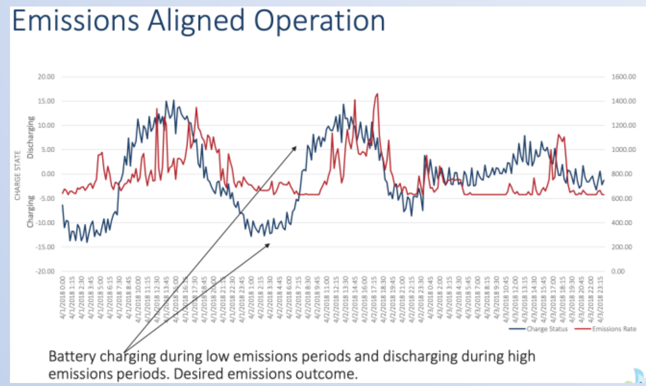
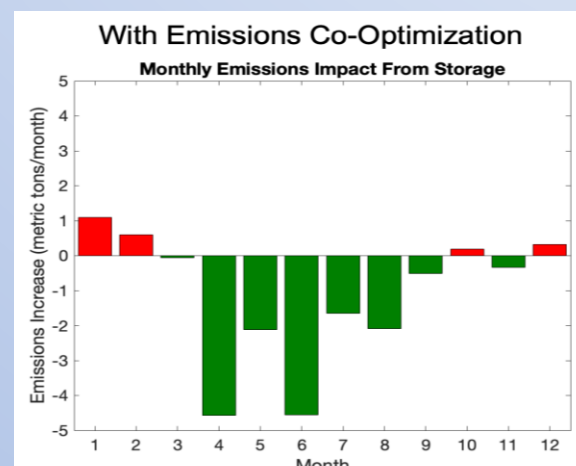




Example:

California solved their emissions problem by making 50% of the SGIP battery incentive contingent on batteries charging and discharging *at the right times*.

4&5. Set policy goals, incorporate storage into programs that support these goals

- Not every state will adopt an energy storage target, but every state has clean energy targets. Storage incentives should support established clean energy targets and other social benefit objectives.
  - Connecticut: 100% carbon-free electricity by 2040
  - Maine: 100% clean energy by 2050
  - Massachusetts: Net-zero greenhouse gas emissions by 2050, Clean Peak Standard 46.5% by 2050
  - New Hampshire: 25.2% RPS by 2025
  - Rhode Island: 100% renewable energy electricity by 2030
  - Vermont: 75% RES by 2032

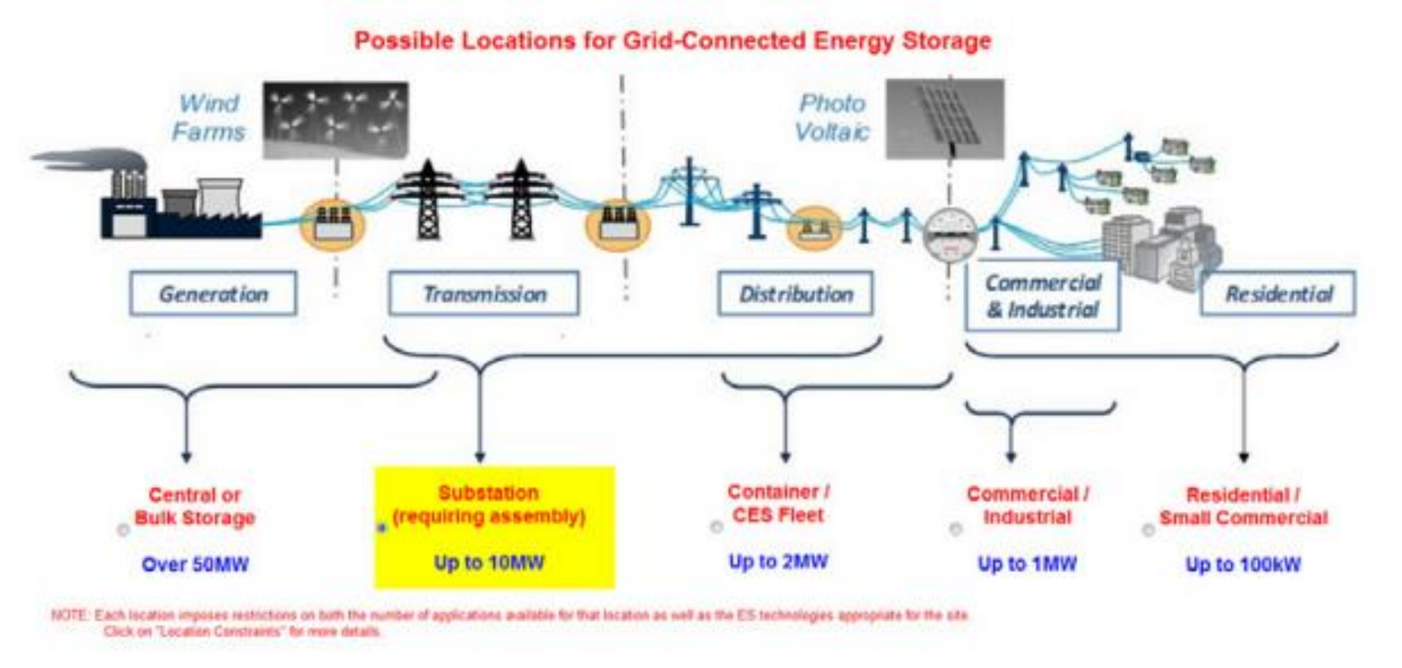
- Storage can be added to existing programs. This is often easier than designing a new program and finding new money to support it
  - Storage added to solar incentive (MA SMART RI Energy Storage Adder)
  - Storage added to energy efficiency (ConnectedSolutions battery program (MA, RI, CT, ME) and customer battery demand response (VT, NH)
  - Storage eligibility in RPS (ME, VT)

6. Incorporate equity provisions from the start

- Incorporate LMI/equity provisions in programs and policy <u>from the start</u>, not as an afterthought
  - MA ConnectedSolutions missing equity budget and CBA, vs CT PURA straw proposal)
- Carve-outs are not sufficient; increased incentive rates can be effective (CA SGIP)
- Look for opportunities to provide storage benefits (cost savings and resilience) to facilities serving underserved communities
  - Schools
  - FQHCs
  - Community buildings
  - Multifamily affordable housing

7. Support a diverse storage marketplace

- Large/utility scale and small scale/distributed storage
- FOM and BTM placement
- Residential and commercial/industrial customers
- Diverse ownership models (utility owned, merchant owned, customer owned, leasing, PPAs, VPPs)



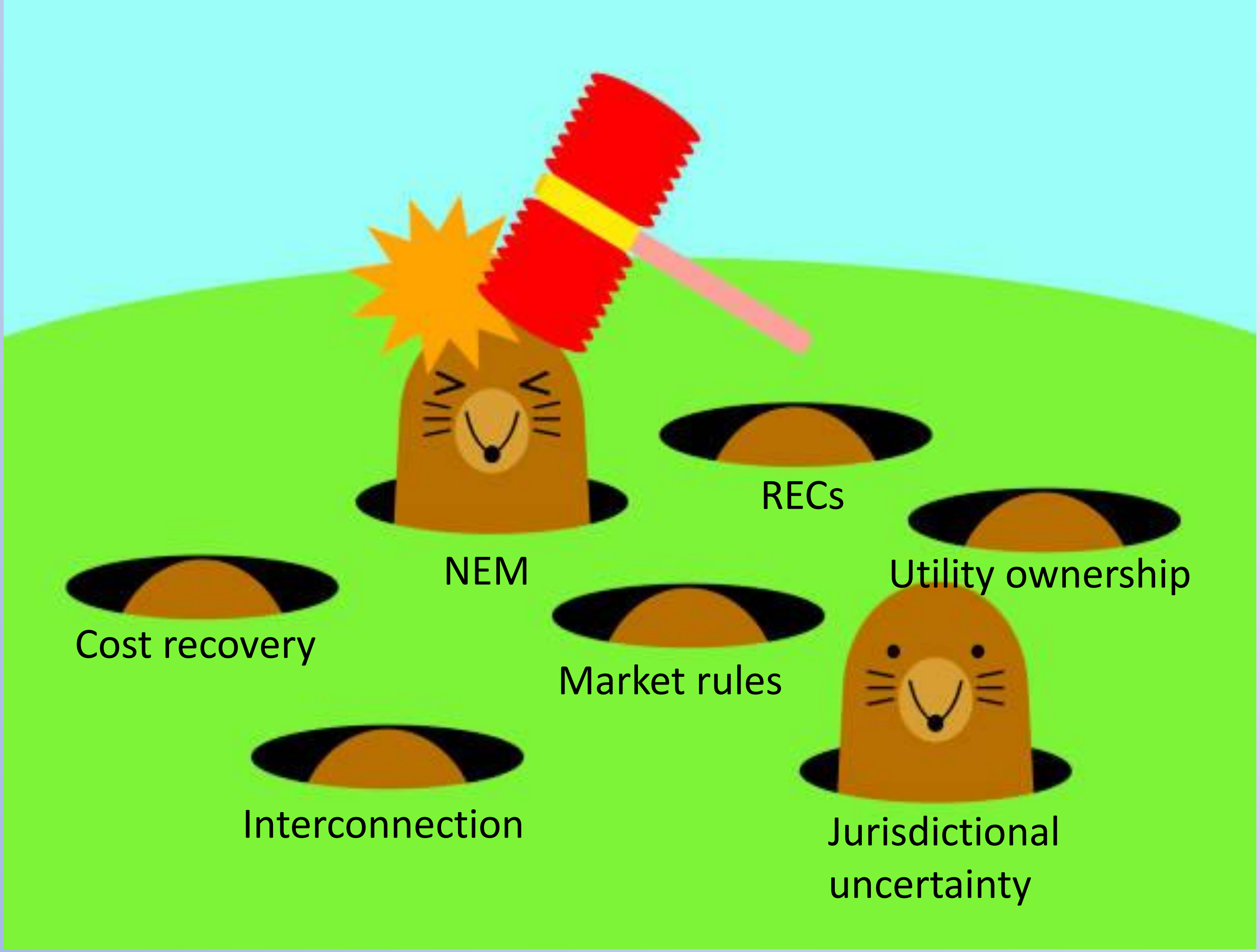
8. Address auto-mechanics ahead of time

- Regulatory changes will be needed when new policy and programs are adopted
- Issues such as interconnection, metering, NEM rules, REC creation/ownership can derail programs, frustrate users and delay success in meeting policy goals

  - MA - 900 MW SMART applications delayed due to "cluster studies" (hosting capacity)
  - NEM dockets in numerous states
  - Capacity ownership questions
  - Metering requirements (MA, VT)
  - Rule clashes (RI)

Did somebody send for a mechanic?

Be proactive – don't play regulatory whack-a-mole!



There will always be someone happy to explain to you why it can't be done

Thank You to:

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Dan Borneo, Sandia National Laboratories

Todd Olinsky-Paul

Project Director

Clean Energy States Alliance

Todd@cleanegroup.org

ESTAP Website: http://bit.ly/CESA-ESTAP

ESTAP Listserv: http://bit.ly/EnergyStorageList