Energy Storage in Connecticut

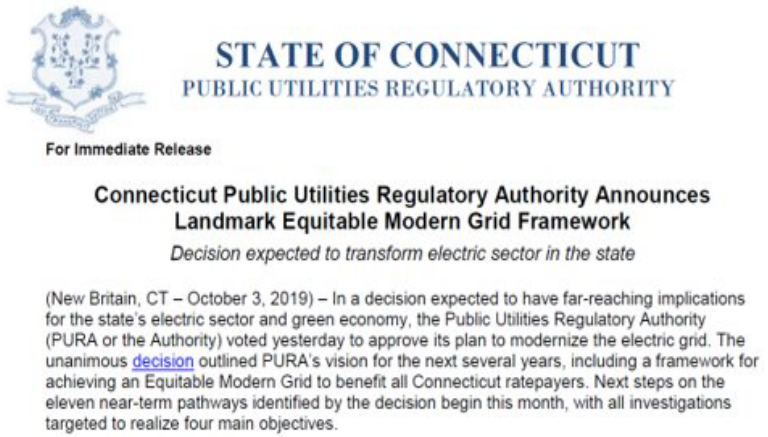
Connecticut Public Utilities Regulatory Authority

December 7, 2023

Equitable Modern Grid

On October 2, 2019, PURA issued an Interim Decision in Docket No. 17-12-03 outlining a framework for realizing a modern electric grid in CT and four key objectives.

Storage is an important component of an equitable modern grid.



STATE OF CONNECTICUT
PUBLIC UTILITIES REGULATORY AUTHORITY

For Immediate Release

Connecticut Public Utilities Regulatory Authority Announces Landmark Equitable Modern Grid Framework

Decision expected to transform electric sector in the state

(New Britain, CT – October 3, 2019) – In a decision expected to have far-reaching implications for the state's electric sector and green economy, the Public Utilities Regulatory Authority (PURA or the Authority) voted yesterday to approve its plan to modernize the electric grid. The unanimous decision outlined PURA's vision for the next several years, including a framework for achieving an Equitable Modern Grid to benefit all Connecticut ratepayers. Next steps on the eleven near-term pathways identified by the decision begin this month, with all investigations targeted to realize four main objectives.

1. Support, or remove barriers to the growth of CT's green economy;

2. Enable a cost-effective, economy-wide transition to a decarbonized future;

3. Enhance customer access to a resilient, reliable, and secure commodity;

4. Advance the ongoing energy affordability dialogue in the State; particularly for underserved communities.

CT Storage Goals

Public Act 21-53 set a statewide deployment target for **1,000 MW** of energy storage by 2031

Section 2 of Public Act 21-53 authorized PURA to establish the **Energy Storage Solutions (ESS)** Program

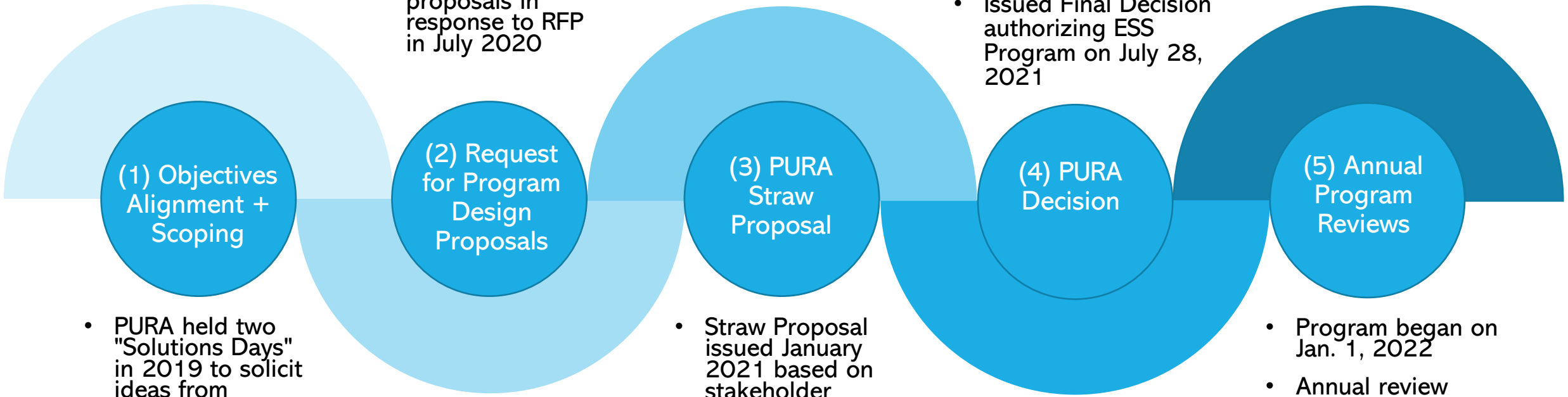
ESS is a nine (9) year incentive program with a goal of deploying **580 MW** of electric storage systems throughout Connecticut, as shown below

ESS Program Deployment Targets

Deployment targets	2022-2024	2025-2027	2028-2030	Total
Residential	50 MW	100 MW	140 MW	290 MW
Commercial & industrial	50 MW	100 MW	140 MW	290 MW
Total	100 MW	200 MW	280 MW	580 MW

Remaining 420 MW to 1,000 MW goal to be procured by DEEP

ESS Development Process



- PURA held two "Solutions Days" in 2019 to solicit ideas from stakeholders on electric storage programs and programs designs

- Requested program design proposals from stakeholders; Received 9 proposals in response to RFP in July 2020

- Straw Proposal issued January 2021 based on stakeholder proposals and other docket/public information

- PURA issued Draft Decision and received stakeholder feedback
- Issued Final Decision authorizing ESS Program on July 28, 2021

- Program began on Jan. 1, 2022
- Annual review process analyzes key program metrics and makes strategic changes

ESS Program Overview

ESS began on January 1, 2022 and is administered by the Connecticut Green Bank, along with the electric utility companies (Eversource and United Illuminating)

ESS is open to both residential and commercial customers

ESS customers can participate in either **passive or active dispatch**

- If participating in **passive dispatch**, customers receive an upfront incentive to lower a battery's upfront cost and is subject to certain operating parameters
- If participating in **active dispatch**, customers receive a biannual performance incentive, based on the battery's average kW performance in all seasonal active dispatch events

ESS Upfront Incentives

Commercial Upfront Incentives

Installed Capacity (MW)	Small Commercial ($/kWh)	Large Commercial ($/kWh)	Industrial ($/kWh)	Priority Customer Adder[1]
50	$200	$175	$100	+25%
100	$200	$175	$100	+25%

Residential Upfront Incentives

Incentive Step	Installed Capacity (MW)	Baseline ($/kWh)	Underserved Community ($/kWh)	Low-Income ($/kWh)	Grid Edge Adder
1	10	$250	$450	$600	+50%
2	15	$212.5	$450	$600	+50%
3	25	$162.5	$450	$600	+50%

Customer classes:

- Commercial classes: (1) **small commercial** (<200kW annual peak demand); (2) **large commercial** (200-500kW annual peak demand); (3) **industrial** (>500kW annual peak demand)
- Residential classes: (1) **standard customer**; (2) **underserved customer** (residing in a Distressed Municipality); **low-income customer** (households with incomes below 60% of the state median income)

Upfront incentive adder:

- Commercial customers receive a 25% adder if the customer is **at least one** of the following: a **small business** (<200kW annual peak demand); a **critical facility** (statutory definition); a customer **replacing a fossil fuel generator**; or located on the **grid edge** (circuits most prone to power outages).
- Residential customers receive a 50% adder if the customer is located on the **grid edge**.

Customers are required to discharge their battery evenly between 3pm – 8 pm daily on non-holiday weekdays in June, July, and August (i.e., participate in **passive dispatch**) for 10 years.

ESS Performance Incentive

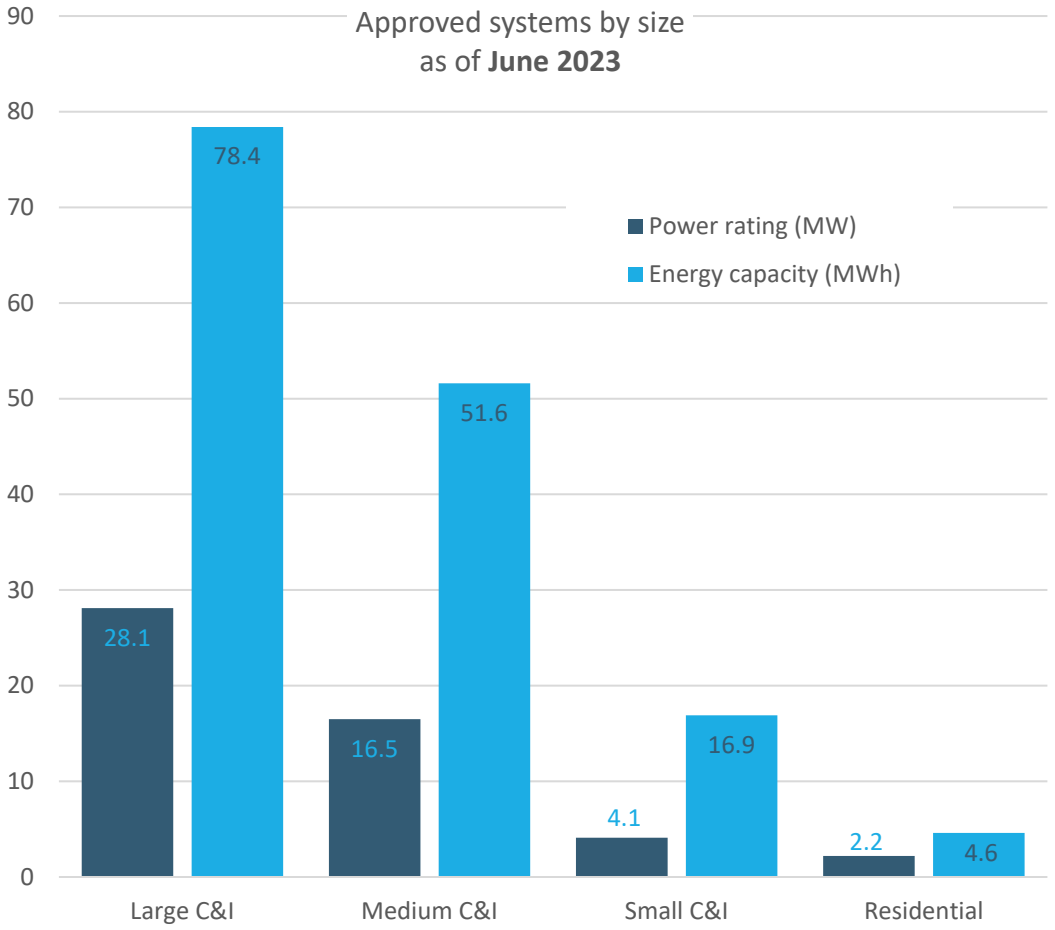
Projects participating in **active dispatch** are eligible for an additional, performance-based incentive:

Years 1-5		Years 6-10	
Summer ($/kW)	Winter ($/kW)	Summer ($/kW)	Winter ($/kW)
$200	$25	$115	$15
$225 annually		$130 annually	

The parameters of **active dispatch** are as follows:

	Summer	Winter
Season Dates	June 1 – September 30	November 1 – March 31
Number of Events	30-60	1-5
Event Duration	1 - 3 hours	1 - 3 hours
Timing	12:00 pm – 9:00 pm	12:00 pm – 9:00 pm

ESS Deployment to Date



As of **November 2023**

77.29 MW allocated

0.548 MW in service

Commercial enrollment has far exceeded ESS's deployment targets

- Original target was 50 MW of commercial enrollment by the end of 2024
- Currently, 75.3 MW of commercial projects are enrolled in ESS

Residential enrollment is falling short of ESS's deployment targets

- Just over 2 MW of residential projects are enrolled in ESS
- PURA has recently taken steps to increase residential enrollment, including: (1) ordering a comprehensive review of the ESS enrollment process; (2) approving new battery technologies for ESS; and (3) increasing residential upfront incentive rates

Source: DEEP presentation to ISO-NE Distributed Generation Forecast Working Group.

ESS Development Process: Annual Review

Annual process to analyze key ESS Program metrics and make strategic changes (See Decision in Docket No. 17-12-03RE09)

- Annual Docket No. XX-08-05 ("XX" = 20XX)

Make annual adjustments / improvements to ESS Program; ensure Program is meeting targets (e.g., deployment and Justice40)

Latest annual review: Docket No. 23-08-05 reviewed ESS Program Year 2 (2023) deployment and outcomes

- Approved Year 3 (2024) Program Rules + Manual through a Final Decision dated November 29, 2023

More fully analyze / update Program every three years

Front-of-the-Meter Storage Development

In the Year 2 ESS Program Review, PURA investigated barriers to front-of-the-meter (FTM) storage deployment and directed the ESS Program Administrators to establish a FTM Working Group with industry stakeholders

FTM Working Group directed to develop:

- FTM tariff and incentive designs, including at least one wholesale distribution rate
- Estimates of FTM tariff costs
- Implementation timelines

Full FTM proposal will be filed with PURA by December 29, 2023

PURA will rule on FTM incentives and tariff design in a decision next year in Docket No. 23-08-05

FTM Storage Development (cont.): DEEP Procurements

Public Act 21-53 authorized the Connecticut Department of Energy and Environmental Protection (DEEP) to issue requests for proposals for energy storage projects connected at the transmission or distribution level, in combination with PURA-authorized programs, to meet statewide energy storage goal of 1,000 MW by 2030.

DEEP will release a draft RFP for public comment in the coming months to procure energy storage and meet the following policy objectives:

1. Displace fossil fuel generation, particularly in Environmental Justice communities, while maintaining reliability
2. Interconnect new large electrical loads such as electric fleet vehicle charging facilities
3. Support the integration of new intermittent renewable generation in areas of the grid that have known capacity constraints

CT Utilities and Energy Storage

Section 2 of Public Act 22-55 authorized CT's investor-owned utilities (Eversource and United Illuminating) to propose energy storage pilots "for the purpose of demonstrating and investigating how energy storage systems can improve resiliency of critical infrastructure and improve reliability of the electric distribution system."

- PURA Docket No. 22-06-05 was opened to review these pilot proposals
- PURA issued guidance on the pilot proposal submissions on September 14, 2022, including information on how reliability and resilience benefits and overall costs and benefits would be assessed
- United Illuminating and Eversource filed their pilot proposals in December 2022 as Motion Nos. 3 and 4, respectively
- A PURA Decision in Docket No. 22-06-05 is expected by the end of 2023

Section 1 of Public Act 22-55 amended the criteria under which Eversource and United Illuminating can own storage

PURA authorized a framework for Eversource and United Illuminating to evaluate storage against traditional "pole and wires" solutions for distribution system needs in the November 9, 2022 Decision in Docket No. 17-12-03RE07, called the Non-Wires Solutions Process (or NWS Process)

- Implementation of the NWS Process is currently ongoing through Docket No. 24-08-08
- The first year of the NWS Process will be 2025

Additional Information

Siting and Building Codes

- Energy storage siting is primarily overseen by the Connecticut Siting Council and local municipalities.
- CT's Department of Administrative Services (DAS) is working on updating the CT State Building Code to include regulations specific to energy storage.
  - DAS is also responsible for updating the CT State Fire Code.
- PURA directed the ESS Program Administrators to compile existing, publicly available resources regarding any applicable flood proofing, building code, safety, and siting requirements affecting residential and commercial ESS projects into a single educational resource.

Safety Standards

- To be eligible for ESS, energy storage systems must obtain the following UL certifications: (1) UL 1973; (2) UL 9540; and (3) UL 1741 SA.
- The Connecticut Green Bank conducts optional inspections of ESS projects using a checklist developed from the 2020 National Electric Code (NEC).

Interconnection Guidelines

- CT's interconnection requirements and guidelines contain provisions specific to energy storage.
- Energy storage developers submit (dis)charge limiting schedules with the interconnection application, so the utility's distribution impact study can consider real-world operating conditions.
- PURA recently directed the electric utilities to explore national energy storage interconnection practices, to determine if changes are warranted to CT's energy storage interconnection requirements.

Decommissioning and Recycling

- Section 8 of the ESS Program Manual requires an ESS project's contractor or third-party owner (TPO) to dispose of and recycle all project components in a manner that minimizes waste and environmental harm in compliance with all local, state, and federal regulations.
- The Connecticut Green Bank will lead a recycling working group to develop recommendations to resolve solar panel and battery recycling and waste.
  - The Green Bank will provide recommendations for PURA's review on August 1, 2024.

Implementation of FERC Order 2222

- ESS Program prohibits forward capacity market (FCM) participation, after consideration in last two ESS annual review dockets, due to negative RIM impacts.
- PURA and DEEP will continue monitoring how FERC Order 2222 could enable state programs to take advantage of new market revenues.

Storage Impact on Ratepayers

- Statutory objective to provide positive net present value to ratepayers.
- Green Bank conducts benefit-cost analysis of ESS Program, including Ratepayer Impact Measure (RIM) cost test.
- Target RIM of at least 1.4.
- Latest RIM result was 1.95 overall (1.93 residential, 1.97 commercial).

Requirements for Non-Utility DER Aggregators

- Beginning in 2024, ESS Program Administrators will allow aggregators to apply to the ESS Program.
- ESS aggregators must sign Scope of Work, including an integration plan, with the ESS Program's DERMS provider. Cannot use own DERMS.
- ESS aggregators/operators are responsible for receiving signals from the DERMS and relaying those signals to the BESS.
- ESS aggregators cannot currently participate in capacity markets.

Role of State in Storage Operational Strategy

- PURA sets requirements and schedules for passive and active dispatch.
- Active dispatch events are called by the utilities when the grid is under stress.