



Connecticut Department of Energy and Environmental Protection



Leading By Example: Improving Energy Management at Connecticut State Facilities

Office of Energy Demand
Bureau of Energy and Technology Policy

The logo features the word "Lead" in a large, blue, sans-serif font. The bottom portion of the letters "L", "e", "a", and "d" is filled with a green-to-blue gradient. Below "Lead" is the phrase "by Example" in a smaller, green, sans-serif font.

Lead
by Example



Agenda

1. Vision for Lead By Example
2. State Government Energy Usage Snapshot
3. LBE Accomplishments and Project Savings Highlights
4. Strategies Moving Forward
5. EnergyCAP Demonstration of Statewide Reports



Vision for Lead By Example



LBE Vision

Implement sustainable and predictable funding and financing

Empower all state agencies to analyze accurate and complete energy data

Set and achieve energy and water efficiency targets at state facilities

Convert 100% state street lights to LED by 2021

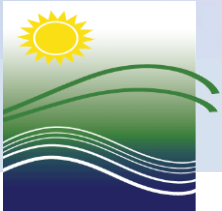
Update High Performance Building Standards Statutes & Regulations

Aggregate energy purchasing while meeting or exceeding the RPS

Assess feasibility of renewables at state facilities

Improve Electric Vehicle infrastructure at state facilities

Reconvene LBE Council of Commissioners (COC)



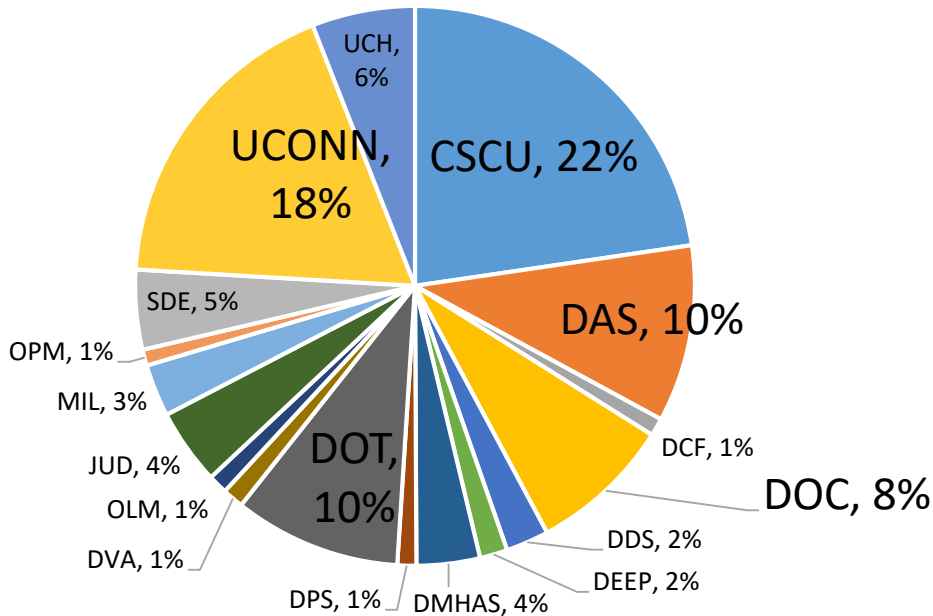
State Government Energy Usage Snapshot



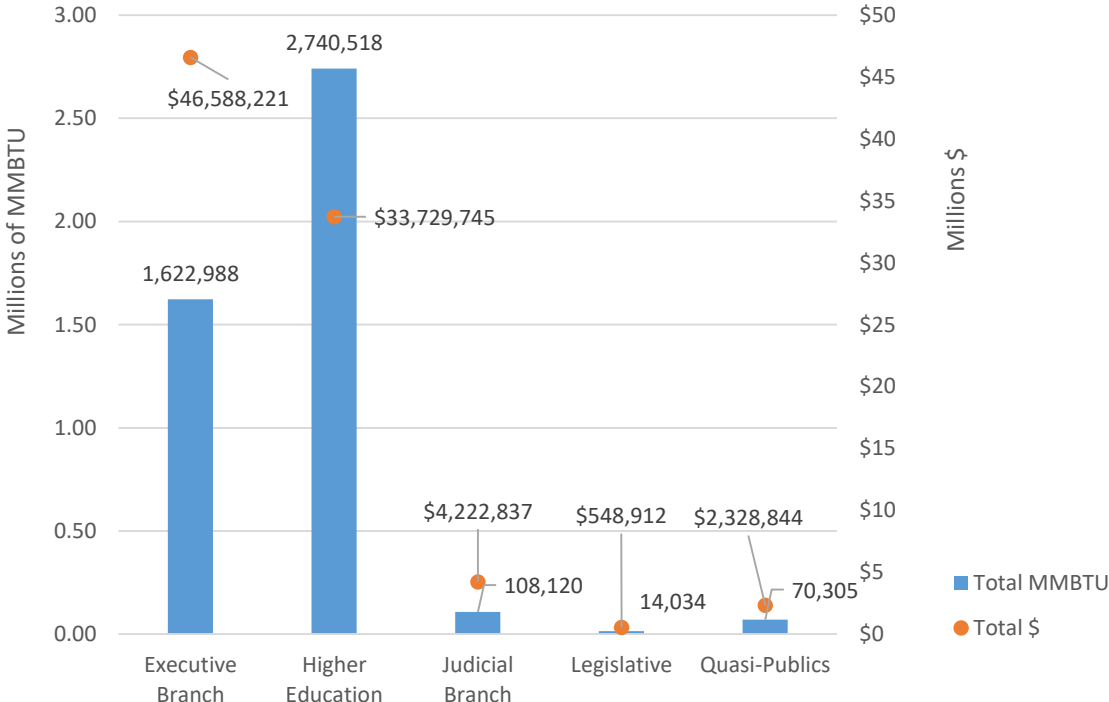
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State Building and Energy Overview

Gross Square Feet of Floor Space by Agency



FY18 State Est. Energy Cost & Use

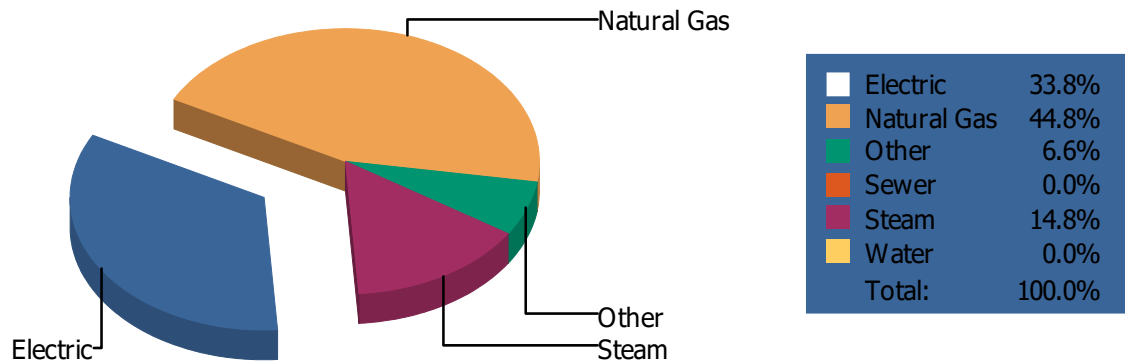


*Snapshot of the information currently available, the data is not 100% complete

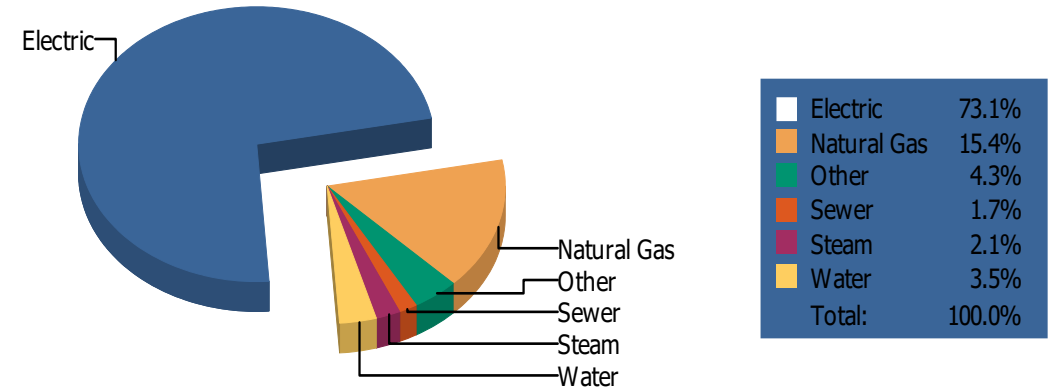


State Energy Use and Cost by Commodity

Use Percentage



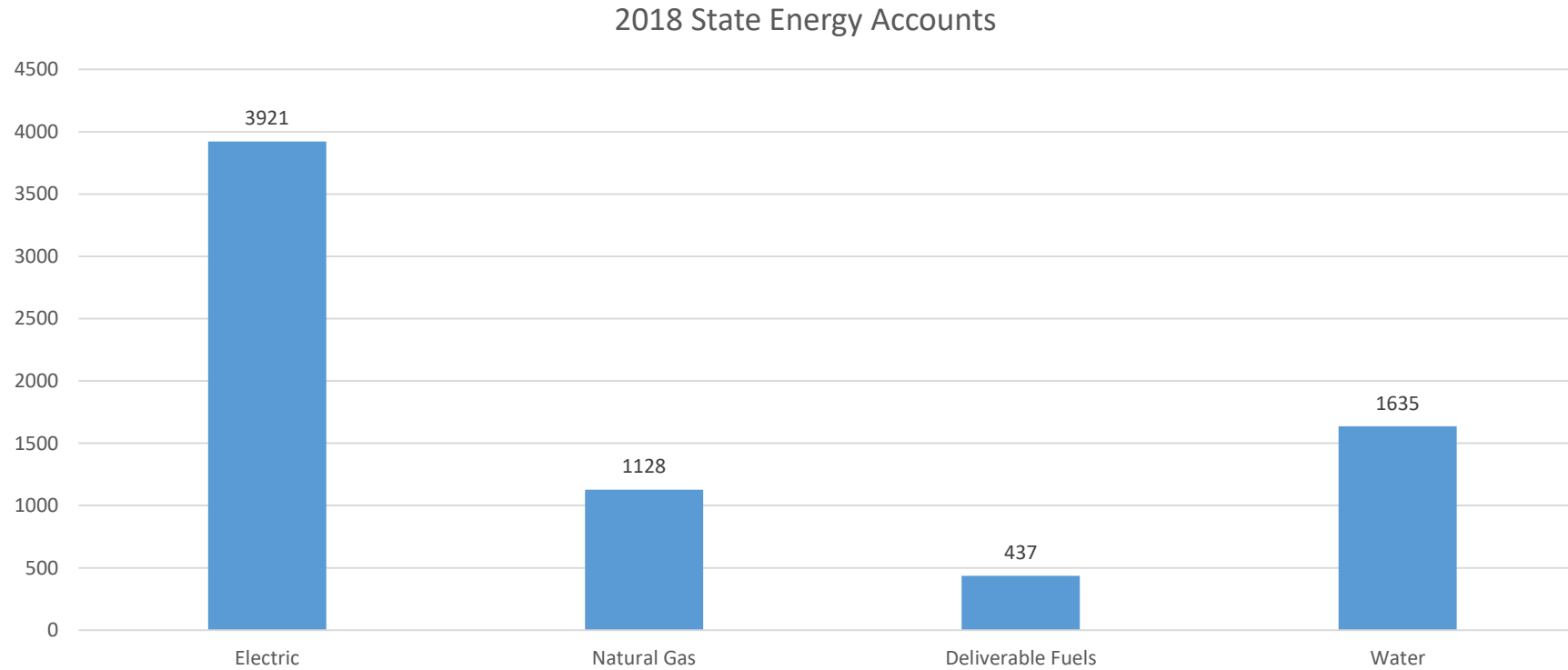
Cost Percentage



**Snapshot of the information currently available, the data is not 100% complete*



State Energy Accounts by Commodity



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LBE Accomplishments and Project Savings Highlights



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Why Lead By Example?

Connecticut's state buildings are an important energy savings opportunity

State buildings account for 15%-20% of electricity and natural gas consumption across the state, costing about \$100 million in energy costs for SFY18

Energy efficiency measures can reduce energy costs **up to 30%**

Since 2012, **energy efficiency investments** have resulted in

208+

energy saving projects

\$6.2M

annual state savings



LBE Accomplishments



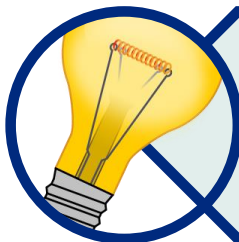
Achieved key progress in energy analytics
Established electronic data flow from some utilities to state platform for analyzing energy



Progress installing upgrades at CT Valley Hospital campus
Bond funding for major efficiency upgrades fully expended by end of 2016; additional funds in 2018
Multiple agencies successfully completed minor efficiency upgrades



Established master agreements with Connecticut's utilities to unlock the ability of state agencies to use utility administered programs to complete small-scale energy efficiency investments in facilities

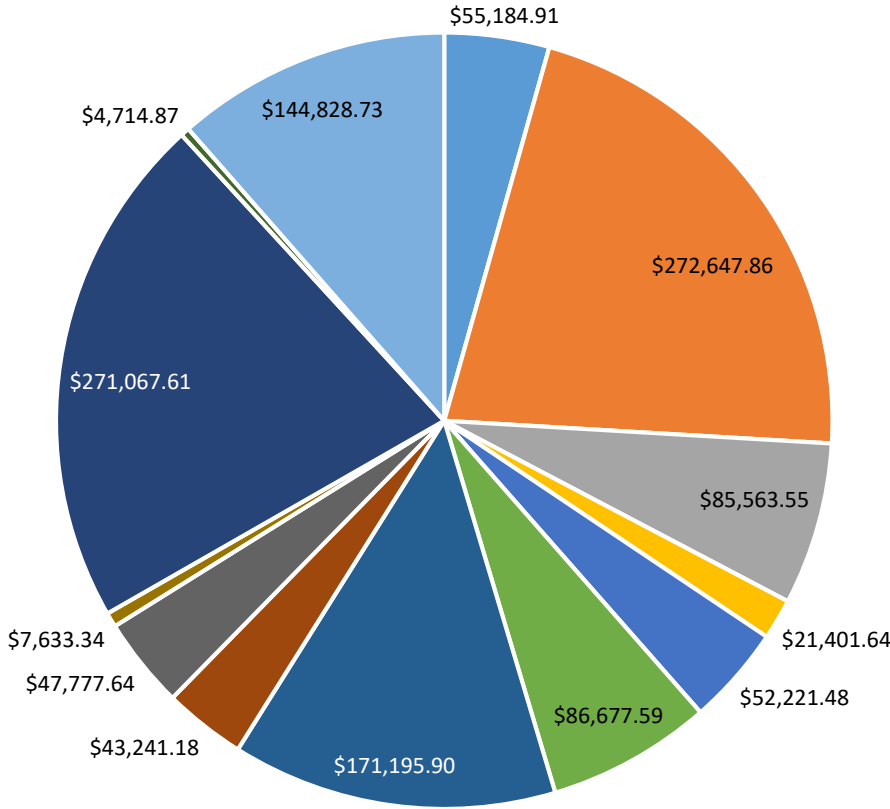


Purchased competitive electricity supply for all agencies at pricing below standard offer
8.423 cents per kWh compared to 10.14-11.23 cents/kWh



Utility Turnkey Projects Savings 2014-2018

Estimated Annual Cost Savings by Agency

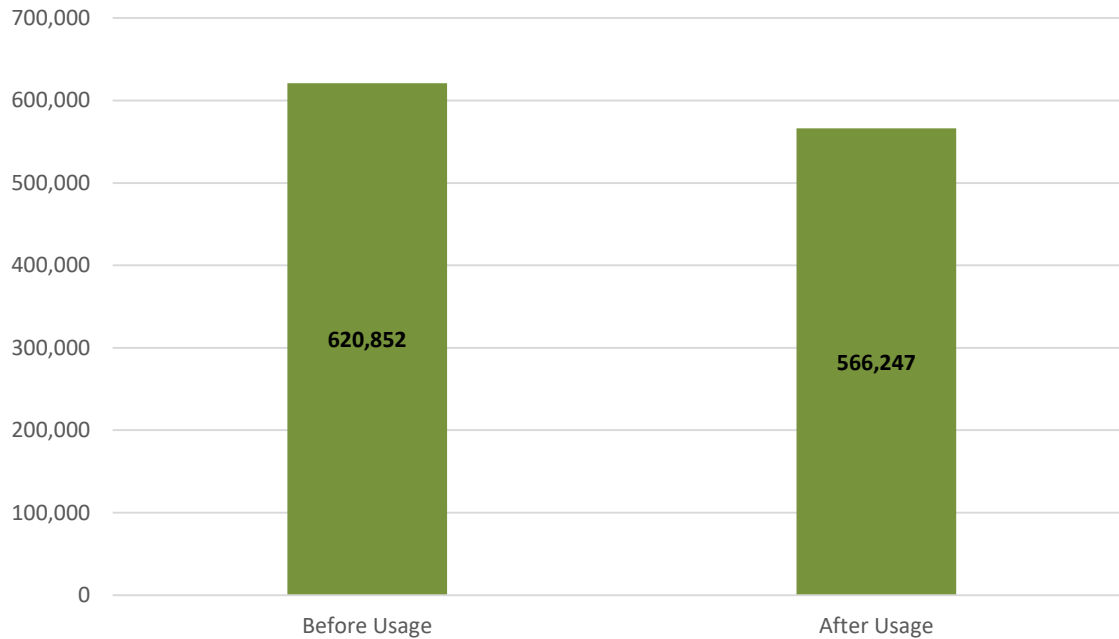


- Connecticut State Library
- Department of Administrative Services
- Department of Children & Families
- Division of Criminal Justice
- Department of Developmental Services
- Department of Energy and Environmental Protection
- Department of Emergency Services & Public Protection
- Department of Mental Health & Addiction Services
- Department of Correction
- Department of Labor
- Department of Transportation
- Judicial
- State Department of Education

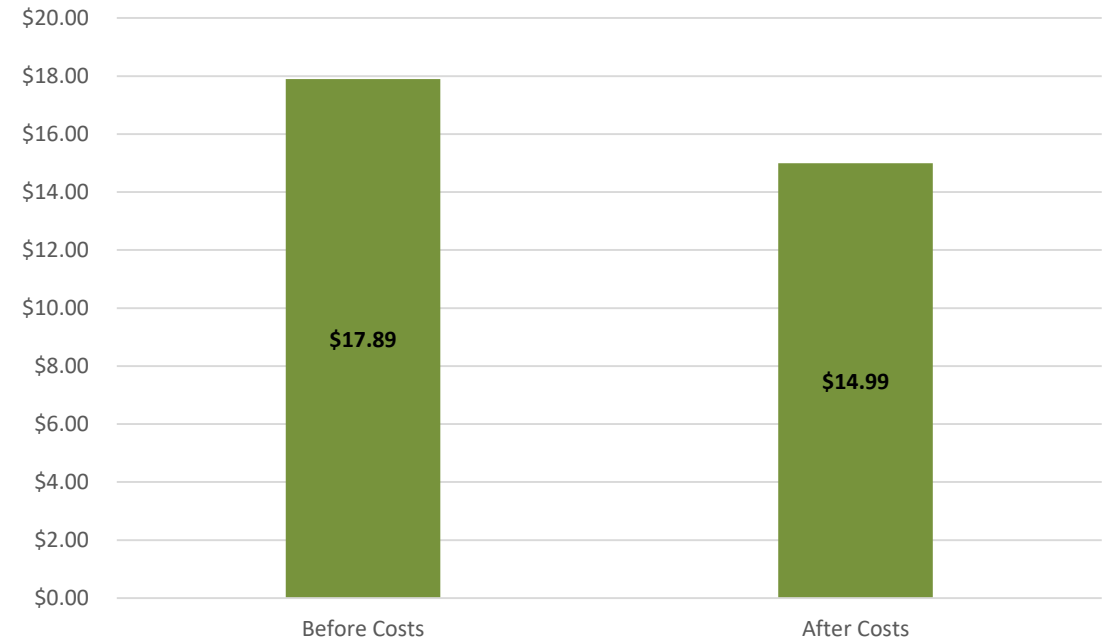


Completed Bond-Funded Projects - Savings 2012-2018

Energy Usage Before & After in MMBTU



Energy Costs Before & After in Millions



-These graphs are from the 46 completed projects with a year's worth of data

-These projects have saved \$2.9 million and 54,605 MMBtus in their first year

-\$841,775 in incentives for these projects was diverted from DEEP's LBE fund account to the General Fund in CY17 (this is in addition to the C&LM Plan funding diversion)



DEEP ENERGY EFFICIENCY PROJECT WITH DAS

IMPACT:

Following this project, DAS reduced annual energy use by over **3,450 MMBtus** resulting in estimated energy cost savings of **\$253,000 per year.**

by completing a mechanical renovation in 2015 at 55 Farmington in Hartford.

The project cost was \$609,550 with a payback period of 2.41 years.

Project Site at 55 Farmington Ave, Hartford, Photo from hartfordbusiness.com



DEEP ENERGY EFFICIENCY PROJECT WITH DOC

IMPACT:

Following this project, DOC reduced annual energy use by over **3,000 MMBtus** resulting in estimated energy cost savings of **\$143,000 per year.**

by replacing inefficient, outdated rooftop HVAC units in 2016 at their Robinson Correctional Center. **The project cost was \$275,381 with a payback period of 1.93 years.**

Satellite View of IL DOC - Robinson Correctional Center

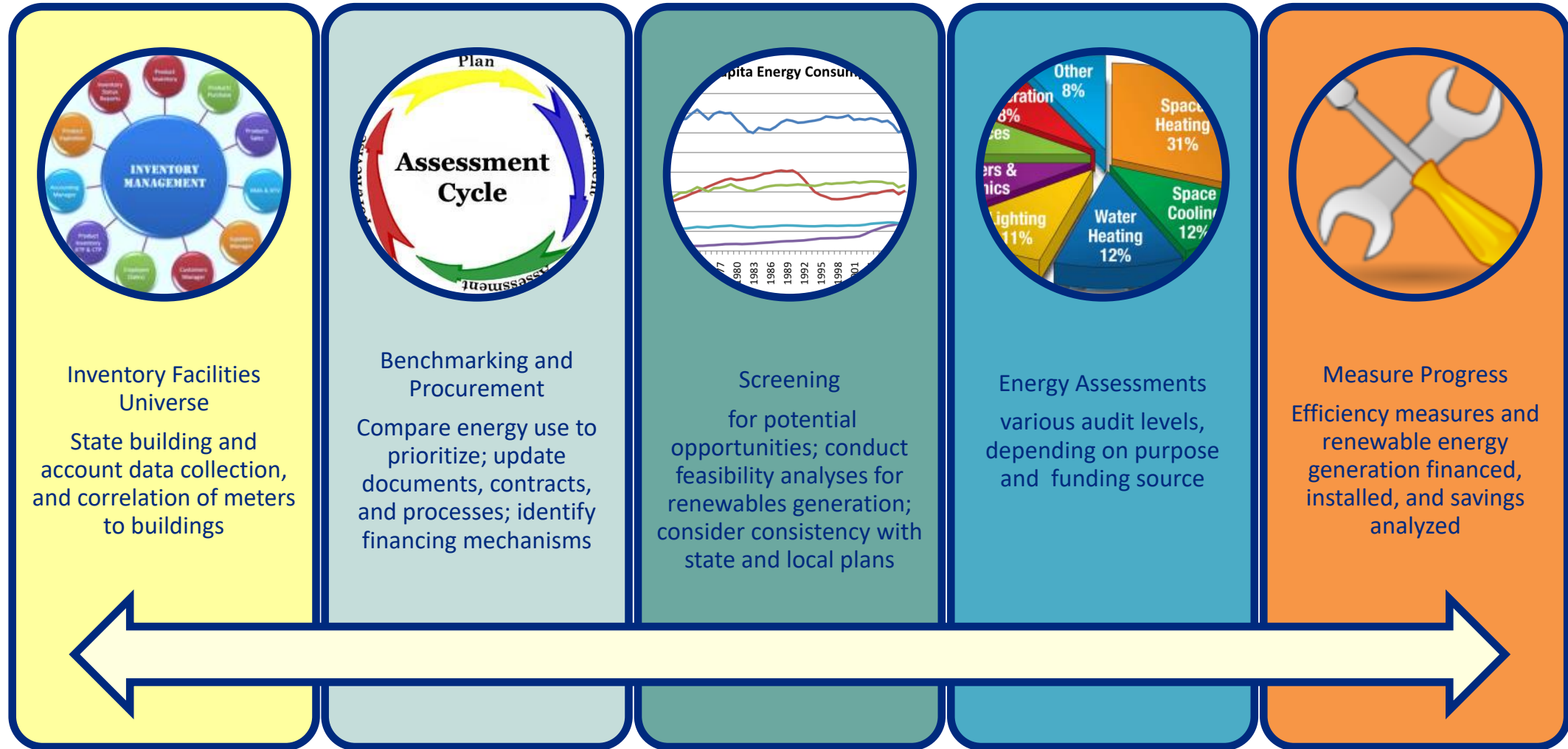


Projects and Strategies Moving Forward

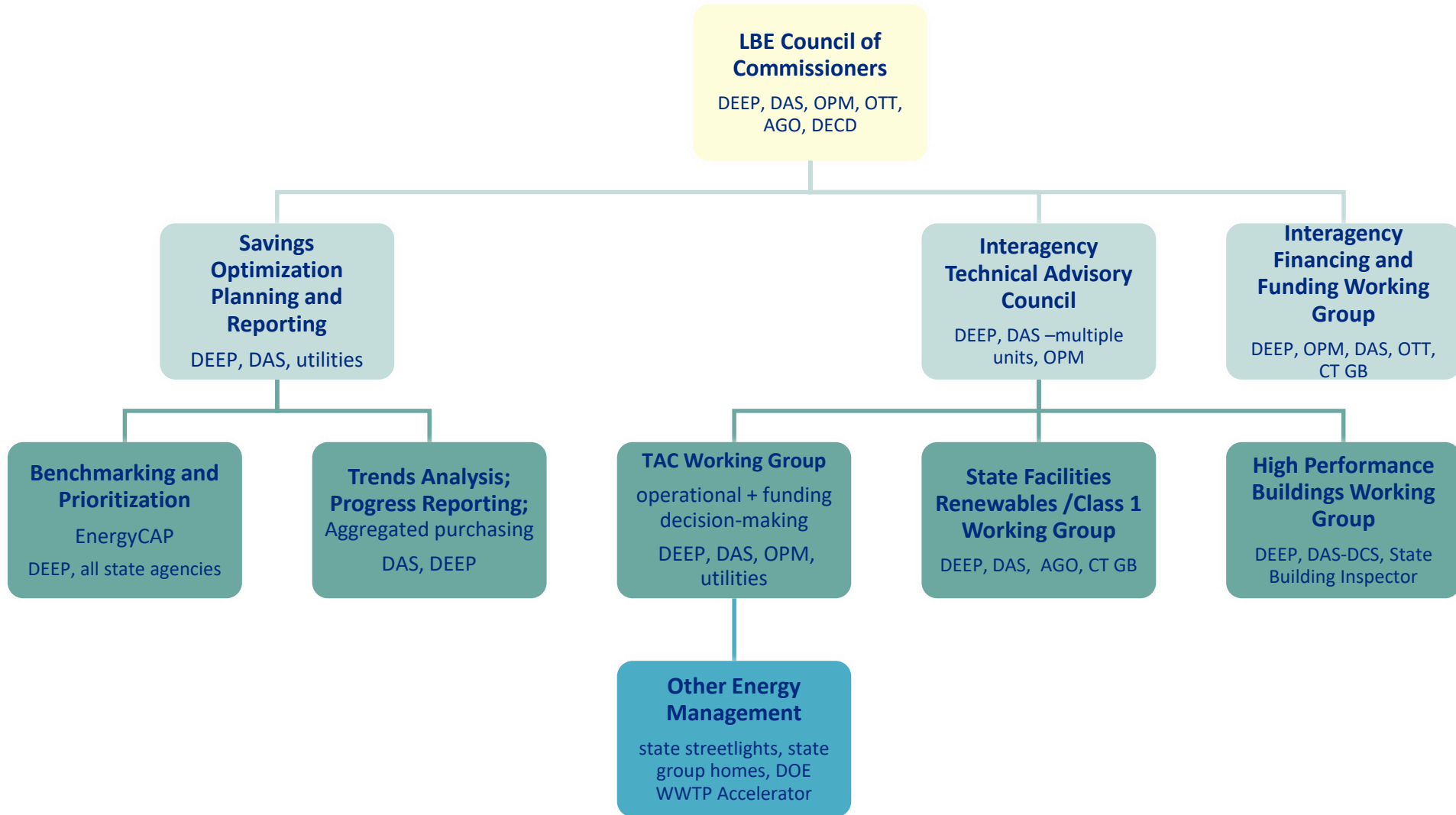


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Strategic Plan for Better State Buildings

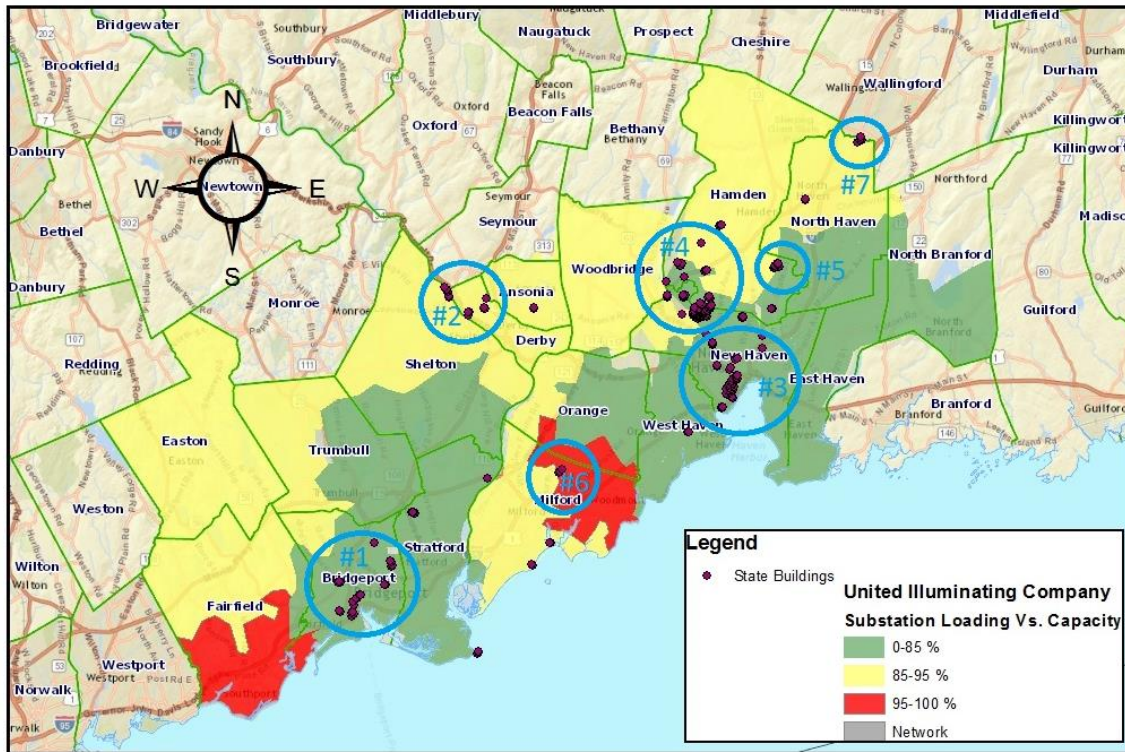


Reconvene Governor's Council of Commissioners



Geo-Targeting Renewables for State Facilities

State Properties within United Illuminating Company Service Area

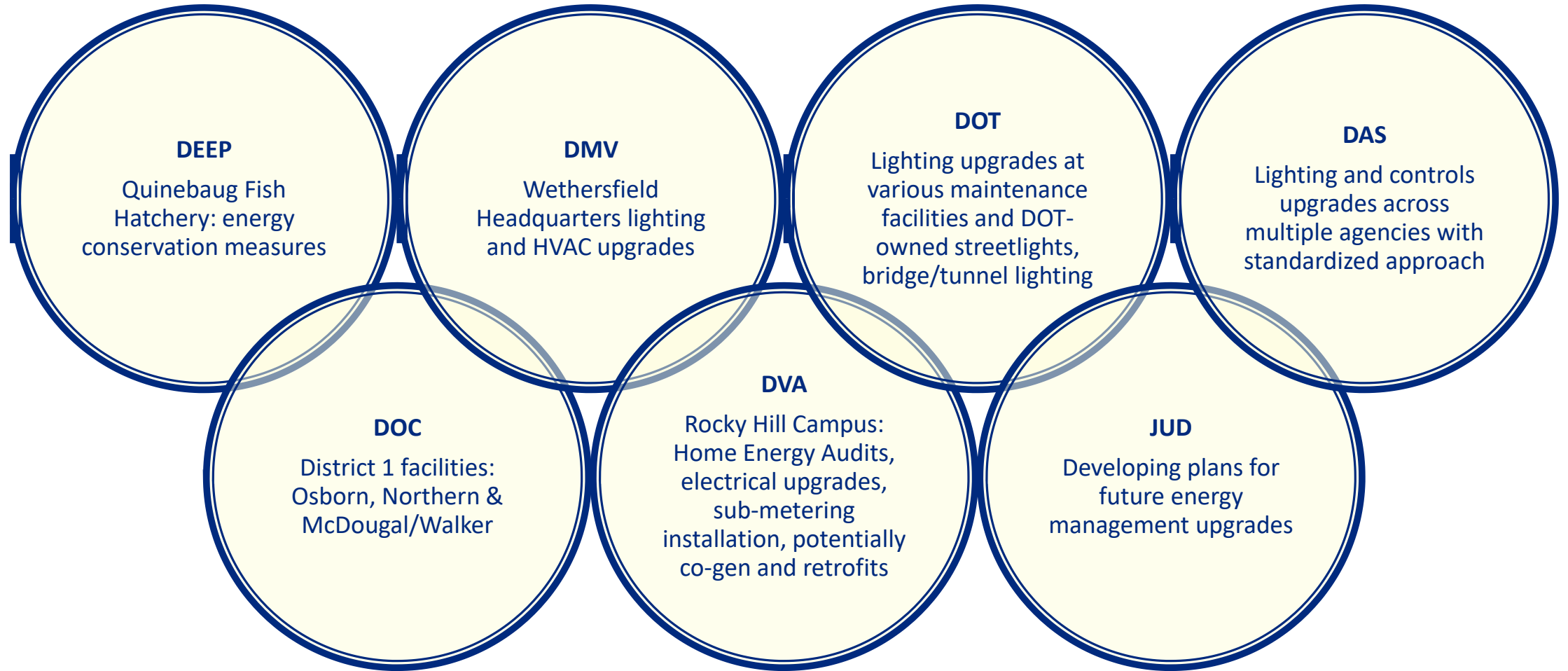


Strategically install renewable energy sources to integrate with existing energy infrastructure and address energy waste and efficiency first

- ✓ Ensure good siting decisions
- ✓ Maximize limited financial resources
- ✓ Ensure coordination with utilities on interconnection constraints and opportunities



Current and Future Energy Management Upgrade Projects



A Closer Look at Future Energy Management Upgrade Projects

Projects in the Pipeline

- 1** Department of Transportation will upgrade their highway lights with LEDs saving over \$50K annually
- 2** Multiple projects to be completed at DOC, DVA, DAS, and other agencies following release of previously authorized \$20M bond funding
- 3** DOC, DOT, and DEEP are pursuing renewable energy projects with solar site feasibility assessments scheduled for 2019



EnergyCAP Demo of Statewide Reports



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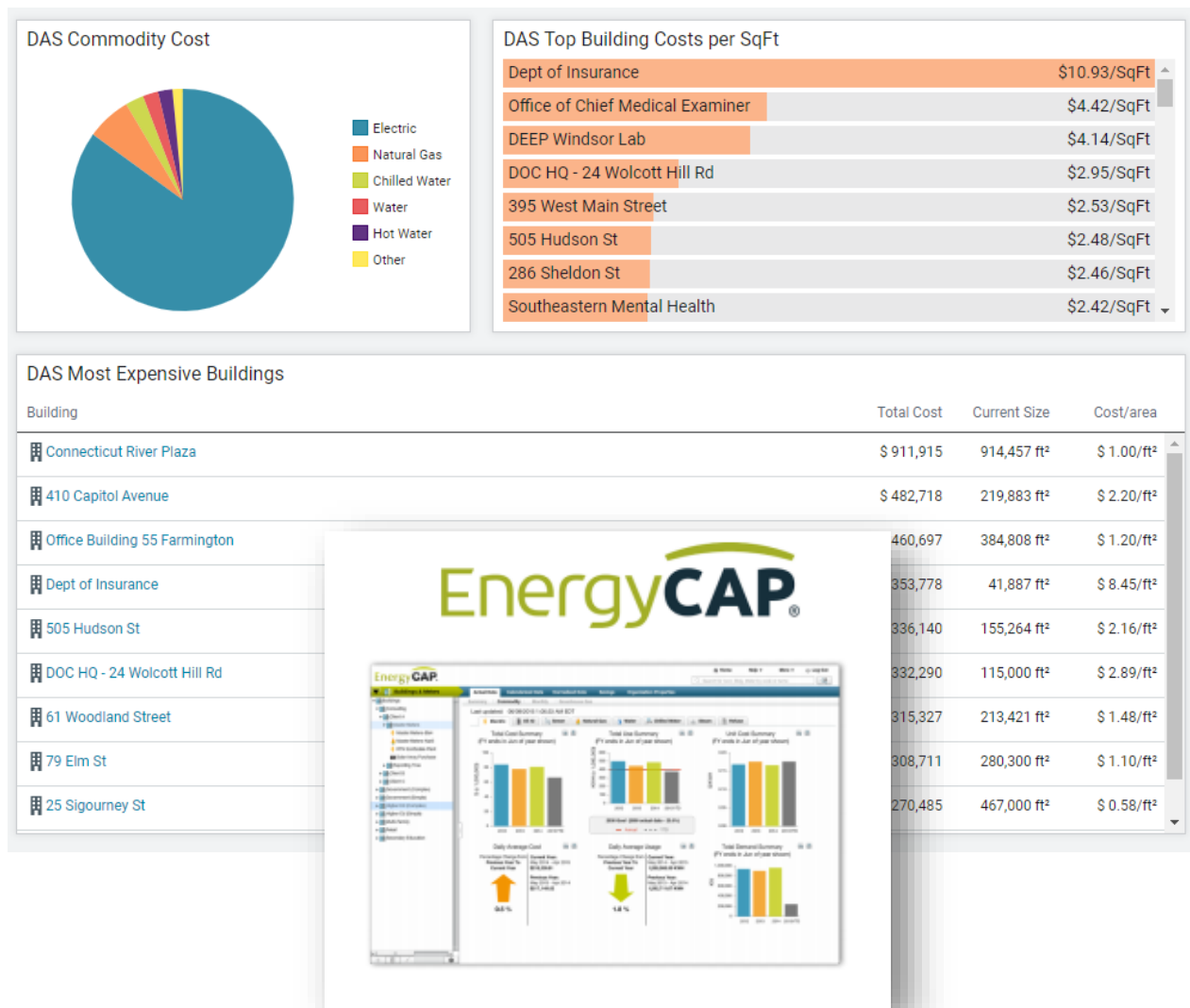
EnergyCAP at a Glance

Well suited for the state's comprehensive energy structure

- allows agencies to manage their state accounts, buildings, meters, and even sub-meters at a granular level

Can populate into Portfolio Manager, allowing agencies to view Energy Star Scores

Provides customizable live energy dashboards and powerful tools for energy use and cost analyses



Ranking DAS Buildings by Energy Use and Costs

DAS Top 10 Building Use Per Area: FY18

Dept of Insurance	0.298 MMBtu/SqFt
DEEP Windsor Lab	0.177 MMBtu/SqFt
38 Wolcott Hill Road	0.157 MMBtu/SqFt
Office of Chief Medical Examiner	0.119 MMBtu/SqFt
Highland House	0.085 MMBtu/SqFt
Gov.Res.Annex/Guest House	0.084 MMBtu/SqFt
DOC HQ - 24 Wolcott Hill Rd	0.071 MMBtu/SqFt
286 Sheldon St	0.066 MMBtu/SqFt
Garage #2 (14)	0.063 MMBtu/SqFt
Southeastern Mental Health	0.062 MMBtu/SqFt

DAS Top 10 Building Cost Per Area: FY18

Dept of Insurance	\$10.93/SqFt
Office of Chief Medical Examiner	\$4.42/SqFt
DEEP Windsor Lab	\$4.14/SqFt
DOC HQ - 24 Wolcott Hill Rd	\$2.95/SqFt
395 West Main Street	\$2.53/SqFt
505 Hudson St	\$2.48/SqFt
286 Sheldon St	\$2.46/SqFt
Southeastern Mental Health	\$2.42/SqFt
Gov.Res.Annex/Guest House	\$2.23/SqFt
Rowland State Government Center	\$1.80/SqFt

*Our EnergyCAP database-wide average EUI ranged between .108 and .114 MMBtu/SqFt in CY 2018

**Snapshot of the information currently available, the data is not 100% complete*



Top Energy and Water Use by State Agency

Top Energy Cost Per Area by Agency: FY18

Administrative Services, Dept. of	\$736.91/SqFt
Emerg. Svc. & Public Protection, Dept. of	\$452.72/SqFt
Energy & Env. Protection, Dept. of	\$243.61/SqFt
Military Dept.	\$130.97/SqFt
Developmental Services, Dept. of	\$98.29/SqFt
Mental Health & Addiction Svcs, Dept. of	\$86.14/SqFt
Correction, Dept. of	\$80.30/SqFt
Motor Vehicles, Dept. of	\$23.60/SqFt
Labor, Dept. of	\$22.31/SqFt
Children & Families, Dept. of	\$22.01/SqFt

Top Water Cost Per Area by Agency: FY18

Administrative Services, Dept. of	\$11.37/SqFt
Transportation, Dept. of	\$2.26/SqFt
Military Dept.	\$1.19/SqFt
Motor Vehicles, Dept. of	\$1.10/SqFt
Mental Health & Addiction Svcs, Dept. of	\$0.65/SqFt
Emerg. Svc. & Public Protection, Dept. of	\$0.42/SqFt
Correction, Dept. of	\$0.37/SqFt
Labor, Dept. of	\$0.09/SqFt
Education, State Dept. of	\$0.06/SqFt
Econ. & Comm. Develop., Dept. of	\$0.00/SqFt

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The End

LEAD BY EXAMPLE

FOR STATE GOVERNMENT

