

greenergovcT

2021 Progress Report

This report summarizes progress on the implementation of Connecticut's state sustainability initiative and meets the reporting requirements of Executive Order No. 1

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Background on EO 1

On April 24, 2019, Governor Lamont launched the GreenerGov CT initiative by signing Executive Order No. 1 (EO 1 or the Order) which directs Executive Branch agencies to advance environmental leadership and cost savings for taxpayers.

The Order calls on agencies to recommit to and expand the state's Lead by Example (LBE) program to reduce the operating costs and environmental impacts of state government facilities and operations. EO 1 builds on the foundation of the state's LBE program by setting new sustainability goals for Executive Branch agencies and invoking deeper levels of commitment and participation. The Order requires executive agencies to:

- Reduce greenhouse gas emissions by 45% below 2001 levels,
- Reduce waste disposal by 25% from a 2020 baseline,
- Reduce water consumption by 10% from a 2020 baseline, and
- Set additional sub-goals by 2030.

Reporting Requirements

This 2021 Progress Report satisfies the requirement in EO 1 to issue an annual "report on the progress in implementing this Order to the Governor and the chairpersons and ranking members of the Environment Committee and the Energy and Technology Committee of the General Assembly." It also covers the prior statutory requirement outlined in CGS §16a-37u.

All 29 Executive Branch designated agencies and 5 voluntary agencies submitted annual <u>Sustainability</u> <u>Performance Plans</u> detailing their progress on GreenerGov CT initiatives, barriers towards progress, and future planning.

For additional resources on sustainability initiatives in Connecticut state government visit: portal.ct.gov/GreenerGov. The GreenerGov CT site seeks to increase transparency of state actions to the public and facilitates easier sharing and collaboration with municipalities, organizations, businesses, and other states pursuing similar LBE programs.

Steering Commitee Members

Executive Order 1 established the Steering Committee on State Sustainability, co-chaired by the Secretary of the Office of Policy and Management (OPM), the Commissioner of the Department of Administrative Services (DAS), and the Commissioner of the Department of Energy and Environmental Protection (DEEP). The Steering Committee is composed of Senior Sustainability Officers from each Executive Branch agency, designated by their commissioners, who are responsible for leading their agency's efforts to comply with EO 1.

The following list includes the current Senior Sustainability Officers for Connecticut State agencies participating in EO 1.

Executive Branch Agency

Agriculture Experiment Station

CT State Library

Department of Mental Health and Addiction Services

Department of Administrative Services

Department of Aging and Disability Services

Department of Agriculture

Department of Banking

Department of Children and Families

Department of Consumer Protection

Department of Correction

Department of Developmental Services

Department of Economic & Community Development

Department of Energy & Environmental Protection

Department of Housing

Department of Insurance

Department of Labor

Department of Motor Vehicles

Department of Public Health

Department of Revenue Services

Department of Social Services

Department of Transportation

Department of Veterans Affairs

Division of Criminal Justice

Emergency Services & Public Protection

Military Department

Office of Early Childhood

Office of Policy & Management

Public Defender Services

State Department of Education

Voluntary Agency

Capital Region Development Authority Connecticut Housing Finance Authority

CT General Assembly

CT Green Bank

CT Innovations

CT Lottery

CT State Colleges & Universities

Judicial Branch

State Education Resource Center

UCONN

UCONN Health

Senior Sustainability Officer

Michael Last

Frank Calvi

Stephen DiPietro

Noel Petra

Michelle Provost

Nathan Wilson

Jacqueline Shirley

David Barry; John McCarthy

Jason Cohen

Steve Link, Chris Iwanik

Scott McWilliams

Susan Shellard

Dennis Thibodeau; Bob Girard

Miguel Rivera

Josh Hershman

Patrick Tallarita

Darrell Grant

Chukwuma Amechi

Theresa Peterson

Michael Gilbert

Suzanne Donlon; Robert Bell

Joseph Danao

Lieutenant Colonel John Eckersley

Peter Zelez

Michael Carragher

Chris Lyddy

Paul Hinsch

Jen Loo

Keith Norton



AGENCIES
PARTICIPATING IN EO 1



EXECUTIVE BRANCH
AGENCIES DIRECTED TO
PARTICIPATE

Senior Sustainability Officer

Joseph Geremia Maura Martin Eric Connery

Eric Shrago

Cynthia Petruzello

Barbara Petano

Keith Epstein

Elizabeth Graham

Van Kolton

Michael Jednak; Rich Miller

Thomas Trutter



VOLUNTARY STATE
AGENCY PARTICIPANTS

Key Achievements

Despite the setbacks of navigating the COVID-19 pandemic, the GreenerGovCT initiative and Connecticut's public agencies achieved several successes that saved energy, water, and money; and created a foundation for future project deployment, including:



- Achieved 95+% complete data collection for all electric, water, and fuel commodities used in FY19 and FY20, expedited by the state's use of the utility tracking software, EnergyCAP.
- Benchmarked 30% of the Executive, Judicial, and Legislative state buildings over 5,000 square feet via EPA Portfolio Manager to measure the energy efficiency of Connecticut state buildings compared to national averages.



 Initiated 93 projects, policy changes, and sustainability initiatives in Executive Branch agencies, which reported 56 sustainability projects, and in voluntary agencies, which reported 37 sustainability projects in the FY20 Sustainability Performance Plans.



- Conducted 24 energy audits on priority state buildings representing 13% of total Executive Branch square footage.
- Continued energy retrofit improvements at the Northern Region
 Department of Correction facilities using \$12 million allocated in LBE bond funds at the end of 2019 to support this work.
- Standardized new <u>programmatic protocols</u> to successfully leverage utility incentives and on-bill financing programs at scale.
- Promoted <u>building re-tuning and optimization strategies</u> for spaces that are partially occupied by state agencies.



RENEWABLES

- Finalized the Power Purchase Agreement master contract.
- Secured zero emission renewable energy credit (ZREC) contracts for pilot projects at a dozen state facilities. Once constructed, these pilot sites will host over 1100 kWdc of new solar capacity.



- Installed GPS telematics hardware on over 50% of the state fleet to help identify operational fuel savings and candidates for vehicle transition to electric vehicles (EVs).
- In partnership with Greater Bridgeport Transit, the Department of Transportation deployed two forty-foot Proterra battery electric buses and completed the installation of the associated charging infrastructure, projecting annual fuel cost savings of \$22,000, or 38%, and annual maintenance cost reductions of approximately 30%.



MATERIALS MANAGEMENT

- Gathered data to use as a proxy basis to estimate the quantity of waste generation across the Executive Branch. Once complete, this will serve as a "baseline" for goal tracking.
- Secured EPA grant funding to support technical assistance for food scrap collection at priority sites continuing to operate food service during the pandemic.



- Collected data from all water utilities and wells, including data retrieved for the first time at DEEP's three state fish hatcheries and Department of Correction properties. These well water sites, previously untracked, comprise 75% of the state's water usage.
- Promoted water conservation messages aligning with Interagency Drought Workgroup recommendations in response to the 2020-2021 declared drought
- Ran a successful Fix-a-Leak Week, repairing 64 leaks to save an estimated 405 gallons of water each day.

Navigating COVID-19

The emergence of the global COVID-19 pandemic and its impact on public health significantly impacted agency operations and progress towards EO1 goals.

60.2%

of the state workforce transitioned into full-time telework arrangements.

This shift impacted agencies in several ways.



 Postponed Contract Updates - Our goal was to conduct waste disposal surveys and waste disposal data collection efforts by July 1, 2020. Waste data collection and updates to state waste hauling contracts were postponed due to the pandemic.



- Building Energy Use Declined When comparing the quarter between March and July in 2019 and 2020 (CQ19 and CQ20) executive branch electricity use declined 7.5% and executive branch natural gas use increased 13.5% between baseline CQ19 and CQ20. However, with only a portion of our state workforce working from state-owned assets, a subset of our typical emission portfolio was offset to employee homes.
- Accelerated Building Divestment the state divested 463,000 square feet of property in 2020.
- Reduced State Fleet Use From January 2020 to April 2020, gallons of fuel used by the state fleet dropped from 151,000 in January 2020 to 53,000 in April 2020. Similarly, miles driven dropped from 2.64 million in January 2020 to 0.944 million in April 2020.



Reduced Employee Commuting - While not a formal element of EO 1
goals, emissions from employee commuting decreased 60% resulting in
over 240 metric tons of CO2 equivalent avoided in reduced GHG
emissions from Executive Branch employees per day from baseline
levels as of August 2020.



Attendance at Connecticut state parks and recreational facilities flourished in 2020, providing a welcome respite from pandemic stress. However, DEEP faced increased costs associated with the direct trash removal and staff time to do so, totaling at least \$1 million dollars over the year.

Going forward, DEEP will be developing more targeted messaging to "Carry in , Carry Out" and improve signage and infrastructure collection to help reduce the amount of trash generated in the parks, save on staff/operational costs, and maintain the quality of the park experience for generations to come.

Looking ahead, agencies indicated that some of these pandemic-related shifts held potential for future "normal" operations, including:

- Holding virtual meetings as a more regular practice,
- · Reassessing agency fleet,
- Strategically evaluating the building footprint needed to do agency work,
- Increased telework as a regular practice,
- Providing more virtual/digital agency services to the public,
- · Hands-free sensors installed on toilets for public health and smarter water use, and
- Increased use of technology to reduce paper processes.

"Education has been key. While in our previous offices, we tried to institute a central "garbage area" with no refuse at individual desks, and it was met with resistance. At our new offices, everyone appears to be amenable to the idea. Because of COVID, the staff are more open to changes within the office."

Connecticut Innovations



Energy Audits at Priority State Buildings

Location

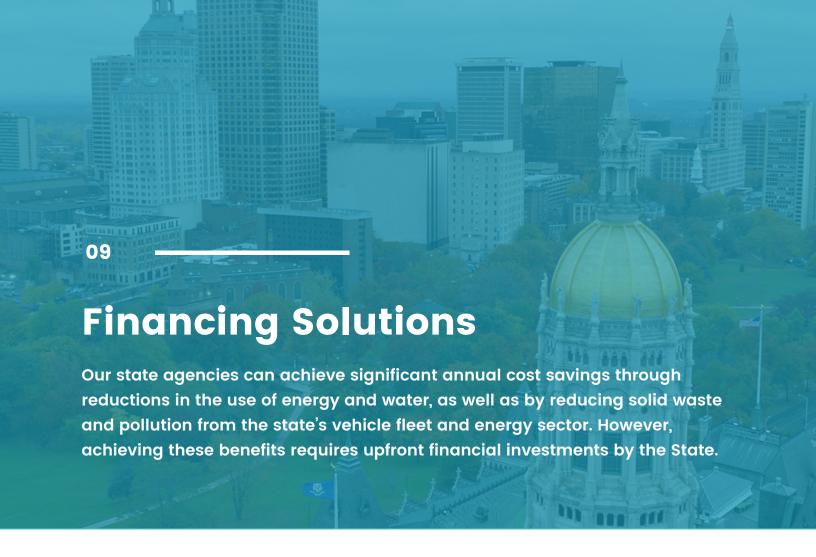
Agency

As selected by the Co-Chairing agencies, 24 priority buildings received comprehensive Level 2 ASHRAE Energy Audits. These 24 buildings were selected based on their large size (each over 50,000 square feet), high energy use or outdated equipment, and alignment with the state facilities plan and broader capital investment goals. Collectively, these facilities represent 3,867,574 square feet, or about 13% of the total square feet in the state building stock. These audits were conducted by five consulting firms (Colliers, Van Zelm, Gale, WSP, and CES) and funded through general obligation bonds authorized under the Lead By Example program with additional incentives provided by Eversource and UI.

The audits identified \$40 million worth of energy and water improvement projects. The implementation of all of the recommended measures is projected to produce \$2 million in annual savings to the state's energy and water costs, and reduce GHG emissions 2.5% below our FY19 levels. Given the current funding authorization of \$28 million for the Lead by Example program, the Technical Advisory Committee comprised of the GreenerGov CT Co-Chair agencies is prioritizing those projects with the best balance of GHG reduction and financial payback.

Building

	ОРМ	East Hartford	Pratt & Whitney Stadium at Rentschler Field
	ESPP	Meriden	Forensic Lab
	ESPP	Middletown	DPS HQ
	DCF	Middletown	Building 8
40	DCF	East Windsor	Education and Recreation State Receiving Home
	MHA	Hartford	CRMHC
O	MHA	New Haven	CT Mental Health Center
•	MHA	Norwich	Southeastern Mental Health Authority Building
	DAS	Waterbury	Rowland Govt Center
ilitie	DAS	Hartford	450-460 Capitol Ave
4 1	DAS	Hartford	410 Capitol Ave
U	DAS	Norwich	Campbell Medical Building
5	DAS	Hartford	505 Hudson St
	DOC	Cheshire	Cheshire Cl
_	DOC	Hartford	Hartford CC
77	DOC	Cheshire	H.E.T. Building
	DOC	Enfield	Willard Cl
U	DOC	Newtown	Garner CC
_	DOC	Cheshire	Webster CI
	DOC	Uncasville	RL Corrigan
O	DOC	Brooklyn	Brooklyn CC 300 bed facility
5	DOC	Bridgeport	New Center & Memorial Unit
Audited	DOC	Enfield	Robinson
	DOC	Enfield	Enfield CC



General Obligation Bond Funding

Since 2012, Connecticut has used bond funding under the LBE program to complete over 72 projects that cumulatively save \$5.2 million in annual utility costs and 113,991 MMBTUs energy. An additional 29 projects are underway, projected to save \$3.1M in annual utility costs and 16M kilowatt hours, or 492K MMBTUs. Currently, the state has \$28 million in remaining bond fund authorization to implement energy efficiency projects. To meet the EO 1 goals, the Governor and OPM will be seeking new authorization for G.O. bond funding for projects, as well as reserving debt issuance to utilize tax exempt lease products.

EnergizeCT Programs and On-Bill Financing

With funding supported by a charge on customer energy bills, EnergizeCT offers several energy-savings programs for the state to take advantage of. This suite of programs includes the SBEA program which offers a financial platform that combines incentives for relevant energy efficiency measures with a zero-percent financing option to cover the balance of the energy efficiency project costs. Since 2014, the state has implemented 184 projects annually saving \$2.1 million in utility costs by reducing 12,739,522 kWhs and 20,264 CCF natural gas. Project uptake slowed in 2020 due to COVID-19 and the process of renewing the statewide Master Agreement. However, the maximum project cost was increased from \$100,000 to \$1 million, allowing agencies to take advantage of more comprehensive solutions.

Project Highlights

A key focus of GreenerGov CT is to make energy and cost saving sustainability practices part of "business as usual" across state facilities and operations.

Over 93 projects, policy changes and initiatives (56 in the Executive Branch, 37 in voluntary agencies) were started, most of which were completed by the end of 2020. These demonstrate the breadth and depth of actions agencies are taking to integrate sustainability into their operations.

Total Project Savings

Executive Branch Agencies



GHG Reduction 10,236 (metric tons)



Dollar Savings \$1,740,486.98

Savings quantified on estimates shared in agency FY20 Sustainability Performance Plans.



Reducing State Vehicle Fuel Use

DHMAS installed six dual-head electric vehicle charging stations at the Connecticut Valley Hospital (CVH) campus for employee parking, connected to a 9 kW solar array that provides carbon-free electricity to charge vehicles during the day and send electricity back into the CVH campus when not in use. The employee electric vehicle charging netted the equivalent of 4,064.77 gallons of gasoline.

New Solar Sites

CSCU installed solar onsite at two community colleges—one configured in a parking garage canopy and one as a parking lot canopy—and a fuel cell that will be operational later in 2021.

The parking garage solar canopy at Housatonic Community College is projected to generate 1,200 MWhs/year and to save the college \$93,000 per year in utility costs. The parking lot solar canopy at Asnuntuck Community College is expected to save \$28,000 annually in utility costs. Finally, the fuel cell at Eastern Connecticut State University will generate 9,800 MWhs/year and save the college \$430,000 annually in utility costs.





Expanding Nature-Based, Efficient Infrastructure

DOT Maintenance added 18 conservation areas in 2020, adding to a total of now 80 areas statewide comprising approximately 150 acres. The reduced mowing results in reduced fuel use and reduced GHG emissions; reduced labor costs and equipment maintenance; germination of the wildflower seed bank; and increased pollinator habitat.

Switching to LEDs

Across UConn campuses, a total of 63 lighting projects were completed in FY 2020 as part of UConn's goal to convert all campuses to LED. Most of these projects included the installation of lighting controls such as occupancy sensors. Projects were completed by either in-house UConn Trade Shops or outside contractors managed by UConn's Energy Conservation Group. The completion of the lighting projects will result in annual energy consumption savings of approximately 2.7 million kWh and over \$288,000 in annual energy avoided costs. These projects will also result in more than 1,500 metric tons of greenhouse gas reductions.



The Judicial Branch converted parking lot light poles and exterior wall pack High Pressure Sodium Bulbs to LEDs. This LED replacement project is projected to save approximately 9,589 kWh annually, reducing GHGs by 6.8 tons and saving a total of \$1,632.98 over the year.



Upgrading Building Heating and Cooling Systems

DMHAS replaced HVAC equipment throughout the Bridgeport facility and implemented improved controls. At CVH, failing steam piping was replaced to reduce the amount of steam loss to several buildings, thus reducing natural gas expenses and water usage. The Bridgeport facility is estimated to save \$100K in energy costs per year, while the steam pipe upgrades at CVH are estimated to save 476,808 CCF annually, resulting in \$282,652 annual fuel costs and \$59,069 in annual O&M savings

Creating an Internal Sustainability Team

CHFA is creating an internal Sustainability
Committee to begin planning and implementing waste and energy reduction efforts at the agency. Following up on efforts started in 2019, all newspaper subscriptions were changed from hard copy to online subscriptions. Making subscriptions online reduces paper waste and recycling, particularly during times of limited inoffice usage.



DOT installed hybrid waterless urinals and water conserving faucets at 7 rest areas. Over the course of a year, these new fixtures are projected to save 892,096 gallons of water compared to prior years.



Reducing, Re-Using, Recycling

CT Lottery Corporation produced a recycling awareness event and monthly rollout of reminders, staff-led bottle/can redemption, and refurbishment of old ticket dispensers to put back into use versus throwing away and replacing. All bottles/cans are returned for deposits and the money contributed goes to the CT Council on Problem Gambling, totaling \$500 since implementation. In the first 9 months, CT Lottery realized \$33,421 in cost savings for dispensers that were re-distributed to the field.

Data Dashboard

The data below summarizes the utility use and expenditures data for FY19 and FY20 for Executive Branch agencies. The data was pulled from the state's utility tracking system, EnergyCAP, on May 14, 2021, with the exception of the waste disposal data, which was pulled from Core-CT, the state's human resource management and financials system. The data below may be incomplete and will be updated once data collection has been completed.

UTILITY USE AND COST, FY19-FY20

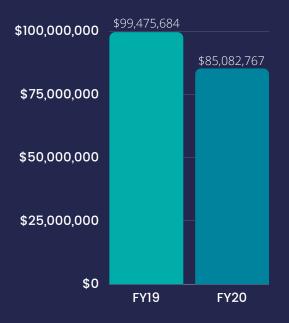
Executive Branch Agencies

Executive Branch v	56116163	Use			Cost		
	FY19	FY20	Unit	Change	FY19	FY20	Change
Electric	279,657,738	264,416,627	kWh	-5%	\$44,960,538	\$40,606,799	-10%
Natural Gas	12,026,633	11,494,785	CCF	-4%	\$10,994,136	\$9,546,109	-13%
Other Building Energy	409,335	248,138	MMBtu	-39%	\$5,021,564	\$4,084,963	-19%
Vehicle Diesel	1,856,662	1,548,329	Gal	-17%	\$5,904,185	\$4,583,054	-22%
Vehicle Gasoline	4,411,549	4,059,962	Gal	-8%	\$11,337,681	\$9,622,111	-15%
Total GHG Emissions	224,701	199,164	mtCO2e	-11%			
Water & Sewer	6,165,880	3,381,006	Kgal	-45%	\$11,903,059	\$9,929,818	-17%
Waste Disposal					\$9,354,523	\$6,709,914	-28%
Total					\$99,475,684	\$85,082,767	-14%

^{*}Gasoline and diesel costs estimated based on average weekly cost from EIA.gov, \$2.37 for gasoline and \$2.96 for diesel in FY20 and \$2.57 for gasoline and \$3.18 for diesel in FY19.

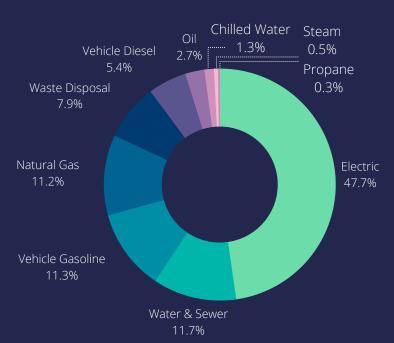
UTILITY EXPENDITURES

Executive Branch Agencies, FY19-FY20



UTILITY EXPENDITURES BY COMMODITY

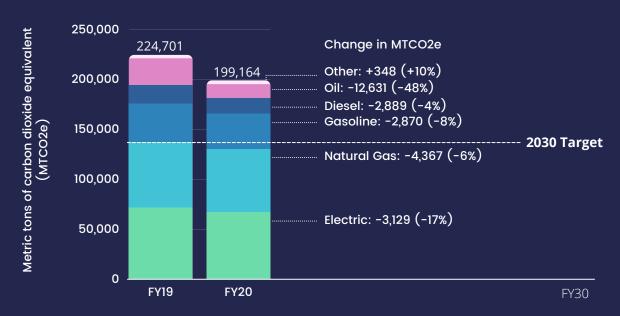
Executive Branch Agencies, FY20



^{**}Other Building Energy sources include oil, propane, steam, and chilled water.

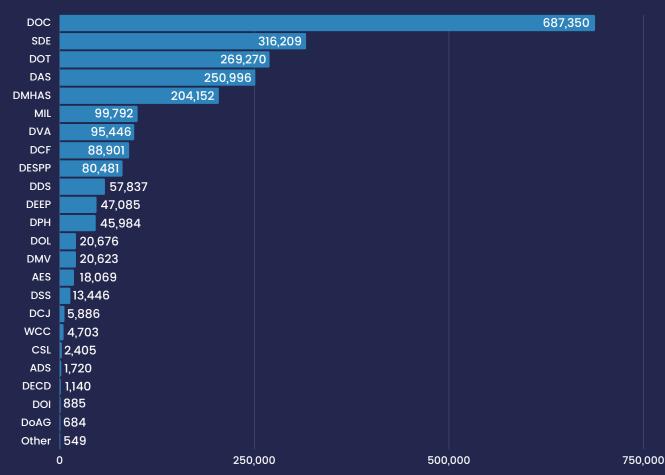
GHG EMISSIONS BY SOURCE (MTCO2E), FY19-FY20

Executive Branch Agencies



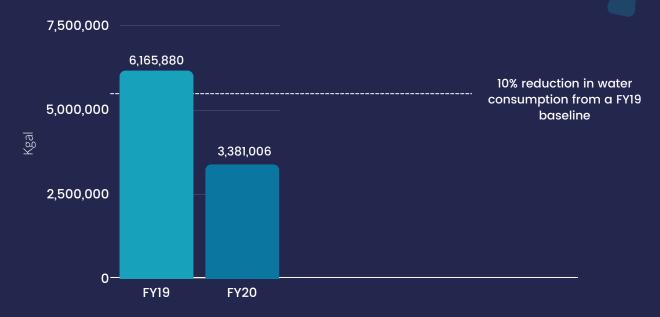
BUILDING ENERGY USE BY AGENCY (MMBTU), FY20

Executive Branch Agencies



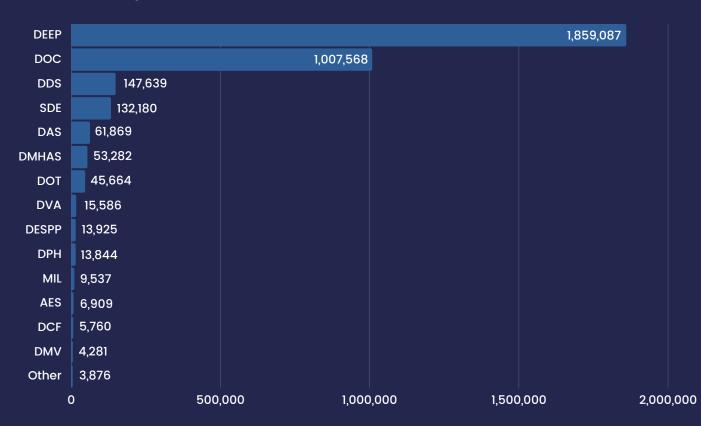


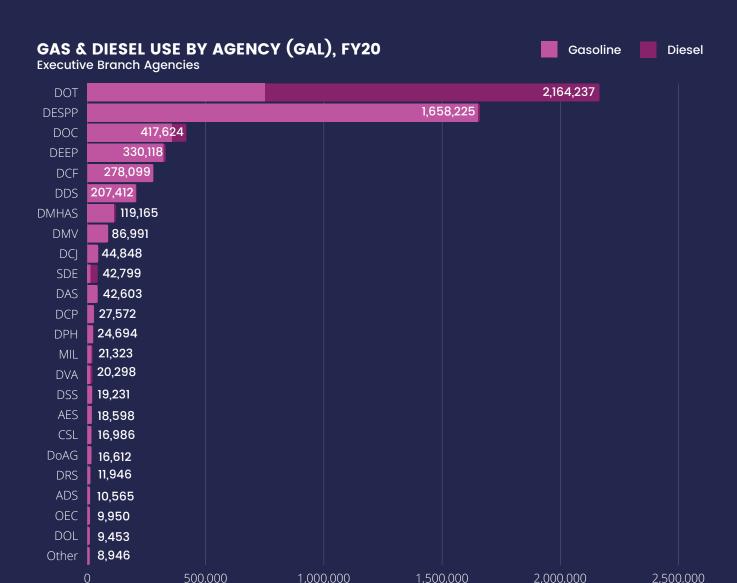
Executive Branch Agencies



WATER/SEWER USE BY AGENCY (KGAL), FY20

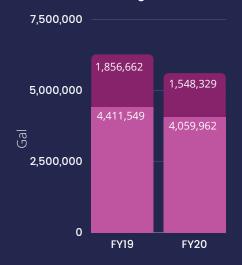
Executive Branch Agencies

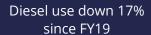






Executive Branch Agencies

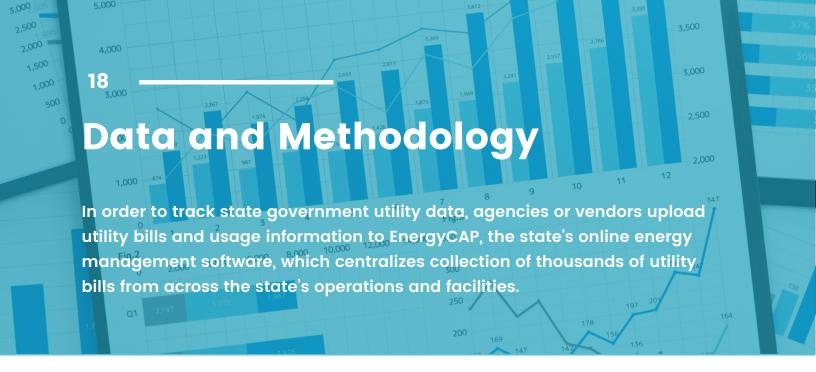






Gasoline use down 8% since FY19





EnergyCAP and Electric Emissions

Emission factors, or co-efficients, are used to calculate the environmental impact of operations and activities. GreenerGov CT currently uses the EnergyCAP GHG tracking module, which complies with the Intergovernmental Panel on Climate Change (IPCC) requirements to track the emissions from greenhouse gases relating to human activity. This year, GreenerGov CT updated its emission factors to reflect a market-based methodology that reflects the renewable energy certificates (RECs) associated with Connecticut's statewide policies, procurement decisions, and power imports/exports. Updating these factors resulted in an increase in the calculated emissions for the State, which increased by roughly 7.1% compared to previous estimates. This increase reflects the predominance of RECs that are not "zero emissions" at the point of generation.

Translating the GHG Reduction Goal

Although EO 1 calls for a 45% reduction in GHG emissions by 2030 compared to a 2001 (or 2014) baseline, state government activity data was unavailable from either target baseline. Instead, GreenerGov CT calculated the 2030 GHG reduction goal as a percentage change from a FY19 baseline, the earliest available data. Using the 2018 statewide annual GHG inventory as a reasonable proxy for FY19, the GreenerGov CT 2030 GHG reduction target is 32.53% below FY19 baseline GHG emissions.

Developing the Waste Disposal Baseline

EO 1 calls for a 25% reduction in waste disposed by 2030 based on a 2019 baseline. However, the majority of state facilities do not report or bill based on disposal weight or volume. GreenerGov CT conducted a comprehensive waste survey for 2019 to identify facilities with trash compactors that do record weigh/volume and developed a trash-per-capita proxy by building type that could be used to estimate total trash disposed across the Executive branch in FY19. To improve data collection and waste management, disposal fees and tonnage reporting standards should be included in the new waste contract, with haulers required to conduct container fullness and contamination audits at determined intervals to assist agencies in right-sizing containers and diversion efforts.



Building Decarbonization Opportunities

Overseeing the implementation of 13 high-priority, bond funded energy and water efficiency projects projected to annually save \$1.67M in utility costs, 751 million gallons of water, 6.6M kWhs of electricity, 59,356 mmBTUs of fuel, and avoid 4,067 MTCO2e.

Partnering with Eversource and UI to build a pipeline of energy efficiency projects at smaller state properties, leveraging the utilities' on-bill financing offerings. Our goal is to keep pace with pre-pandemic years and execute 20-30 projects that would save in aggregate at least \$320,000/year in energy costs.

Working with candidate state facilities under DEEP's State Energy Program federal grant to conduct Renewable Thermal feasibility studies assessing the opportunities, options, and costs associated with transitioning building heating and cooling away from fossil fuels and deploying solutions like heat pumps.

Facilitating, with the CT Green Bank, the construction of 11 solar arrays on state property, estimated to collectively generate 14.6 million kWh/year. Additional properties will be undergoing feasibility assessments.

Enhanced Materials Management

DEEP will be collaborating with consultants to provide technical assistance to state pilot sites implementing food scrap diversion and collection.

DEEP and DAS will work to revise the statewide trash and recycling contract to better meet the data needs and sustainability materials management goals of EO 1.

Electric Vehicle Infrastructure

DAS Fleet will be identifying a dozen candidate sites across state government to replace conventional vehicles with electric passenger vehicles, and install supporting charging infrastructure. The state will plan to leverage Volkswagen Settlement Funds and federal funds to help reimburse the expenses associated with supply infrastructure.

Streamlined Data Management

DEEP will be working with water utilities and waste service providers to collect and automate additional state data, reducing the administrative burden on agencies and enabling a broader assessment of the costs and reduction opportunities associated with the state's waste generation and water use. Because four water utilities cover 47% of state water accounts, automating water utility invoice uploading to EnergyCAP will create significant efficiencies.

In addition to infrastructure, GreenerGov CT will be providing behavioral program assistance to agencies as they develop plans for what a return to the office will look like, including:

- Implementing food scrap collection in cafeterias and employee break rooms;
- Identifying and disseminating best practices for recycling/rubbish infrastructure configuration, signage, and collection;
- Developing guidance for agency procurement staff on resupply centers and Environmentally Preferable Purchasing; and
- Conducting periodic waste audits of agency trash streams to determine opportunities for improved materials management.



portal.ct.gov/greenergov