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A Lead by Example Initiative

2022 PROGRESS REPORT

This report summarizes progress on the implementation of Connecticut's State sustainability initiative and meets the reporting requirements of Executive Orders No. 1 and 21-3.

APRIL 2022

Introduction

On April 24, 2019, Governor Lamont launched the GreenerGov CT initiative by signing Executive Order No. 1 (EO 1) which directs Executive Branch agencies to advance environmental leadership resulting in cost savings for taxpayers. The Order calls on agencies to recommit to and expand the State's Lead by Example (LBE) program to reduce operating costs and environmental impacts of State government facilities and operations. EO 1 builds on the foundation of the LBE program, invoking deeper levels of commitment and participation by setting new sustainability goals for Executive Branch agencies. EO 1 requires Executive Branch agencies to:

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

Item (D) of EO 1 directs the Steering Committee on State Sustainability, comprised of appointed Senior Sustainability Officers and delegates from over 30 State Agencies, to establish specific subordinate goals and interim targets to meet the overall goals. Executive Order No. 21-3 (EO 21-3) accomplishes this directive by setting the following commitments:

- By 2024, all Executive Branch agency facilities, to the extent practicable, shall implement an organics and food waste diversion program.
- By 2030, all electricity purchased and generated by the Executive Branch will be 100% zero carbon.
- By 2030, all newly leased light duty state vehicles shall be zero emission vehicles.
- By 2023, DEEP and DAS shall develop a plan to retrofit existing fossil fuel-based heating and cooling systems at state buildings to systems capable of being operated without carbon emitting fuels.
- By 2023, DEEP and DAS shall develop a plan, and a budget to achieve zero-GHG emissions for all new construction and major renovations funded by the State or in facilities owned/operated by the Executive Branch, targeting construction beginning in fiscal year 2024 and after.
- By 2024, the State shall divest 1% of all Executive Branch building square footage, and an additional 2% by 2028.
- The State shall deploy an average of 10,000 kWDC of new solar capacity annually for the next 10 years, primarily new projects sited on state buildings or property.
- The State shall commit to reducing Executive Branch building GHG emissions by at least 1 % annually.

The newly established climate commitments are based on analysis conducted in 2021, which mapped out the investments and savings pathways necessary to reach EO 1 targets. Using the best available data, this analysis examined sector-specific strategies to meet the goals of EO 1, quantifying the potential energy reduction, savings, and costs of each strategy.

Progress at a Glance

EO 1 Target	Metric	FY20	FY21
Reduce GHG emissions by 32.53% from a FY19 baseline by 2030	Change in GHG Emissions (MTCO _{2e}) from FY19 baseline	-11.1%	-13.7%
Reduce waste disposal by 25% from a 2020 baseline by 2030	See page 10	N/A	N/A
Reduce water consumption by 10% from a FY19 baseline by 2030	Change in Water Consumption (kGal) from FY19 baseline	+2.03%	-7.03%

EO 21-3 Target	Metric	FY20	FY21
By 2024, all Executive Branch agency facilities, to the extent practicable, shall implement an organics and food waste diversion program.	Number of facilities with contracted composting service	2	2
By 2030, all electricity purchased and generated by the Executive Branch will be 100% zero carbon.	% of renewable electricity usage	20%	22%
By 2030, all newly leased light duty state vehicles shall be zero emission vehicles.	Percentage of newly leased vehicles that are EVs	0%	1.67%
By 2024, the State shall divest 1% of all Executive Branch building square footage, and an additional 2% by 2028.	Change in Executive Branch square footage from FY19 baseline	-3.9%	-6.3%

Progress at a Glance

EO 21-3 Target	Metric	FY20	FY21
The State shall deploy an average of 10,000 kWDC of new solar capacity annually for the next 10 years,	Total Planned solar capacity (kWDC)	19,341	24,247
The State shall commit to reducing Executive Branch building GHG emissions by at least 1 % annually.	Building GHG emissions change from prior year (MTCO _{2e})	-11.3%	-3.3%

EO 21-3 Target	Progress
By 2023, DEEP and DAS shall develop a plan to retrofit existing fossil fuel-based heating and cooling systems at State buildings to systems capable of being operated without carbon emitting fuels.	GreenerGov CT is in the process of assembling a cross-agency Building Retrofit Team to develop this plan.
By 2023, DEEP and DAS shall develop a plan and a budget to achieve zero-GHG emissions for all new construction and major renovations funded by the State or in facilities owned/operated by the Executive Branch, targeting construction beginning in fiscal year 2024 and after.	GreenerGov CT is in the process of assembling a cross-agency Net-Zero New Construction Team to develop this plan.

Reporting Requirements

This 2022 Progress Report satisfies the Executive Order 1 requirement 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 Conn. Gen. Stat. §16a-37u.

All 28 Executive Branch designated agencies and an additional six voluntary agencies submitted annual Sustainability Performance Plans 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 public transparency of State actions and facilitate information-sharing and collaboration with municipalities, organizations, businesses, and other states pursuing similar LBE programs.

Steering Committee 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.

Senior Sustainability Officers for Connecticut State agencies participating in EO 1 are as follows:

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
 Doralis Hernaiz
 Cheryl Arora
 Noel Petra; Michael Barrera
 Michelle Provost
 Nathan Wilson
 Jacqueline Shirley
 David Barry; John McCarthy
 Jason Cohen
 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
 Rori Ziegwied
 Sgt. Kevin Gridley; Willis Ballard
 Michael Carragher
 Chris Lyddy
 Paul Hinsch
 Jen Loo
 Keith Norton

Senior Sustainability Officer

Joseph Geremia
 Maura Martin
 Eric Connery
 Eric Shrago
 Cynthia Petruzello
 Barbara Petano
 Keith Epstein
 Elizabeth Graham
 Van Kolton
 Michael Jednak; Patrick McKee
 Eric Kruger

40 AGENCIES PARTICIPATING IN EO 1

29 EXECUTIVE BRANCH AGENCIES DIRECTED TO PARTICIPATE

11 VOLUNTARY STATE AGENCY PARTICIPANTS

Data Dashboard

The data below summarizes the utility use and expenditures data for FY19 through FY21 for Executive Branch agencies. The data was pulled from the state's utility tracking system, EnergyCAP, on March 23 2022, 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-FY21

Executive Branch Agencies

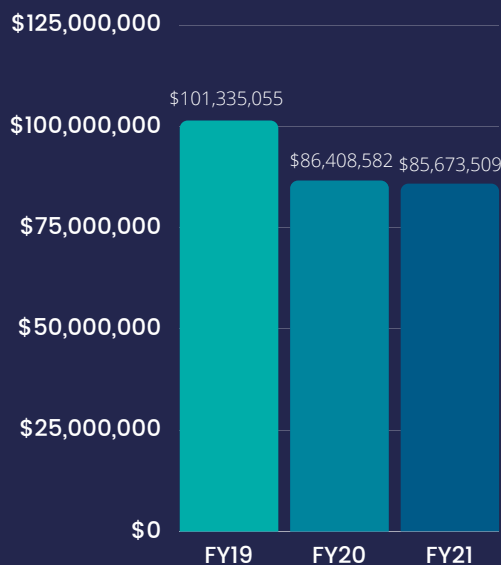
	Use					Cost			
	FY19	FY20	FY21	Unit	Change	FY19	FY20	FY21	Change
Electric	281,200,258	265,891,594	255,642,547	kWh	-9%	\$45,146,637	\$40,838,138	\$39,900,665	-12%
Natural Gas	12,055,819	11,504,576	11,499,405	CCF	-5%	\$11,036,370	\$9,561,239	\$10,191,343	-8%
Other Building Energy	442,605	287,513	248,498	MMBtu	-44%	\$5,895,913	\$4,906,938	\$4,654,274	-21%
Vehicle Diesel	1,862,910	1,559,813	1,832,485	Gal	-2%	\$6,054,458	\$4,617,048	\$5,149,283	-15%
Vehicle Gasoline	4,411,549	4,068,020	3,619,038	Gal	-18%	\$11,867,067	\$9,844,608	\$9,156,165	-23%
Total GHG Emissions	228,696	203,234	197,297	mtCO2e	-14%				
Water & Sewer	3,405,640	3,474,717	3,166,331	Kgal	-7%	\$11,980,086	\$9,930,696	\$8,698,643	-27%
Waste Disposal	-	-	-			\$9,354,523	\$6,709,914	\$7,923,136	-15%
Total						\$101,335,055	\$86,408,582	\$85,673,509	-15%

*Gasoline and diesel costs estimated based on average monthly cost from EIA.gov, \$2.53 for gasoline and \$2.81 for diesel in FY21; \$2.42 for gasoline and \$2.96 for diesel in FY20; \$2.69 for gasoline and \$3.25 for diesel in FY19.

**Other Building Energy sources include oil, propane, steam, chilled water, and hot water.

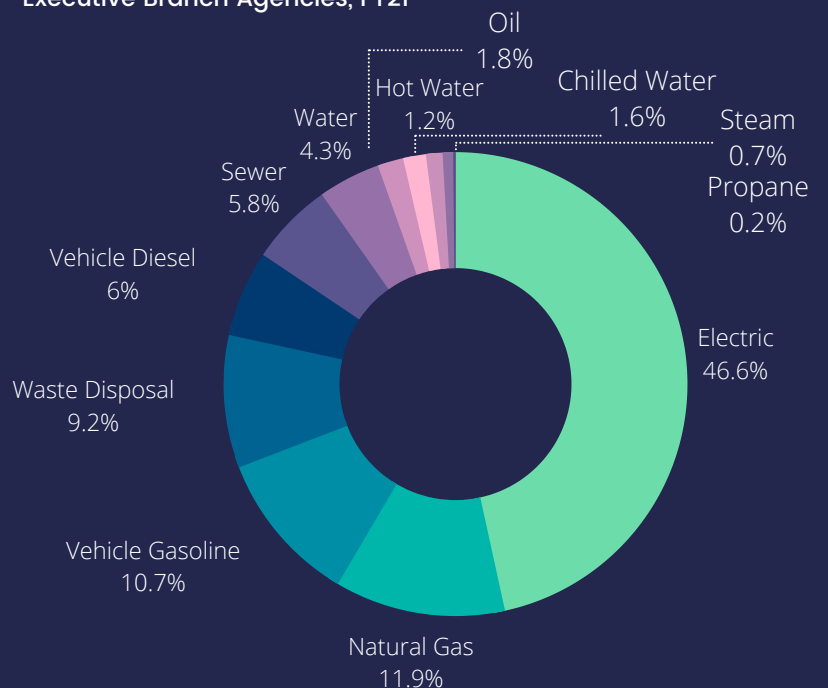
UTILITY EXPENDITURES

Executive Branch Agencies, FY19-FY21



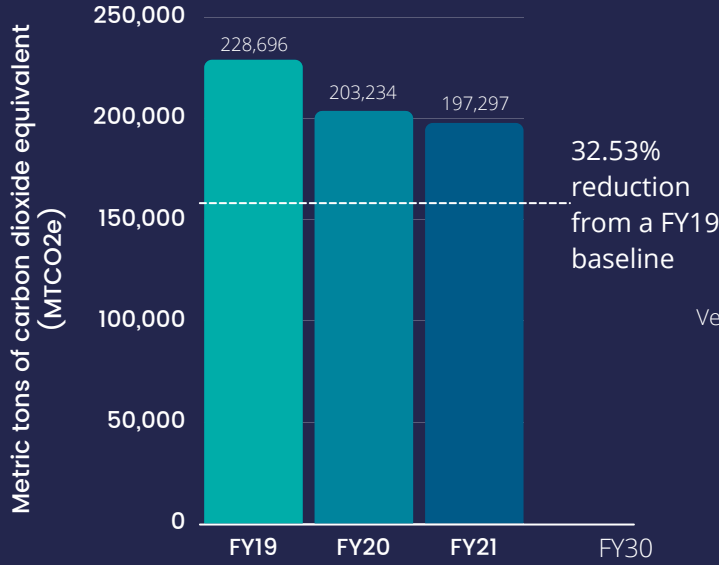
UTILITY EXPENDITURES BY COMMODITY

Executive Branch Agencies, FY21



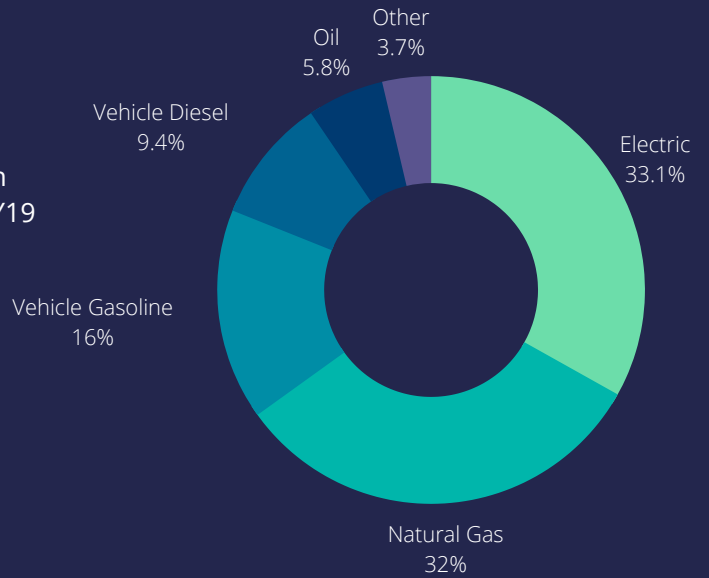
TOTAL GHG EMISSIONS

Executive Branch Agencies, FY19-FY21



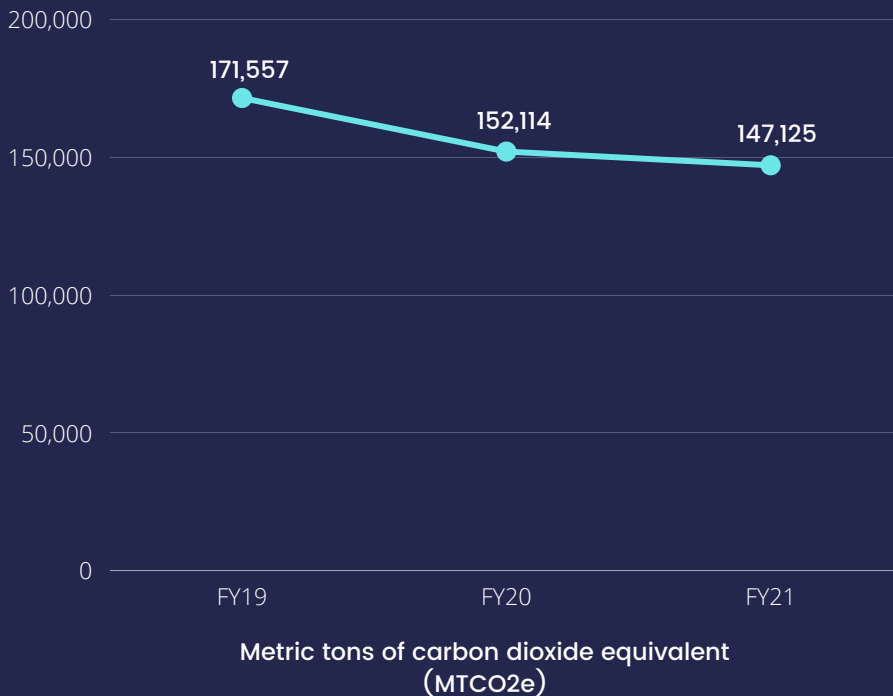
GHG EMISSIONS BY COMMODITY (MTCO2E)

Executive Branch Agencies, FY21



GHG EMISSIONS FROM BUILDING ENERGY USE

Executive Branch Agencies, FY19-FY21



GHG emissions from building energy use

-11%

change from FY19-FY20

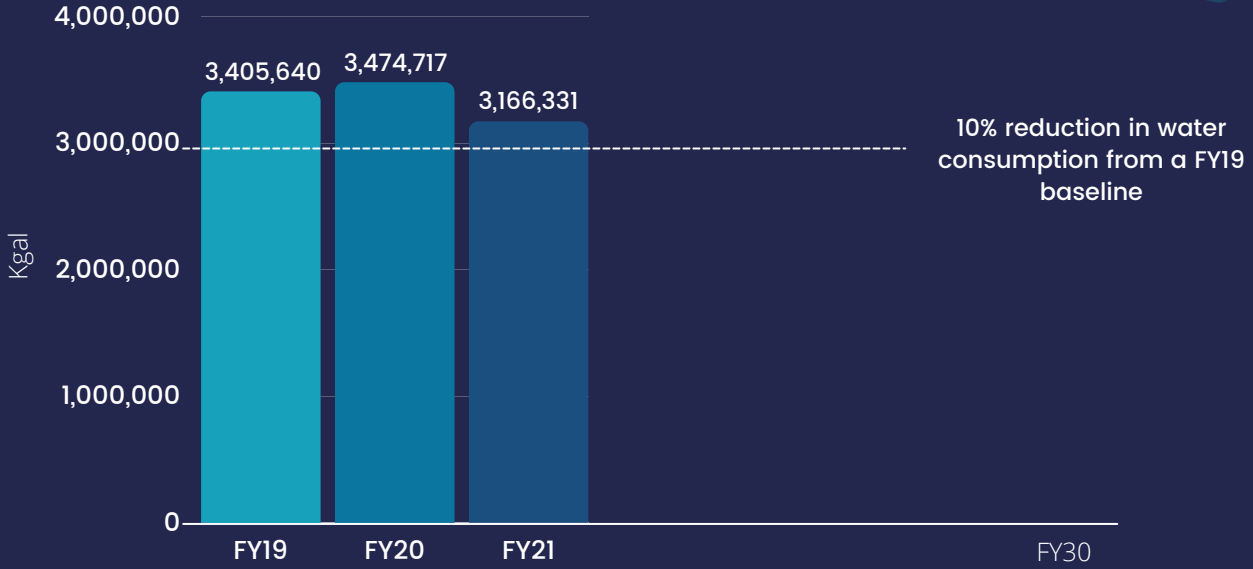
and

-3%

change from FY20-FY21

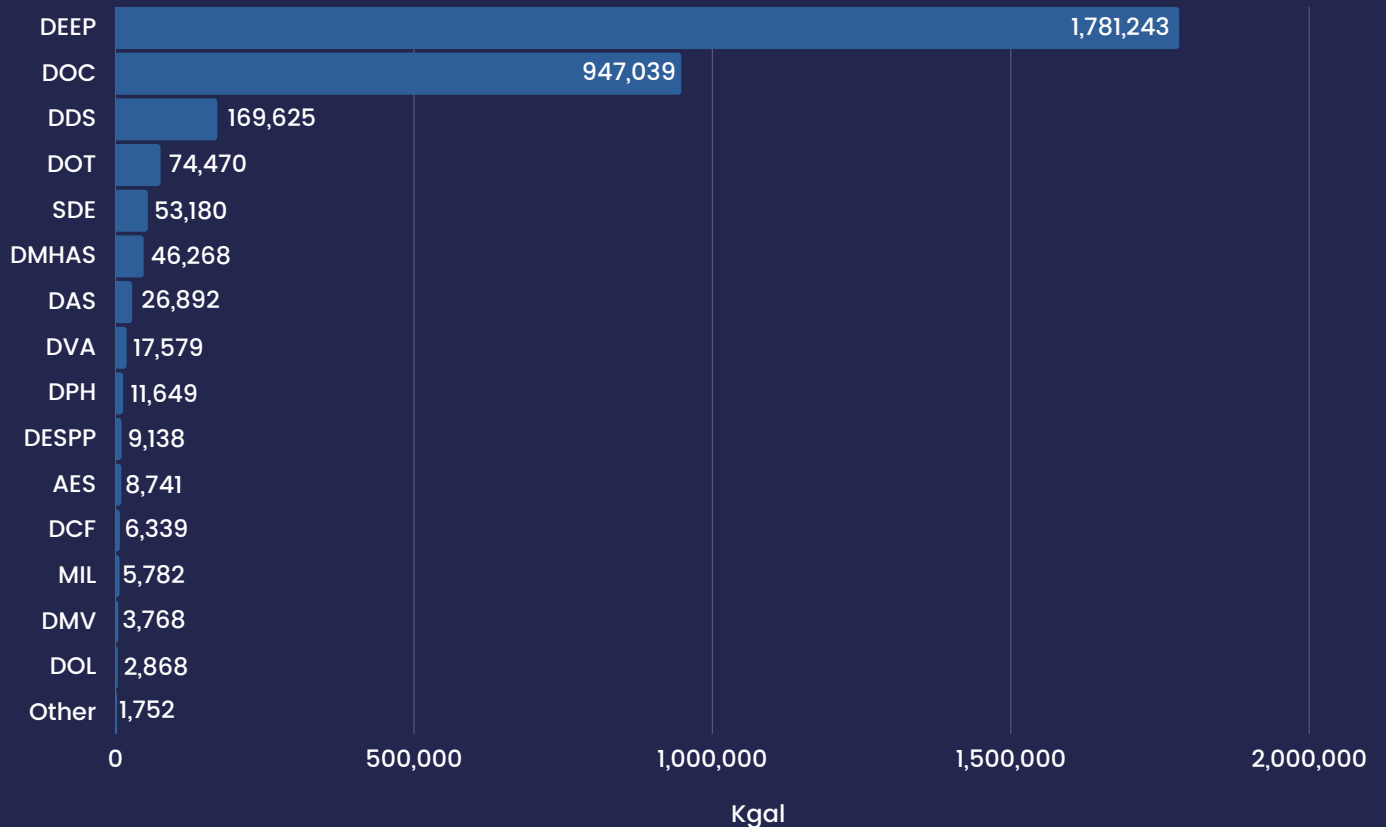
WATER/SEWER USE

Executive Branch Agencies, FY19-FY21



WATER/SEWER USE BY AGENCY

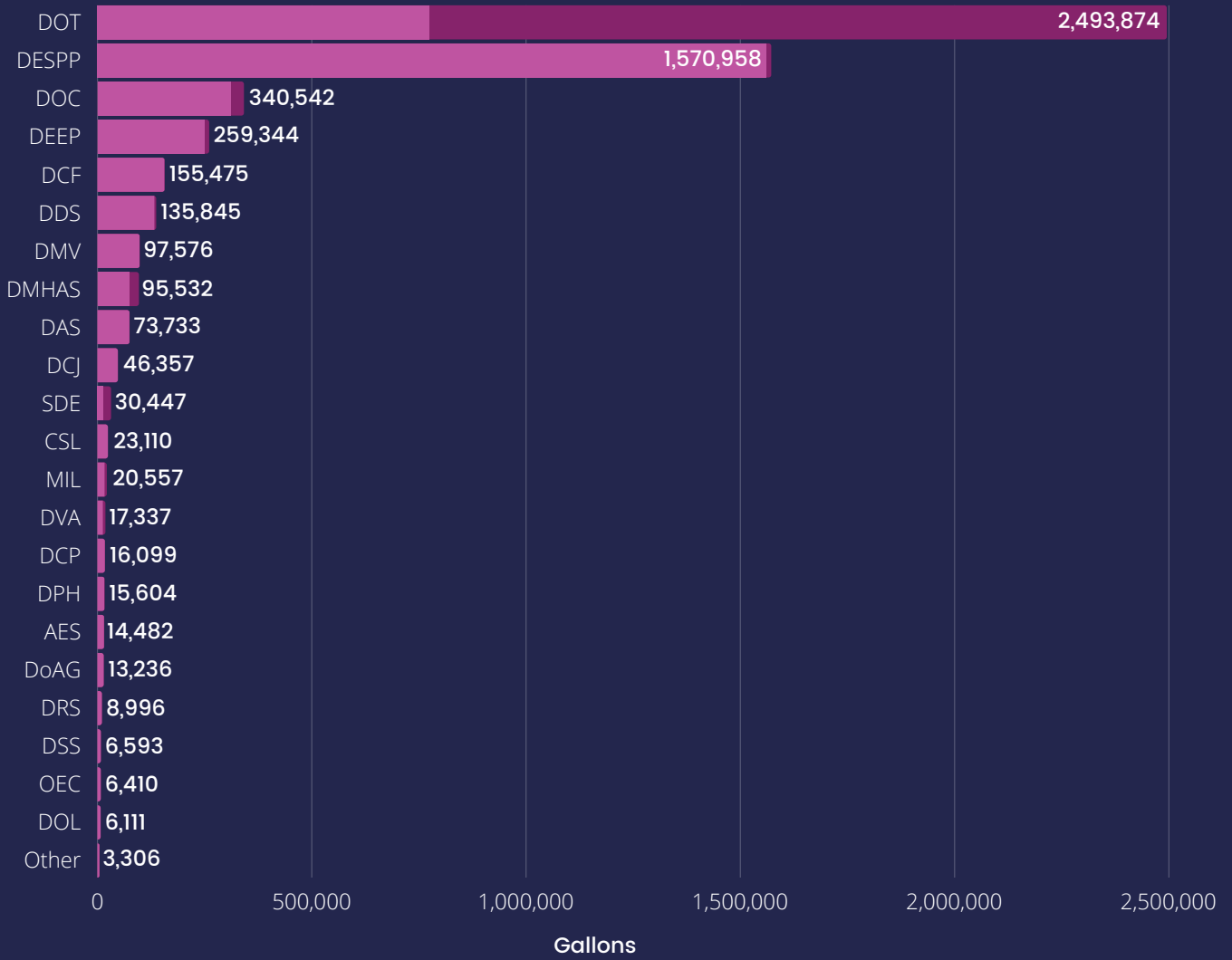
Executive Branch Agencies, FY21



GAS & DIESEL USE BY AGENCY

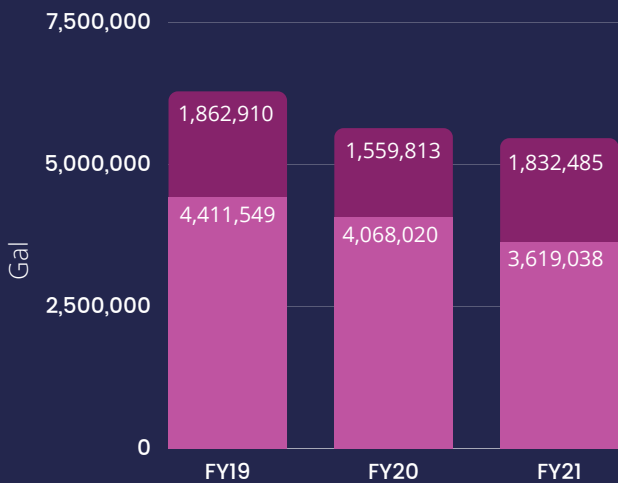
Executive Branch Agencies, FY21

Gasoline Diesel



GAS & DIESEL USE

Executive Branch Agencies, FY19-FY21



Diesel use down 2% since FY19



Gasoline use down 18% since FY19



Data and Methodology



To track State government utility data, agencies or vendors upload utility bills and usage information to EnergyCAP, the State's online energy management software, which centralizes collection of thousands of utility bills from across the State's operations and facilities.

Translating the GHG Reduction Goal

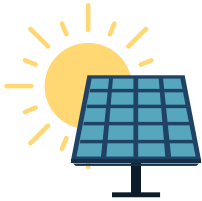
Although EO 1 calls for a 45% reduction in GHG emissions by 2030 compared to a 2001 (or 2014) baseline, State government activity data was unavailable for either target baseline. Instead, GreenerGov CT calculated the 2030 GHG reduction goal as a percentage change from a FY19 baseline, which was the earliest year with 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.

Waste Data Methodology

Measurement of the rate of waste generation requires quantification of waste materials and an accurate measure of facility occupancy over a common time period. These measurements are made more meaningful with cohort data on facility type, waste and recycling infrastructure, presence/absence of on-site food service, and other contributors to both waste generation and diversion of non-waste materials. The Executive Branch agencies of the State of Connecticut participated in a facility information survey in 2019 resulting in a baseline for future refinement and measurement.

The process of improving waste diversion practices and performance can begin once a facility has developed accurate baseline measurements and useful cohort data. The Executive Branch facilities currently have a mix of metered and unmetered waste disposal, static and seasonal occupancy, varying levels of access to recycling and other diversion programs, and systemic restraints on waste management practices. GreenerGov CT's goal for gauging program performance is to implement a consistent measurement methodology with the ability to incorporate facility-specific factors. GreenerGov CT is exploring multiple approaches to this effort utilizing both internal and external resources.

Key Achievements



Solar Project Deployment:

Connecticut Green Bank is facilitating solar photovoltaic deployment at State buildings by securing zero emission renewable energy credit (ZREC) contracts for three rounds of pilot projects. Cumulatively, these pilot projects will comprise over 24,200 kWDC in solar capacity.



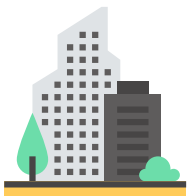
State Vehicle Telematics:

DAS's Fleet Operations Division is working to install telematics devices in the DAS light-duty fleet. In the past year, Fleet technicians have installed devices in approximately 3,000 vehicles, representing just over 90% of the total fleet. The telematics devices will enable vehicle and trip data collection such as idling time, fuel economy, and trip profiles that will inform decision-making on operational efficiency. Electric Vehicle Suitability Assessments are a key component of telematics, allowing DAS and client agencies to identify vehicles that are the best candidates for electrification based on their usage and trip profiles.



Heat Pump Pilot for DDS facilities:

The Department of Developmental Services is leveraging DEEP's State Energy Program grant funding to conduct comprehensive energy assessments at six of their group homes. In addition to receiving complimentary weatherization services as a part of the Home Energy Solutions – Income Eligible Program, these homes will be retrofitted for measures such as renewable thermal heating and cooling (mainly heat pumps), solar PV, and efficient windows.



Strategic Building Divestment:

Under Conn. Gen. Stat. 4-67g, OPM is directed to establish long-term planning for increased efficiencies in state-owned real property. During this past challenging pandemic year, OPM and DAS have identified opportunities to reduce the state's carbon footprint through building divestment. In 2021, the Executive Branch reduced its carbon footprint by vacating two Hartford office buildings totaling over 150,000 square feet.



Project Highlights

GreenerGov CT aims to make energy- and cost-saving sustainability practices “business as usual” across State facilities and operations. The Executive Branch and voluntary agencies implemented over 100 projects, policy changes, and initiatives in the last year, most of which were completed by the end of 2021. Executive Branch Agency Sustainability Performance Plans demonstrate the breadth and depth of actions agencies are taking to integrate sustainability into their operations.



Upgrading to LEDs

Department of Mental Health and Addiction Services conducted campus-wide LED lighting upgrades at the Connecticut Valley Hospital in Middletown. All exterior site lighting was upgraded, with an estimated annual energy savings of 218,988 kWh.

Reducing State Vehicle Fuel Use

Department of Transportation is working on the construction and design of additional EV charging infrastructure at Headquarters and District Offices. Department of Transportation recently completed the installation of new public charging stations at Headquarters. In total, there are now 29 Level 2 chargers onsite with over 54 outlets/plugs available for EV drivers to charge. The newly installed EV charging units will serve both employees and fleet vehicles. Department of Transportation hopes to spur the adoption of electric vehicles and lead by example by enabling employee charging at work and incorporating EVs into the motor pool.





Reducing, Re-Using, Recycling

Department of Social Services reviewed its contracted dumpster services, and made efficiency improvements, including converting cardboard dumpsters to single stream recycling, adjusting dumpster sizes, and modifying pick-up frequency. These changes will improve management of recyclable materials and reduce the need for dumpsters at the agency.

The Connecticut Lottery Corporation conducted a recycling campaign to promote waste reduction, including increasing awareness of appropriate recycling practices at home.

The Connecticut Housing Finance Authority cut its trash and recycling generation by half in 2021, reducing waste disposal and saving approximately \$1,600 in waste services costs annually.

Upgrading Building Heating and Cooling

The Division of Criminal Justice upgraded the HVAC system at its Rocky Hill location, selecting energy efficient systems for optimal air flow and air quality with more reliable controls for energy usage than the previous HVAC system.

The Department of Motor Vehicles made significant upgrades to the Norwalk location, including a new roof, insulation, and HVAC system for the entire branch location. These upgrades are expected reduce building energy use and natural gas, oil, and electricity consumption.





Expanding Nature-Based, Efficient Infrastructure

Department of Transportation developed a pollinator habitat at Headquarters' parking area and established 26 new Conservation Areas in highway rights-of-way in 2021, bringing total DOT Conservation Area coverage to around 180 acres. Increased Conservation Area coverage reduces required mowing, which save operating costs, fuel, and associated greenhouse gas emissions.

Department of Transportation completed construction on 12 Community Connectivity Projects in Bridgewater, Canton, Cheshire, East Hartford, Ellington, Essex, Glastonbury, Meriden, Old Saybrook, Simsbury, and Tolland. DOT invested over \$3 million in Community Connectivity projects to create urban trail sections, enhance bicycle and pedestrian access, increase safety, and improve connections to public transit.

Optimizing State Facility Footprints

The Department of Energy and Environmental Protection manages and maintains a variety of buildings that collectively amount to approximately 1,692,164 of gross square footage. Strategically merging facilities and operations, and properly reducing unnecessary building space will reduce energy and water consumption, and lower operation and maintenance costs. In FY21, facility managers and DEEP engineering staff used asset management software and the National Park Service's asset priority index (API) methodology to assess all of DEEP's 1,006 buildings at its 98 locations.

The complete portfolio of API scoring provides a quantitative means to determine which buildings are mission critical, and which are not and should be properly divested. In FY21 and going forward, DEEP is using this data to prioritize proposed construction and maintenance projects.



Auditing and Energy Efficiency Projects

Audit Process and Results Overview

In 2020, Department of Administrative Services Division of Construction Services (DCS) engaged five energy audit firms to conduct level 2 American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) energy audits at 32 State facilities. Of the 32 facilities, DCS received and finalized 24 complete audit reports. These audit reports identified several energy efficiency measures, from lighting and controls to boiler and chiller replacements, estimated to save the State over \$2 million in energy costs, 96 thousand MMBtu, 46 million gallons of water, and reduce greenhouse gas emissions by over two thousand metric tons.

Project Selection and Funding

Criteria were developed by DEEP, based on various metrics related to emission reduction potential, water savings, and economic payback. Based on these criteria, the interagency Technical Advisory Committee (TAC) determined project prioritization for the subset of audited facilities. Along with previously audited projects, TAC approved additional funding for the Quinebaug Fish Hatchery, a LBE legacy project. DEEP had \$28 million in bond authorization to use towards energy and water efficiency projects. The list of top projects went to the Bond Commission to secure funding to move forward with implementation.

At the July 23 Bond Committee meeting, DEEP received \$14 million of the \$28 million requested. The top seven audit projects and Quinebaug Fish Hatchery were selected as phase one projects to use the \$14 million. At the December 21 Bond Committee meeting, DEEP received the additional requested \$14 million that will go towards funding a second phase consisting of 11 other audited projects.

Energize CT Program Participation

In 2014, Eversource, United Illuminating and DAS (on behalf of all State agencies) developed a Master Agreement to allow State agencies to participate in the utilities' Small Business Energy Advantage Program. The program provides cost-effective, turnkey energy-saving services. In 2020, the Master Agreement was updated by DEEP, DAS, Eversource, and UI, to allow State agencies to participate in all utility programs in the Conservation and Load Management (C&LM) Plan via Energize CT.

In 2021, the utilities received 27 requests from State agencies to participate in C&LM programs. Some of these requests included measures identified in the 24 energy audit reports and are therefore exempt from the usual DCS process. Since 2014, 165 projects have been completed, saving an estimated \$2 million and 11.8 million kWh annually.

What's Next in 2022



Supporting solar deployment and developing a project pipeline

GreenerGov CT will continue to identify new State locations for solar PV deployment to achieve the EO 21-3 goal of deploying 10,000 kWDC in new solar capacity each year and support statewide electric decarbonization efforts.

Increase organic waste diversion

A key priority for the waste sector is increasing diversion of food scraps at Executive Branch facilities. Currently, only two facilities have contracted for organic diversion services, and both are office facilities with limited organics material due to COVID-related building occupancy reductions. In 2022, GreenerGov CT will focus on larger-scale organic diversion pilot programs at select DOC facilities and Connecticut Valley Hospital. GreenerGov CT will use these pilots to develop technical assistance for agencies to implement organics diversion programs and will continue to promote in-house composting programs run by volunteers.

Identifying candidates to participate in turnkey Energize CT programs

The GreenerGov CT team will work with the utilities to market the Energize CT programs to all agencies. The utilities hosted a webinar in 2022, that is posted on the GreenerGov CT website, as a resource for agencies. The agency resources webpage also has a step-by-step guide and request forms for program participation. DEEP will use EnergyCAP to identify buildings that would be good candidates for participation in the Energize CT programs, and that do not need to go through DCS or require much design work.

Prioritize State buildings for next round of energy audits

Using EnergyCAP benchmarking software, the Department of Energy and Environmental Protection will evaluate State buildings to see how their energy use and greenhouse gas emissions compare to one another and similar building types. These evaluation reports will be the basis of prioritizations for future building energy audits.

Issue an RFP for waste technical assistance

DEEP is coordinating with DAS to issue an RFP to create a master contract for vendors who can provide technical assistance/guidance for implementing sustainable materials management strategies. The master contract will help State agencies (as well as local and regional jurisdictions) seek services to improve the efficiency of their solid waste and recycling operations, improve or expand existing waste programs, generate significant cost savings related to waste disposal, and purchase reasonably priced equipment for waste diversion and water conservation. The master contract can be used for future State agency waste audit projects to help improve data collection and identify areas of focus for meeting the State's diversion goals.

Expand EV charging infrastructure at State facilities

Widely available public electric vehicle charging is critical to the adoption of EVs in Connecticut. GreenerGov CT is working with DEEP's Bureau of Energy and Technology Policy and State Parks Division to deploy additional public electric vehicle chargers in State parks. This project will increase the number of electric vehicle chargers at State Parks with already-existing chargers and install chargers in parks where there currently aren't any. The newly installed chargers, including the replacement of the existing older charging stations, will all be networked to collect utilization data and help maintain the operation of the charging stations for public use.

Begin design phase for project construction of the 2020 energy audit projects

DAS and DEEP have almost completed their review of the Memorandum of Agreement (MOA) for phase 1 projects. As soon as the MOA is signed by both DAS and DEEP Commissioners, the design phase can begin. For phase 2, the MOA is currently being drafted and will be executed later this year.

Prioritize coupling EVSE installations and EE upgrades

DAS, DOT, and DEEP have begun to identify facilities for EVSE installations to support both fleet charging and public charging. Sites that are selected for larger EVSE installations (four or more ports) should be prioritized for energy efficiency upgrades to help offset the impacts of EV charging. GreenerGov CT will include an EVSE assessment in evaluating potential energy efficiency project locations.

Continue strategic building-use decisions

In addition to identifying opportunities to reduce the State's carbon footprint, OPM is also exploring strategies to take advantage of ongoing teleworking, where possible. This unforeseen opportunity, originating in large part because of the pandemic, will allow State employees a greater ability to reduce their commutes and associated fuel use.





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