



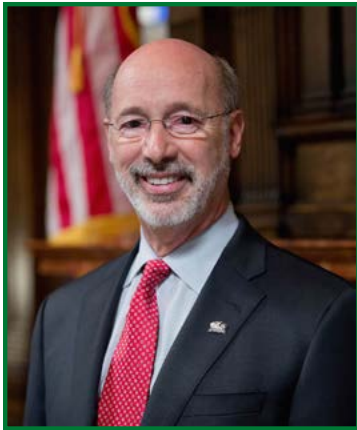
2021 Annual Report



Table of Contents

| | |
|---|-------|
| Message from the Governor | 4 |
| Executive Summary | 5 |
| Introduction | 6-7 |
| Agency Energy Reductions | 8-11 |
| Passenger Fleet Electrification & Vehicle Miles Traveled..... | 11-16 |
| Energy Procurement & Renewable Energy Investments | 16-17 |
| High-Performance Buildings..... | 18-22 |
| Agency Certification Checklist & Focus Groups | 22-29 |
| Conclusion..... | 29 |





Message from Governor Tom Wolf

2021 was again a year of challenge and opportunity as Pennsylvania and other states confronted COVID-19. Like many Pennsylvania businesses, the commonwealth advanced “virtual business” solutions to address the social distancing demands and keep the commonwealth open for business. Virtual business solutions are not new concepts and have always been a part of a modernization strategy; however, the pandemic has necessitated an expedited transition. Commonwealth agencies are tasked with finding the right balance of virtual and in-person services to maintain access to vital government services for all Pennsylvanians.

In addition to customer service enhancements and cost savings, the shift of portions of the commonwealth’s operations to a virtual environment creates the opportunity for significant climate benefits. As we know, buildings and transportation account for about 60-percent of Pennsylvania greenhouse gas emissions. Virtual business enhancements, in conjunction with strategic planning around space consolidation and reductions in business travel create new opportunities for greenhouse gas savings. As we turn the corner on COVID-19 in 2022, I encourage all units of government and Pennsylvania businesses to set goals and develop strategies for comprehensive space consolidation and efficient business travel. We will need to explore these opportunities and continue to reinvent the way we work to meet our collective goal of reducing carbon emissions 80-percent by 2050.

In 2021, the commonwealth began implementation of a [Pennsylvania Climate Leadership Academy](#) . The Academy has an advisory board consisting of state, local government, business, and institutional leaders who are interested in advancing climate education and preparedness in Pennsylvania. A main goal of the academy is to educate Pennsylvania leaders and build capacity in our professional workforce to effectively address climate change. We are not only going to need technology solutions, but we must also build the professional capacity in Pennsylvania’s workforce to deliver on our climate goals. This Academy is a first step to create the necessary human capital solutions needed to mitigate and manage the impacts of climate change.

In addition, I am pleased to report there were several initiatives in 2021 that will significantly support our climate progress and reduce our carbon footprint in upcoming years.

- The Regional Greenhouse Gas Initiative (RGGI) was approved by the Environmental Quality Board on July 13th, 2021 and will now move on to the implementation phase in 2022. RGGI is a carbon dioxide cap and investment program implemented through a cooperative partnership of northeast and mid-Atlantic states. Participating in RGGI allows Pennsylvania to cost effectively reduce emissions from the power sector, while investing program proceeds into additional air pollution reduction programs.
- The Department of General Services announced the strategic procurement of 191 megawatts of in-state solar through the [Pennsylvania PULSE](#) (Project to Utilize Light and Solar Energy). The Pennsylvania PULSE project will be the largest single procurement of solar energy announced from any federal, state, or local government organization in the United States. The project is anticipated to come online in 2023 and cover approximately half of our electricity usage supplied by commonwealth paid electricity accounts. It is a unique model that could be adopted by other entities in Pennsylvania, as well as other states with deregulated electricity markets.
- The Department of General Services finalized the requirements for a High-Performance Lease Program. Starting in 2022, the program will require all new or renewed leases for commonwealth office spaces over 20,000 square feet to incorporate energy efficiency measures and track performance during the term of the contract.

Finally, President Biden signed the Infrastructure Investment and Jobs Act in 2021 and work continues on the Build Back Better plan. There are many aspects of this Act and the Build Back Better Plan that are tied to helping all of us achieve our energy and climate related initiatives and policies. My administration is looking forward to developing the programs and investment strategies needed to get these dollars working in Pennsylvania and support a clean energy economy that benefits working Pennsylvanians and those most at risk to the hardships of climate change.

A handwritten signature in black ink that reads "Tom Wolf". The signature is fluid and cursive, with the first name "Tom" and last name "Wolf" clearly legible.

Tom Wolf
Governor

Executive Summary

The GreenGov Council is pleased to provide our third annual report that details how the commonwealth is collectively meeting the four primary performance goals of the GreenGov program. The report documents ways that individual agencies are ‘leading-by-example’ by incorporating environmentally sustainable practices into their operations.

The report is intended to serve as an annual benchmark measurement of the performance goals, summarize achievements to date, and provide recommendations to commonwealth agencies for continuous improvement on sustainability.

In 2021, the commonwealth has demonstrated progress on the four primary performance goals as follows:

- A 3.2-percent normalized energy reduction within commonwealth facilities from the previous year with actual cost savings of over \$914,000. Without the energy reductions occurring this year, the commonwealth’s total utility expenses would have likely increased due to an overall increase in supply cost for these fuels.
- 308,978 MWhs of Renewable Energy Credits (RECs) were procured for 2021, offsetting 40-percent of the commonwealth's total electricity load for the year. The actual energy cost savings achieved far surpassed the additional REC procurement costs. This purchase ranks the commonwealth #49 on the U.S. EPA's Green Power Partnership National [Top 100 list](#).
- The commonwealth has 16 EV models available on the state vehicle procurement contract for 2021/22, up from 5 models available in 2020/21, along with 55 additional charging plugs to support the transition to vehicle electrification.
- Fourteen new construction or major renovation facilities projects incorporating the high-performance building criteria have been added to the construction queue this year for a total of 30 to date.

Agency ‘Lead-By-Example’ Highlights & Achievements

Commonwealth agencies have continued making progress on sustainability throughout 2021. Highlights of these achievements include:

- For the third year, all agencies conducted an internal review of their sustainable business processes and submitted their [GreenGov Agency Certification Checklists](#), demonstrating their progress in meeting sustainability and efficiency goals.
- The Pennsylvania Department of Corrections (DOC) began participating in the U.S. Department of Energy’s (U.S. DOE) [Better Buildings Sustainable Corrections Infrastructure Partnership](#), exploring ways to save energy, water, and advance renewable energy in the commonwealth corrections facilities through U.S. DOE technical assistance.
- The Department of General Services (DGS) finalized the requirements for a High-Performance Lease Program. Starting in 2022, the program will require all new or renewed leases for commonwealth office spaces over 20,000 square feet to incorporate energy efficiency measures and track performance during the term of the contract.
- For the second year in a row, the DGS Bureau of Procurement was awarded a 2021 EPEAT Purchaser Award through the [Global Electronics Council](#) for its excellence in purchasing sustainable electronics.
- DGS announced the strategic procurement of 191 megawatts of solar through the [Pennsylvania PULSE](#).
- The Department of Conservation & Natural Resources (DCNR) attained U.S. Green Building Council LEED Certification for Hickory Run State Park Visitor Center and Office.
- The commonwealth’s Management Directive [720.05](#), Energy Management and Conservation in Commonwealth-Owned and Leased Facilities was updated on September 21, 2021, to reflect new energy programs and opportunities.

1. Introduction

Pennsylvania's climate goal is to reduce net greenhouse gas emissions 26-percent by 2025, and a further 80-percent reduction by 2050 (from 2005 levels). In September, the commonwealth published its [2021 Climate Action Plan](#) which identifies 18 strategies in electricity generation, transportation, agriculture, fuel supply, and residential and commercial building that quantitative modeling shows will meet those goals. Pennsylvania's goal is aligned with 25 other states across the nation under the partnership of the [U.S. Climate Alliance](#) (Alliance). Member states of the Alliance commit to achieving similar greenhouse reduction goals with the intent of keeping temperature increases below 1.5 degrees Celsius.

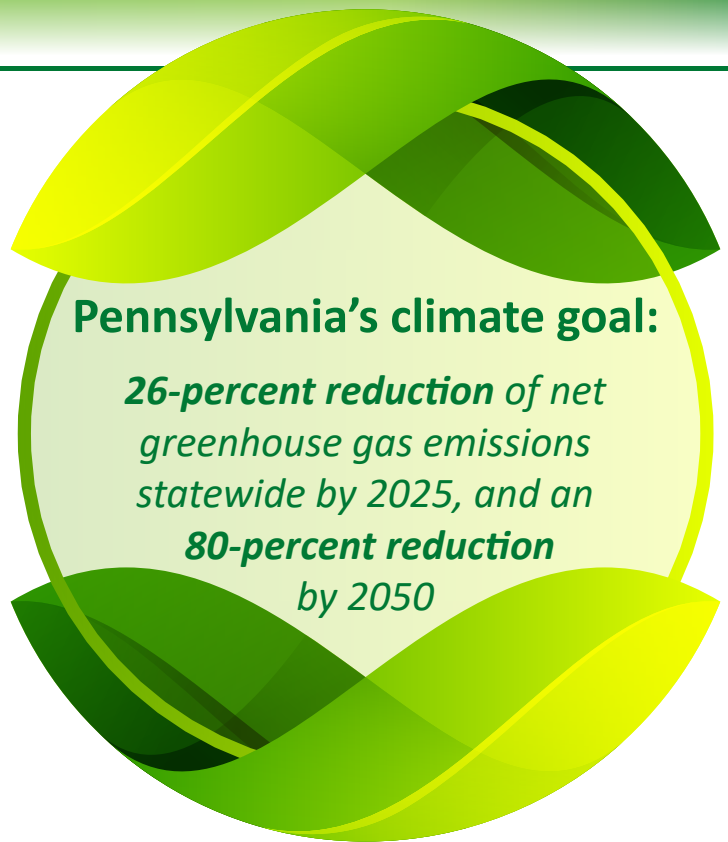
The GreenGov Council oversees and tracks the performance goals that state agencies are required to meet, to lead-by-example on carbon pollution reduction. The performance goals are intended to be the foundation, by which commonwealth agencies strive to support the overall climate goals for Pennsylvania. These performance goals are as follows:

- Reduce overall energy consumption by 3-percent per year through 2025;
- Replace 25-percent of the state passenger fleet with Battery Electric Vehicles (BEVs) and Plug-In Hybrid Electric Vehicles (PHEVs) by 2025, and evaluate opportunities to reduce vehicle miles traveled;
- Procure renewable energy to offset at least 40-percent of the commonwealth's annual electricity, and/or directly purchase renewable power generation sited within PA;
- Build any new buildings, major renovations, build-to-suit leased buildings to high-performance building standards.

1.a. About the Annual Report

The GreenGov Council has developed several tools and strategies to track and highlight progress as well as demonstrate transparency and accountability towards our goals. These methods will continue to be refined to foster a more robust understanding of the commonwealth's carbon footprint and explore new pathways forward for increasing environmentally sustainable operations. A brief description of the GreenGov benchmarking tools and strategies are described below.

A.) Commonwealth Utility Benchmarking Initiative: In early 2018, the commonwealth began the delivery of a utility benchmarking initiative. This involves managing our utility bills within a



common online platform, so that building performance can be tracked over time. The commonwealth of Pennsylvania stands to save energy and money from this initiative, as facility managers and financial staff use benchmarking to identify operational improvement opportunities, and steer capital investment planning through identification of underperforming buildings.

The commonwealth's utility benchmarking initiative is supported by EnergyCAP, a Pennsylvania registered veteran owned small business. Penn State Facility Engineering Institute, or PSFEI, is assisting the commonwealth in the management and implementation steps necessary to support this enterprise-wide benchmarking effort.

The initiative directly informs progress on the performance goal of reducing energy use by 3-percent per year. The results are summarized in Section 2.

B.) Fleet Vehicle Accounting & Tracking: The DGS Bureau of Vehicle Management, PennDOT's Bureau of Maintenance and Operations, and the PA Turnpike Commission manage the commonwealth's fleet vehicles. These include all motorized vehicles in Classes 1-8 (as defined by the Federal Highway Administration or FHWA), from light-duty passenger vehicles to heavy-duty road clearing snowplow vehicles, for example. Different strategies are employed to track and analyze

vehicles, including the use of telematics systems, fleet refueling card data analysis, and other business tracking methods deployed by these agencies. The combination of tools and business processes provide a comprehensive accounting of the estimated vehicle miles traveled and fuel consumption for the commonwealth fleet over the defined one-year period.

Fleet vehicle accounting & tracking is used to report progress on the transportation goal to transition the passenger fleet to battery electric or plug-in hybrid vehicles by 2025, and our environmental impacts from annual vehicle miles traveled. The results are summarized in Section 3.


C.) GreenGov Agency Certification Checklist: The GreenGov Agency Certification Checklist (Checklist) was developed for the purpose of assessing agencies' progress toward all goals and delivering sustainability within government operations. The Checklist serves as an annual assessment completed by each participating agency. Agencies will be able to assess their progress over time, compare their performance and initiatives with other similarly structured agencies, and identify new opportunities to green government.

The Checklist consists of the following categories: Benchmarking and Evaluation; Buildings and Structures; Transportation; Products and Materials; Culture; Renewable Energy; and Resilience. Agency GreenGov Agency Certification Checklist results are found in Section 6.

D.) GreenGov Focus Groups: The GreenGov Focus Groups are small-group interagency working groups that meet quarterly to discuss barriers and solutions to various sustainability-related topics. These six groups work to advance the performance goals and integrate sustainable solutions into agency business practices. All agencies are encouraged to participate in any groups that impact their business areas. Participants are encouraged to integrate ideas and strategies within their agency to support enhancing their GreenGov Agency Checklist scores in future years. The six focus groups are identified below.

- a. Utility Management
- b. Sustainability Teams
- c. EV and EV Charging
- d. Green Facility Management
- e. Products and Recycling
- f. Facility Construction & Leasing

GreenGov Focus Group activities and plans for 2021 are found in Section 7.

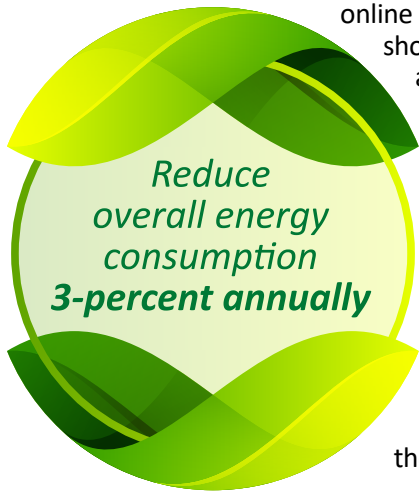


*The Commonwealth's Utility Benchmarking Initiative is supported by **EnergyCAP**, a Pennsylvania registered veteran-owned small business.*

ENERGYCAP®

2. Agency Energy Reductions

The purpose of the Commonwealth Utility Benchmarking Initiative is to develop, maintain and support an enterprise-wide building energy and utility management program. The initiative seeks to empower agencies to identify energy and utility cost savings opportunities in the buildings they occupy and where the commonwealth pays the utilities. This is accomplished by giving agencies access to their utility data, which can be viewed through various online dashboards and reports, showing usage, costs, bill anomalies, for examples.



The data rolled-up in various customizable reporting configurations is useful to facility managers and financial planners evaluating energy performance and its cost/budget implications from year-to-year in a building, or across the agency portfolio. Prior

to 2018, an enterprise-wide energy management and tracking platform was not available, and agencies were limited to tracking on their own spreadsheets or by other methods.

Each year, the Penn State Facilities Engineering Institute (PSFEI) assists the commonwealth with analyzing electric, gas, and steam meters and creating a fair assessment of where the commonwealth stands with our annual reduction performance goal. This year PSFEI validated 7,919, or 92-percent, of the 8,566 known metered accounts that passed established validation reporting criteria. For a utility meter account to meet the validation reporting criteria, the account must have two bills or less missing in the 24-month evaluation period. Weather normalization is then applied to the validated accounts. Weather normalization adjusts energy usage so it can be compared to energy usage in other years, eliminating weather as a factor in energy consumption to present a fair comparison.

PSFEI compared weather normalized energy consumption in 2019/20 to **actual consumption in 2020/21 fiscal year, with results indicating a combined 3.2-percent decrease in energy consumption.** Table 1 shows the breakdown by agency and the percent of meters that are currently reporting two fiscal years.

Table 1



**FACILITIES
ENGINEERING
INSTITUTE**

**Commonwealth Energy Consumption
FY2019/2020 - FY2020/2021**

| State Reporting Agency | Normalized Use (MMBtu) | Known Meter Count | % of Meters Reported | FY 2019 Baseline MMBtus | FY 2020 Current MMBtus | Energy Reduction | Metric Tons CO2 Reduction |
|--|------------------------|-------------------|----------------------|-------------------------|------------------------|------------------|---------------------------|
| Dept of Corrections | | 330 | 88% | 2,097,334 | 2,110,846 | 0.6% | (4,071) |
| Dept of Human Services | | 100 | 96% | 1,016,872 | 941,300 | -7.4% | 3,945 |
| Dept of Military and Veterans Affairs | | 813 | 96% | 509,064 | 537,922 | 5.7% | (24) |
| Dept of Transportation | | 3,490 | 99% | 413,410 | 391,531 | -5.3% | 1,501 |
| Dept of General Services | | 67 | 96% | 397,980 | 309,267 | -22.3% | 6,888 |
| PA State Police | | 1,145 | 87% | 118,625 | 113,393 | -4.4% | 388 |
| Dept of Conservation and Natural Resources | | 1,987 | 86% | 92,536 | 95,073 | 2.7% | (295) |
| PA Fish and Boat Commission | | 93 | 92% | 43,434 | 44,358 | 2.1% | (103) |
| Dept of Agriculture | | 15 | 60% | 38,952 | 43,735 | 12.3% | (243) |
| PA Emergency Management Agency | | 13 | 77% | 26,573 | 18,435 | -30.6% | 696 |
| Dept of Environmental Protection | | 121 | 84% | 25,416 | 23,062 | -9.3% | 199 |
| PA Historical and Museum Commission | | 139 | 68% | 19,240 | 17,587 | -8.6% | 133 |
| Dept of Labor and Industry | | 10 | 80% | 18,295 | 17,306 | -5.4% | 113 |
| Dept of Revenue | | 5 | 80% | 13,181 | 11,708 | -11.2% | 144 |
| PA Game Commission | | 235 | 91% | 13,172 | 12,822 | -2.6% | 32 |
| Dept of Health | | 3 | 100% | 9,803 | 9,481 | -3.3% | (32) |
| | | 8,566 | 92% | 4,853,886 | 4,697,827 | -3.2% | 9,274 |

* Energy consumption is weather normalized, removing weather anomalies and season variations. This allows for fair and direct comparisons from year-to-year in energy consumption.

* Multiple agencies energy consumption is rolled-up under Department of General Services (DGS), since DGS owns and operates buildings for many commonwealth agencies.

* A portion of the commonwealth agencies reside in lease space. Due to existing lease agreements, lessors pay the utility bills. Therefore, the commonwealth is currently not positioned to report all energy consumption for all occupied spaces.

Most agencies reduced energy consumption this fiscal year as compared to the previous fiscal year. In many cases, this was primarily attributed to lower occupancy rates in many commonwealth facilities due to a full year of the COVID-19 pandemic and many commonwealth employees teleworking. A few agencies had more significant energy reductions, such as, DGS, the Pennsylvania Emergency Management Agency (PEMA) and Department of Human Services (DHS). DGS had a combination of lower occupancy rates (teleworking employees), in conjunction with the DGS Annex facilities being permanently closed with those staff being relocated elsewhere, as well as continued Guaranteed Energy Savings Act or [GESA program](#) investments. PEMA also saw a large decrease from lower building occupancy where over half the staff were on telework schedules. PEMA replaced a portion of its lighting with LEDs and scheduled exhaust fans to run about half the time for energy conservation in partially occupied spaces. In addition, DHS had significantly reduced patient populations and visitors at state hospitals, as well as implementing planned closures of hospital facilities. DHS also improved efficiency in some buildings with updated temperature controls, air con-

ditioning units, and efforts to find and repair steam and water leaks and replace insulation.

A few agencies increased consumption during this reporting period, such as, DMVA and Agriculture. DMVA consumption increased largely due to a postponement of training exercises at Fort Indiantown Gap early during the pandemic (previous fiscal year), followed by a rescheduling of these training exercises in the reporting year. The Department of Agriculture's Farm Show building was temporarily used for pandemic emergency management as a hub to stockpile COVID-19 supplies. Other agencies, like DCNR and Fish & Boat, likely saw smaller increases due to the public's increased use of these facilities as Pennsylvanians were looking to participate in outdoor activities.

The [GESA program](#) has continued throughout the reporting year as a strategy to improve efficiency of facilities. GESA uses a progressive contracting process that enables mass upgrades of building components such as lighting, HVAC, water, etc. to be replaced through a budget neutral process. These upgrades reduce energy usage which result in decreased utility spending and



PEMA upgraded to LED lighting and reprogrammed HVAC equipment for energy conservation.

serve as a vehicle to decrease growing utility costs in commonwealth facilities. Table 2 shows recent GESA projects and the project status. A continued active portfolio of GESA projects will continue to drive down energy consumption and support the Executive Order energy savings goals. Visit [Energy Savings Performance Contracting through Pennsylvania's Guaranteed Energy Savings Act \(GESA\)](#) for more detailed information on the GESA program and its delivery in the commonwealth.

In this reporting year, the Capitol Complex, Department of Corrections (DOC) Muncy and Houtzdale facilities all completed constructed. In addition, the Department of

Conservation and Natural Resources (DCNR) completed construction on a regional project involving multiple facilities in the central portion of the state. These projects will all move onto the Measurement and Verification stage to monitor savings figures. The Department of Conservation and Natural Resources (DCNR) west region project, comprising various facilities in western Pennsylvania state parks and forests has completed construction, with Measurement and Verification currently underway. Additional GESA investments are at various stages of implementation within the Capitol Complex, PennDOT District 8, Fish and Boat Commission, and additional DOC facilities.

Table 2



**DGS GESA Projects
Delivery and Savings Summary 2021**

| Num. | Agency | Location | Project Description & Delivery | | | Annual Energy Savings* | | | Annual Environmental Benefits* | | | |
|----------------|--------|---------------------------------------|---|----------------------------|-------------------------------------|------------------------|-------------------|--------------------|--------------------------------|---------------|-----------------------|----------------|
| | | | Energy Conservation Measures (ECMs) | Status | Substantial Construction Completion | Value (M) | KWH | Dollars | Cars Mitigated | Trees Planted | Home Energy Use Saved | CO2 Tons Saved |
| 1 | DOC | SCI Dallas | Lighting, water, boiler & sewage | Completed | 7/1/2016 | \$20.00 | 2,137,857 | \$2,200,000 | 341 | 4,123 | 172 | 1,757 |
| 2 | PSP | Harrisburg Headquarters | Lighting, water & boiler | Completed | 2/1/2018 | \$5.10 | 2,849,225 | \$295,097 | 454 | 5,378 | 224 | 2,339 |
| 3 | DGS | Keystone Building | Lighting & controls | Completed | 1/23/2018 | \$3.00 | 2,403,190 | \$329,677 | 383 | 4,635 | 193 | 1,789 |
| 4 | PASSHE | Thaddeus Stevens College | Lighting, controls, steam | Measurement & Verification | 3/25/2019 | \$2.70 | 1,030,172 | \$137,305 | 190 | 2,301 | 96 | 979 |
| 5 | DCNR | West Region, Parks & Forests | Lighting & HVAC systems, building envelope | Measurement & Verification | 2/29/2020 | \$5.50 | 2,814,916 | \$375,182 | 436 | 5,282 | 220 | 2,247 |
| 6 | DHS | Selinsgrove Center | Lighting, water, boilers & weatherization | Measurement & Verification | 2/15/2020 | \$5.60 | 1,901,322 | \$253,415 | 395 | 4,784 | 199 | 2,035 |
| 7 | DGS | Capitol Complex | Lighting, window film, water systems, chillers | Construction | 2/29/2021 | \$18.20 | 9,003,360 | \$1,200,000 | 1,390 | 16,826 | 701 | 6,368 |
| 8 | DOC | SCI Muncy | Lighting, solar, steam traps, windows, AC, EMS s | Construction | 4/1/2021 | \$18.30 | 2,773,465 | \$469,904 | 424 | 3,242 | 226 | 2,162 |
| 9 | DOC | SCI Houtzdale | Lighting, water, HVAC | Construction | 11/30/2021 | \$30.50 | 4,293,351 | \$1,170,814 | 970 | 7,427 | 518 | 4,492 |
| 10 | DCNR | Central Region, Parks & Forests | Lighting, solar, sludge, BMS, electric to gas, geothermal | Construction | 11/30/2021 | \$16.40 | 2,135,128 | \$243,361 | 321 | 2,496 | 181 | 1,664 |
| 11 | DOT | District 8 Facility | Lighting, weatherization, water conservation, BAS upgrades, fuel switches on HWH, steam traps | Investment Grade Audit | 6/15/2022 | \$26.00 | TBD | TBD | TBD | TBD | TBD | TBD |
| 12 | DGS | DGS Capitol Complex 2 | Lighting, weatherization, BAS upgrades, HVAC upgrades/fuel switches, geothermal | Investment Grade Audit | 6/15/2022 | \$29.00 | TBD | TBD | TBD | TBD | TBD | TBD |
| 13 | FBC | Hatchery Facilities State-Wide | Lighting, weatherization, HVAC upgrades/fuel switches, water filtration & recovery | Financing | 6/15/2022 | \$5.90 | 1,787,616 | \$203,523 | 276 | 2,095 | 153 | 1,396 |
| 14 | DOC | SCI Fayette | Lighting, BAS, chiller, boiler, water conservation | Investment Grade Audit | 12/15/2022 | \$32.00 | TBD | TBD | TBD | TBD | TBD | TBD |
| 15 | DOC | SCI Frackville | Steam, steam traps, lighting, BAS, chiller, water conservation | Investment Grade Audit | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| 16 | DHS | Wemersville State Hospital | Lighting, controls, weatherization, steam traps, condensate, windows, boiler fuel switch | Scoring | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| 17 | DCNR | Eastern Region, State Parks & Forests | TBD | RFQ | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| Totals: | | | | | | \$218.20 | 33,129,602 | \$6,878,278 | 5,580 | 58,589 | 2,883 | 27,228 |

*Annual Savings & Benefits are Estimated

2.a. GreenGov Recommendations to Agencies

Each year, the GreenGov Council makes recommendations to commonwealth agencies based on opportunities that may support or enhance progress toward performance goals and sustainability initiatives. These recommendations may be new or a continuation (or expansion) of previous annual report recommendations. GreenGov Council recommendations may evolve over time based on new information, a changing landscape, or a deeper understanding of the issues and solutions. Building energy reduction recommendations are as follows:

- Utilize an energy management system for all commonwealth facilities, such as using U.S. Department of Energy’s [50001 Ready](#) program and develop a comprehensive energy management strategy that ensures continued and sustained energy efficiency investments. Energy management planning takes time to implement but will lead to long term and permanent operational savings, efficiencies, and deeper energy savings achievements.
- Capture facility square footage to determine Energy Use Intensity (EUI) figures (often expressed in thousands of British Thermal Units per square foot per year – kBtu/sf/yr). This type of metric is useful to compare building performance across the portfolio and supports executive-level reporting.
- Continue to identify GESA project opportunities, as a primary method to drive down energy costs without tapping into capital budgets.
- Integrate permanent telework options for employees, with a primary objective to consolidate operational space, that will lead to permanent energy and cost savings for the commonwealth.

Replace 25-percent of state passenger fleet with electric vehicles & reduce vehicle miles traveled

3. Passenger Fleet Electrification & Vehicle Miles Traveled

The number of vehicles in the commonwealth’s fleet fluctuates due to vehicle turnover and replacements,

therefore the goal of converting 25-percent of the state passenger fleet to electric vehicles by 2025 is reevaluated on an annual basis. DGS Bureau of Vehicle Management, PennDOT’s Bureau of Maintenance and Operations, and the PA Turnpike Commission agreed to use a consistent definition for “passenger vehicle” for the purposes of aligning data sets across agencies for a consistent fleet benchmarking of the transportation performance goal.

For reporting purposes, “passenger vehicle” is defined using Federal Highway Administration’s Vehicle Class 1 & 2. In addition, the passenger vehicle definition excludes pickup trucks and law enforcement vehicles.

Table 3 shows the commonwealth vehicle fleet in all Classes 1-8, compared to the defined “passenger vehicle” portion of the fleet. As of November 30, 2021, there were 4,180 passenger vehicles in the commonwealth

Table 3



**Commonwealth Agency Vehicle Fleet* - Counts, Consumption & Emissions
2020 vs. 2021 - Rolling Annual Report Ending on November 30th**

| Vehicle Classification | Total Vehicle Count | | Vehicle Miles Traveled | | Fuel Consumption (Gasoline & Diesel Gallons) | | Average Miles per Gallon | | Carbon Emissions (Metric Tons)** | |
|-------------------------------|---------------------|--------|------------------------|-------------|--|------------|--------------------------|-------|----------------------------------|---------|
| | 2020 | 2021 | 2020 | 2021 | 2020 | 2021 | 2020 | 2021 | 2020 | 2021 |
| All (Classes 1-8) | 20,940 | 21,015 | 214,495,509 | 239,368,929 | 17,231,008 | 20,188,061 | 12.45 | 11.86 | 153,132 | 179,411 |
| Passenger† (Class 1-2) | 4,204 | 4,180 | 48,070,127 | 52,674,806 | 1,712,478 | 1,926,828 | 28.07 | 27.34 | 15,219 | 17,124 |

* Rental vehicle & personal vehicle use not included

† Law enforcement vehicles & pickup trucks not included

** Electric vehicle carbon emissions not included

fleet. The electric vehicle goal was calculated based on 3,850 eligible vehicles. This sets our current goal at 963 vehicles by 2025.

Table 3 shows business fleet vehicle miles traveled (VMT), fuel consumption, average miles per gallon, and estimated carbon emissions for the commonwealth. The prior 2020 reporting year included the first eight months of the COVID-19 pandemic. During that time, there was a significant slowdown in business travel. In the 2021 reporting year, the COVID pandemic remained, however, agencies returned to more normal business travel. There was a rebound of about 24.9 million miles of business travel during the 2021 recovery. Of those miles about 4.6 million miles were from passenger vehicle travel, excluding pickup trucks and law enforcement vehicles.

Carbon emission increased by roughly twenty-six (26) thousand metric tons.

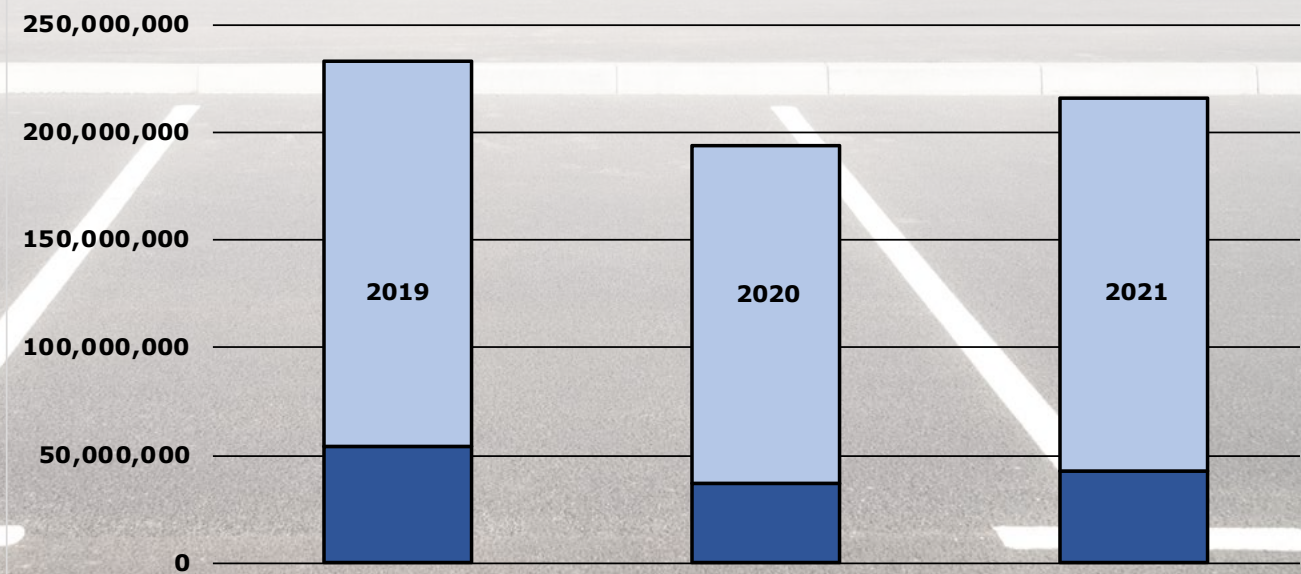
While there was a rebound effect that occurred in 2021, the total vehicle miles traveled (VMT) didn't fully recover to 2019 travel levels as indicated in Figure 1. This analysis shows total vehicle miles traveled over the three years of analysis as reported by DGS and PennDOT but excludes the Turnpike since they started reporting VMT in 2020. The rebound effect in 2021 was anticipated, however it remains promising that incremental VMT reductions remain achievable based on the commonwealth switching to virtual business solutions, where applicable. Continued and permanent VMT reductions are likely possible by identifying best practices and enacting new policies around business travel.

Figure 1



**Commonwealth Agency Vehicle Fleet*
Annual VMT Comparison**

| Vehicle Classification | Vehicle Miles Traveled | | |
|---|------------------------|--------------------|--------------------|
| Passenger** (Class 1-2) | 54,106,130 | 37,225,437 | 42,737,919 |
| All Remaining Vehicles (Through Class 8) | 179,175,867 | 156,825,842 | 173,480,605 |



* PA Turnpike fleet, rental & personal vehicle use not included
 ** Law enforcement vehicles & pickup trucks not included

Table 4

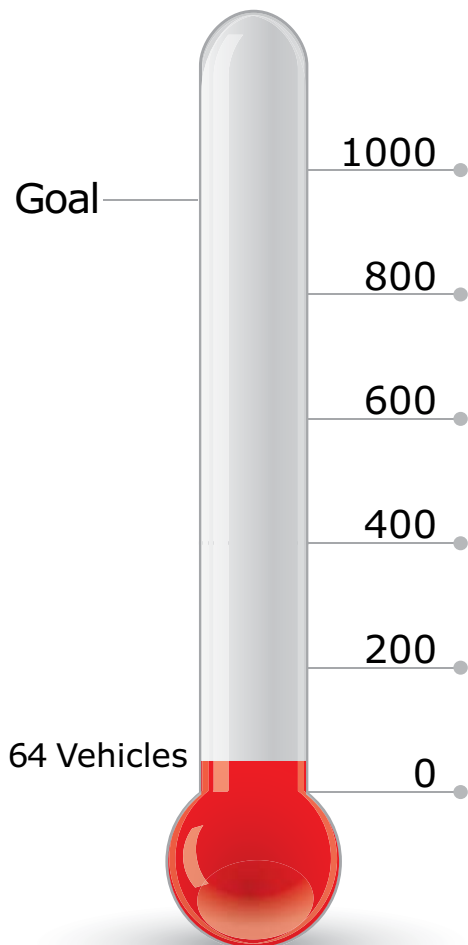


**Commonwealth Agency Electric Vehicle Fleet* & EV Charging Plugs
2020 vs. 2021 - Rolling Annual Report Ending on November 30th**

| Description | Equipment Type | Count 2020 | Count 2021 |
|--|--|------------|------------|
| Battery Electric Vehicles (BEVs) | Chevrolet Bolt, Ford Focus | 5 | 5 |
| Plug-In Hybrid Electric Vehicles (PHEVs) | Chevrolet Volt, Chrysler Pacifica, Ford Escape, Ford Fusion | 40 | 59 |
| Owned & Operated EV Charging Plugs | Level 2 Charging Plugs (240V) | 19 | 74 |
| 25% Electric Vehicle Goal (by 2025) | Battery Electric Vehicles (BEVs) Plug-In Hybrid Electric Vehicles (PHEVs) | 967 | 963 |

* PA Turnpike fleet not included

**Figure 2
Electrical Vehicle Goal Progress**



As of November 30, 2021, the commonwealth had 64 electric vehicles in the fleet, comprised of five battery electric vehicles and 59 plug-in hybrid vehicles (Table 4). An additional 19 electric vehicles were added to the fleet in 2021. DGS reported substantial procurement bottlenecks in the vehicle supply chain during this year. Many vehicle orders were pushed back due to vehicle manufacture microchip shortages and other supply chain issues.

2021 resulted in little progress in electric vehicle purchases and progress toward the performance goal. As indicated in Figure 2, the commonwealth is only 6.6-percent of its way to meeting the 2025 goal.



Figure 3

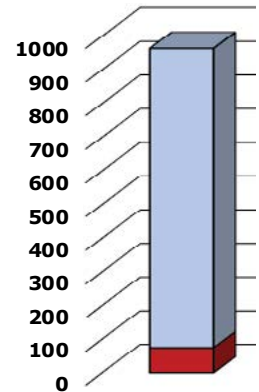
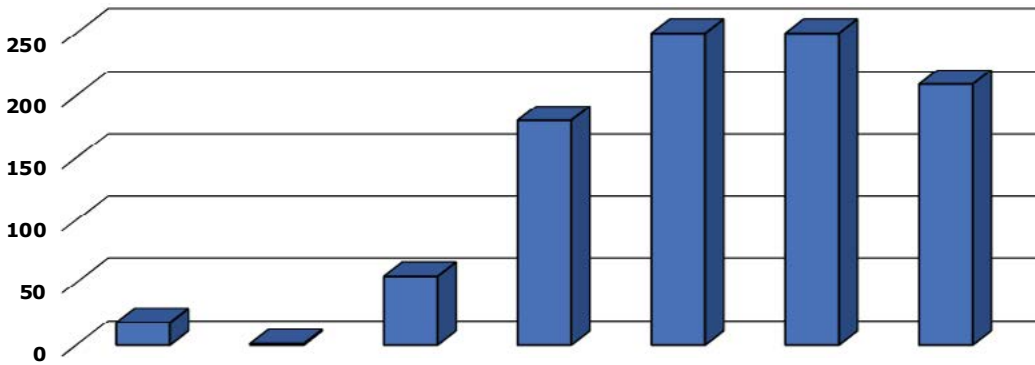


**Charging Plug Annual Delivery
Projected 963 Unit Goal**

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---------------------|-------|-------|-------|--------|--------|--------|------|
| Count | 18 | 1 | 55 | 180 | 250 | 250 | 209 |
| Percentage Complete | 1.87% | 1.97% | 7.68% | 26.38% | 52.34% | 78.30% | 100% |

**EV Plug
Delivery Status**

| Count | Percentage |
|-----------|------------|
| 74 of 963 | 7.68% |



However, the commonwealth has made some good progress toward the installation of level-2 charging plugs to support the future vehicles. We now have 74 available plugs, which is slightly ahead of the number of EVs in the fleet. Based on GreenGov projections in Figure 3, we will need to approximately triple the previous pace of charging station deliveries during 2022 to deliver the number of plugs needed by 2025. Even though, there is a potential for lagging electric vehicles due to ongoing supply constraints, moving forward with the charging station deployments will eliminate a significant barrier to EV adoption and prepare us for a larger bulk purchase of vehicles for model years 2023 and beyond.

Finally, the commonwealth has continued to make good progress adding clean vehicles to the state contract. DGS has increased available vehicle models on contract from 23 models (2020) to 36 models in 2021. The new additions include battery electric vehicles, conventional hybrids, and compressed natural gas options. Table 5 shows a summary of the low emissions vehicles currently available to procure for commonwealth agencies. It is imperative to continue to expand the offerings of vehicles on contract to provide options for agencies looking to select the best vehicle for the task. Additional options will also provide procurement flexibility.



DGS has increased available vehicle models on contract from 23 models (2020) to 36 models in 2021



Table 5



**Bureau of Vehicle Management
Low-Emission Vehicles on State Contract**

| Segment | Year | Make | Model | Fuel | Procurement |
|---------------------------------|------|-----------|---------------------------|-------------|-------------|
| Compact/Midsize Sedan (10) | 2022 | Chevrolet | Bolt EUV | BEV* | New** |
| | 2022 | Chevrolet | Bolt EV | BEV* | Carryover |
| | 2022 | Honda | Accord EX Hybrid | HEV | New** |
| | 2022 | Honda | Accord Hybrid | HEV | Carryover |
| | 2022 | Honda | Insight Hybrid | HEV | New** |
| | 2022 | Nissan | Leaf S | BEV* | New** |
| | 2022 | Nissan | Leaf S Plus | BEV* | New** |
| | 2022 | Nissan | Leaf SL Plus | BEV* | New** |
| | 2022 | Nissan | Leaf SV | BEV* | New** |
| | 2022 | Nissan | Leaf SV Plus | BEV* | New** |
| Small/Medium SUV (6) | 2022 | Ford | Escape 4dr | HEV | Carryover |
| | 2022 | Ford | Escape 4dr | PHEV* | Carryover |
| | 2022 | Ford | Mustang Mach-E 4dr | BEV* | New** |
| | 2022 | Honda | CR-V Hybrid | HEV | New** |
| | 2022 | Jeep | Wrangler 2-door eTorque | HEV | New** |
| | 2022 | Jeep | Wrangler 4-door eTorque | HEV | New** |
| Mini-Van (1) | 2022 | Chrysler | Pacifica Hybrid | PHEV* | Carryover |
| Large SUV (1) | 2022 | Ford | Explorer 4dr | HEV | Carryover |
| Light Duty Pickup Truck (8) | 2022 | Ford | F-150 Lightning SC | BEV* | New** |
| | 2022 | Ford | F-150 SuperCrew Hybrid | HEV | New** |
| | 2022 | Ford | F-250 Regular Cab XL | Gas,CNG,Pro | Carryover |
| | 2022 | Ford | F-250 SuperCrew XL | Gas,CNG,Pro | New** |
| | 2022 | Ford | Maverick SuperCrew | HEV | New** |
| | 2022 | Ram | 1500 Crew Cab eTorque | HEV | New** |
| | 2022 | Ram | 1500 Quad Cab eTorque | HEV | New** |
| | 2022 | Ram | 1500 Quad Cab HFE eTorque | HEV | Carryover |
| Medium Duty Pickup Truck (2) | 2022 | Ford | F-350 Regular Cab XL SRW | Gas,CNG,Pro | New** |
| | 2022 | Ford | F-350 SuperCrew XL SRW | Gas,CNG,Pro | New** |
| Cargo Van (3) | 2022 | Ford | E-TRANSIT 350 High Roof | BEV* | New** |
| | 2022 | Ford | E-TRANSIT 350 Low Roof | BEV* | New** |
| | 2022 | Ford | E-TRANSIT 350 Medium Roof | BEV* | New** |
| Chassis Cab Van (2) | 2022 | Ford | E-TRANSIT 350 | BEV* | New** |
| | 2022 | Ford | E-TRANSIT 350 SRW | BEV* | New** |
| Chassis Cab Truck (3) | 2022 | Ford | F-550 Regular Cab XL | Gas,CNG,Pro | New** |
| | 2022 | Ford | F-550 SuperCrew XL | Gas,CNG,Pro | New** |
| | 2022 | Ford | F-600 Regular Cab | Gas,CNG,Pro | New** |

* BEV & PHEV vehicles are specifically mandated within EO2019-01

** Vehicles are new additions to the state procurement contract

Note: 23 models available in 2020 to 36 models in 2021 = 57% increase

3.a. GreenGov Recommendations to Agencies

Each year, the GreenGov Council makes recommendations to commonwealth agencies based on opportunities that may support or enhance progress toward performance goals and sustainability initiatives. These recommendations may be new or a continuation (or expansion) of previous annual report recommendations. GreenGov Council recommendations may evolve over time based on new information, a changing landscape, or a deeper understanding of the issues and solutions. Transportation recommendations are as follows:

- Continue the expansion of Battery Electric Vehicles and Plug-in Hybrid Vehicles on state contract and continue to prioritize replacing vehicles with the most fuel-efficient vehicles available in each class, including electric or conventional hybrid electric vehicles.
- Assess workplace charging locations statewide and deliver charging stations aligned with the schedule proposed by GreenGov Council (Figure 3).
- Develop permanent vehicle miles traveled (VMT) reduction strategies based on lessons learned from maintaining business operations during the current COVID-19 pandemic. There are new ways to maintain a high-level of commonwealth services while traveling less.
- Educate and establish policies for commonwealth employee drivers on electric vehicle and charging station use.

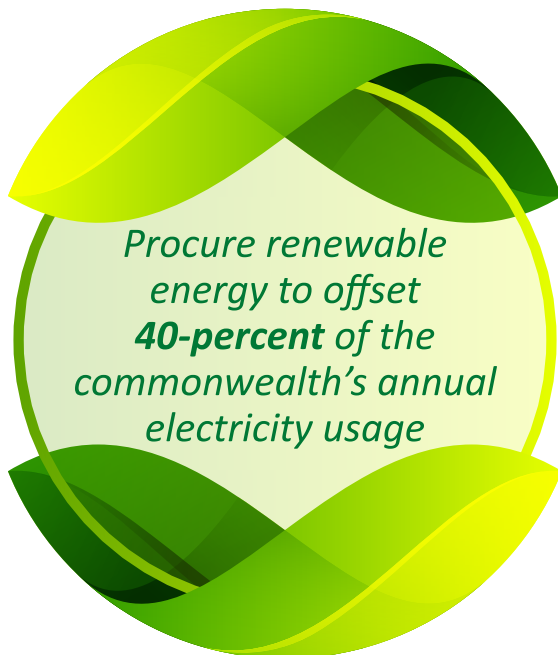
4. Energy Procurement & Renewable Energy Investments

DGS Bureau of Procurement procured [Green-e](#) certified Renewable Energy Credits (RECs) on behalf of commonwealth agencies for calendar year 2021. A total of 308,978 RECs were procured at a cost of \$228,644 offsetting 40-percent of the commonwealth's total electricity load for the year. The RECs are derived from nationwide certified renewable energy sources. These RECs serve to meet our com-

monwealth performance goal for renewable energy use requirements and rank the commonwealth at #49 on the U.S. EPA's Green Power Partnership National [Top 100 list](#).

In March 2021, Governor Wolf announced a new solar initiative called [Pennsylvania PULSE](#) (Project to Utilize Light and Solar Energy) that is intended to replace the Green-e certified REC purchases going forward. PA PULSE will create 191-megawatts of new solar to be constructed in Pennsylvania during 2022. The solar will cover about half of the state government's electricity usage starting on January 1, 2023. At the time of the announcement, this was the single largest procurement for solar made by any federal, state, or local government entity. PA PULSE is also significant, in that, it's a new retail electricity purchase model that leverages Pennsylvania's deregulated electricity utility market (established under Governor Tom Ridge in 1996) allowing for electricity shopping and customer choice.

Under PA PULSE, the commonwealth has contracted with Constellation Energy to provide "on-bill" solar on a 15-year fixed price contract for over four hundred electric utility accounts across sixteen state agencies. Lightsource bp will build, own, and operate the solar arrays and deliver approximately 361,000 megawatt-hours annually from the arrays. The Solar Renewable Energy Credits (SRECS) generated will be retired upon retail purchase by the commonwealth ensuring that the energy used by the 16 state agencies is 100-percent emissions free. PA PULSE will create 400-plus jobs and begin lowering carbon dioxide emissions statewide by 255,834 metric tons each year or the emission equivalent of the electricity use of roughly 30,808 average homes for a year.



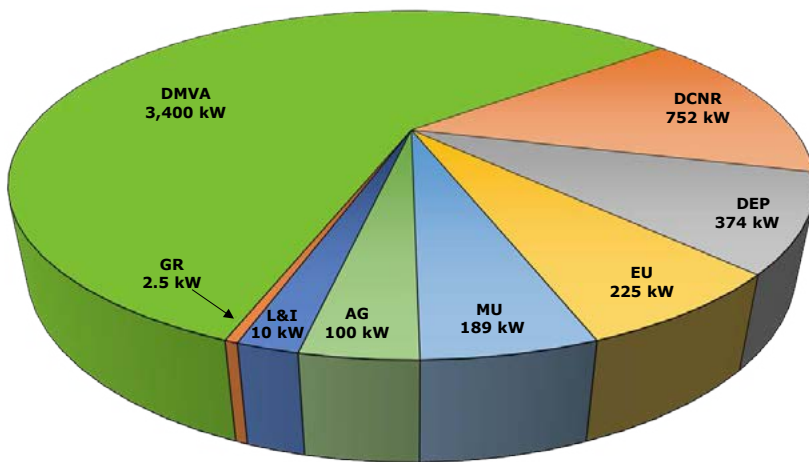
In addition, the commonwealth has solar installations generating onsite electricity that have been in service for the past several years. Figure 4 serves as a benchmark of these existing installations. In 2021, the Department of Conservation & Natural Resources (DCNR) installed a combined 281kW of new solar at Shikellamy State Park (33kW), Sproul Forest District (43kW), and Ryerson Station State Park (205kW).

Due to opportunities provided by an expanding solar market, the commonwealth will continue to pursue solar procurements within owned facilities in the coming years. Utilization of on-site renewable energy is cost-competitive in the market while providing long-term financial sustainability. Solar is becoming a simple solution to satisfy energy demands while helping to achieve our carbon reduction goals.

Figure 4



Commonwealth Existing Solar Installations - 2021



- Dept. of Military & Veteran's Affairs (DMVA)
- Dept. of Conservation & Natural Resources (DCNR)
- Dept. of Environmental Protection (DEP)
- Edinboro University (EU)
- Millersville University (MU)
- Dept. of Agriculture (AG)
- Dept. of Labor & Industry (L&I)
- Governor's Residence (GR)

Total Solar Capacity: 5,053 kW

4.a. GreenGov Recommendations to Agencies

Each year, the GreenGov Council makes recommendations to commonwealth agencies based on opportunities that may support or enhance progress toward performance goals and sustainability initiatives. These recommendations may be new or a continuation (or expansion) of previous annual report recommendations. GreenGov Council recommendations may evolve over time based on new information, a changing landscape, or a deeper understanding of the issues and solutions. Renewable energy investment recommendations are as follows:

- 🌿 Procure a new solar project on a commonwealth-owned facility using a Power Purchase Agreement (PPA) model. Use of a PPA is not a readily available tool for commonwealth agencies.
- 🌿 Collectively locate and benchmark 30-50 commonwealth-owned sites: identifying the best properties for solar investments.

- 🌿 Develop a comprehensive inspection and maintenance program for existing commonwealth solar installations.
- 🌿 Consider battery storage and/or microgrid options for energy resilience in critical facilities, such as hospitals, state correctional institutions, and military operations.



5. High Performance Buildings

Any new building construction, build-to-suit leased space, or renovation project that costs more than 50-percent of the estimated replacement cost must meet the Executive Order's high-performance standard. The high-performance standard is defined as achieving a 10-percent reduction in energy consumption as compared to the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ANSI/ASHRAE/IES) Standard 90.1.2016. This criterion essentially establishes a 10-percent efficiency increase over the 2018 International Energy Conservation Code (IECC) building code. Pennsylvania is currently implementing the 2015 (IECC) building code (except for the City of Philadelphia which is implementing the 2018 building code.)

The DGS Public Works Bureau of Pre-Construction and DCNR's Bureau of Facility Design and Construction have authority to construct new facilities for the commonwealth. In addition, the DGS Bureau of Real Estate oversees the management of commonwealth facility leases and lease renewals. These bureaus each have committed to pursue the high-performance standards, by incorporating the standards into contract provisions.

Commonwealth-owned and leased high-performance building projects are listed in Table 6. These projects are currently planned or under construction to incorporate (at a minimum) the 10-percent reduction in energy consumption over ANSI/ASHRAE/IES Standard 90.1.2016. Fourteen new high-performance construction or major renovation projects were added to the delivery queue this reporting year for a total of 30 to date and reflecting a nearly 100-percent increase in project volume. DCNR's Hickory Run State Park facility met U.S. Green Building Council LEED certification in 2021.

Build any new buildings, major renovations, build-to-suit leased buildings to high-performance building standards



Table 6



**Commonwealth-Owned High Performance Building Delivery
Projects Delivered, in Construction & Planned**

| Number | Agency | Project | Location | Delivery | Performance Goal | Square Footage | Value |
|--------|--|--|---|---|---|----------------|-----------|
| 1 | Department of Conservation & Natural Resources | Construct New Visitor Center and Office | Hickory Run State Park, Carbon County | Construction Complete 2020 | LEED Silver Certification | 13,300 | \$6.53 M |
| 2 | Game Commission | Replacement Regional Office Facility | South-Central Regional Office, Huntingdon County | Design 2020 Construct 2022 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | TBD | \$3.30 M |
| 3 | Department of Military & Veterans Affairs | Construct New Police Station Facility | Fort Indiantown Gap, Lebanon County | Design 2020 Construct 2022 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 6,000 | \$2.85 M |
| 4 | State System of Higher Education | Renovation of Baron-Fomess Library | Edinboro University, Erie County | Design 2020 Construct 2022 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 102,000 | \$13.30 M |
| 5 | State-Related Higher Education School | Renovation of Historic Vail Hall | Lincoln University, Chester County | Design 2020 Construct 2023 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 14,000 | \$12.00 M |
| 6 | Department of Military & Veterans Affairs | Readiness Center Rehabilitation | Plymouth Meeting Readiness Center & Horsham Air Guard Station | Design 2021 Construct 2022 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 8,000 | \$6.90 M |
| 7 | Department of Military & Veterans Affairs | Construct New Youth Challenge Multipurpose Bldg. | Fort Indiantown Gap, Lebanon County | Design 2021 Construct 2022 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 11,000 | \$5.30 M |
| 8 | State System of Higher Education | Facility Space Renovation/Demo | Clarion University | Design 2020/2021 Construct 2022 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 19,362 | \$4.86 M |
| 9 | State System of Higher Education | Cope Hall Additions and Renovations | Cheyney University Cope Hall | Design 2021 Construct 2022/2023 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 130,000 | \$37.40 M |
| 10 | Department of Conservation & Natural Resources | Construct New Resource Management Center | Delaware State Forest, Pike County | Design 2021 Construct 2023 | LEED Certification | 16,000 | \$7.00 M |
| 11 | Department of Conservation & Natural Resources | Construct New Park Office | Hills Creek State Park, Tioga County | Design 2022 Construct 2023 | LEED Certification | 6,000 | \$4.00 M |
| 12 | Department of Conservation & Natural Resources | Construct New Park Office | Marsh Creek State Park, Chester County | Design 2022 Construct 2023 | LEED Certification | 5,000 | \$2.90 M |
| 13 | Independent Higher Education School | Construct New Community Learning Center | Thaddeus Stevens College of Technology, Lancaster County | Design 2021/2022 Construct 2023 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 13,600 | \$6.80 M |
| 14 | Department of Military & Veterans Affairs | Combined Support Maintenance Shop (CSMS) | Coraopolis Air Guard Station Pittsburgh Airport | Design 2021/2022 Construct 2023 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 50,000 | \$23.00 M |
| 15 | State System of Higher Education | Sturzebecker Health and Science Center Addition | West Chester University | Design 2021/2022 Construct 2022/2023 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 209,000 | \$33.75 M |
| 16 | State System of Higher Education | Poplar House Renovation/Addition | Kutztown University | Design 2021/2022 Construct 2022/2023 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 14,520 | \$5.20 M |

| | | | | | | | |
|----|--|--|--|---|---|---------|------------|
| 17 | State System of Higher Education | McCormick Center Renovations | Bloomsburg University | Design 2021/2022 Construct 2022/2023 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 104,757 | \$19.52 M |
| 18 | State Police | Modernization | PA State Police Academy and BESO | Design 2021/2022 Construct 2022-2027 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 660,635 | \$190.00 M |
| 19 | Independent Higher Education School | New Multipurpose/Dorm Building | Thaddeus Stevens College of Technology, Lancaster County | Design 2021/2022 Construct 2023/2024 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 68,800 | \$21.00 M |
| 20 | State-Related Higher Education School | Renovations to Cresson Hall | Lincoln University, Chester County | Design 2021/2022 Construct 2023/2024 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 20,000 | \$16.00 M |
| 21 | Game Commission | New Pymatuning Wildlife Learning Center | Crawford County | Design 2021/2022 Construct 2023/2024 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 10,000+ | \$4.00 M |
| 22 | Game Commission | Headquarters Office Addition | Headquarters Building, Dauphin County | Design 2021/2022 Construct 2023/2024 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 13,560 | \$3.83 M |
| 23 | Department of Conservation & Natural Resources | Construct New Park Office | Keystone State Park, Westmoreland County | Design 2022 Construct 2023 | LEED Certification | 5,000 | \$2.80 M |
| 24 | Fish & Boat Commission | Office Addition | Fisheries management Office 9, Erie County | Design 2022 Construct 2023/2024 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 2,500 | \$1.00 M |
| 25 | Fish & Boat Commission | New Northeast Regional Office | Northeast Regional Office, Luzerne County | Design 2022 Construct 2023/2024 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 14,500 | \$4.00 M |
| 26 | Department of Conservation & Natural Resources | Construct New Park Office | Delaware State Forest, Pike County | Design 2022 Construct 2023/2024 | LEED Certification | 16,097 | \$7.00 M |
| 27 | Department of Conservation & Natural Resources | Replace Existing Marina Facilities | Maurice K. Goddard State Park, Mercer County | Design 2022 Construct 2023/2024 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 3,000 | \$2.40 M |
| 28 | Game Commission | New North Central Office Building | North Central Regional Office, Centre County | Design 2022/2023 Construct 2023/2024 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 16,000 | \$6.61 M |
| 29 | State-Related Higher Education School | Renovate Manuel Rivero Gym | Lincoln University, Chester County | Design 2022/2023 Construct 2023/2024 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 102,980 | \$25.00 M |
| 30 | Department of Conservation & Natural Resources | Construct New Resource Management Center | Gallitzin State Forest, Cambria County | Design TBD Construct TBD | LEED Certification | 14,800 | \$4.80 M |

Commonwealth-Leased High Performance Building Delivery

| Number | Agency | Project | Location | Delivery | Green Standard | Square Footage |
|--------|---|-------------------------------|--|----------------------------|---|----------------|
| 1 | Department of Human Services & Office of Administration | Build-to-Suit Office Building | 7th Street Harrisburg City, Dauphin County | Construction Complete 2021 | 10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016 | 120,000 |

In October 2018, DCNR broke ground on the new Hickory Run State Park Visitor Center and Office project in White Haven, Pennsylvania. The new visitor center and office replaces a late 1800s/early 1900s era remodeled home that previously served as the park office. The new facility houses Park administration staff, campground contact services, exhibit space and an educational/meeting room. Also provided are Environmental Education staff offices, Park Ranger offices and public restrooms. Exterior site improvements include a covered exterior education pavilion, expanded visitor parking including 13 RV/bus spaces and realignment of the campground road to improve traffic flow.

The completed visitor center and office opened to the public in October 2020 and earned its LEED Silver Certification in March 2021. Construction waste management diverted debris from landfills. Sustainable site features include native and adaptive plantings, rain gardens, electric vehicle charging stations and dark sky friendly shielded exterior lighting. The building has a high-performance thermal envelope, geothermal heating and cooling, natural daylighting, and user-demand lighting and plumbing controls. Low flow plumbing fixtures aid with the 51-percent potable water use reduction. LED lighting helps to reduce energy costs by 21-percent. Building components include low- or no-VOC emitting materials, recycled content materials and reclaimed wood.

Figure 5



The Department of General Services finalized new requirements for a High-Performance Lease Program. Commonwealth agencies will be able to pursue energy efficiency options in leases starting in 2022. The program will require all new or renewed leases for commonwealth office spaces over 20,000 square feet to complete an ASHRAE Level 1 or 2 energy audit, set energy reduction goals, invest in energy efficiency measures identified from the audit, and track performance through the term of the contract. Agencies are encouraged to identify leases that meet the pilot requirements and are ready for high-performance upgrades. This pilot program is a significant step, because the commonwealth occupies a large portfolio of lease space that is not accounted for within our Commonwealth Utility Benchmarking Initiative described in Section 2 of this report. This is occurring because many of our leases have utilities paid by the lessor, and not the commonwealth, so therefore do not appear in our energy and carbon tracking efforts. Energy savings and the associated greenhouse gas reductions opportunities are currently missed opportunities in many of these lease spaces. This high-performance lease pilot is a pathway to help solve the lessor/tenant arrangement which oftentimes restricts energy investment and upgrades to facilities. As part of leading-by-example, the commonwealth is seeking a portfolio of both owned and lease spaces over time meeting high performance and sustainable criteria. The GreenGov Council is looking forward to highlighting the carbon reduction achievements of our lessor community, as we work together to make these spaces more efficient, cost effective and sustainable.

5.a. GreenGov Recommendations to Agencies

Each year, the GreenGov Council makes recommendations to commonwealth agencies based on opportunities that may support or enhance progress toward performance goals and sustainability initiatives. These recommendations may be new or a continuation (or expansion) of previous annual report recommendations. GreenGov Council recommendations may evolve over time based on new information, a changing landscape, or a deeper understanding of the issues and solutions. High performance building recommendations are as follows:

- Focus on strategic planning that capitalizes on permanent energy and cost savings available to the commonwealth through new workspace consolidation opportunities created by the widespread implementation of full-time and part-time telework.
- Identify lease office spaces to pilot the new High-Performance Lease Program.
- Work with DGS Public Works to identify and design new construction projects that exceed the minimum high-performance standards. New buildings constructed today will be in operation in 2050, where we will need to achieve carbon emissions reductions 80-percent or greater from 2005 levels.
- Set forth the processes for the adequate funding of the highest level of high-performance components within new construction and/or major renovation construction projects for continued lifetime operational savings.

6. Agency Certification Checklist

The GreenGov Agency Certification Checklist (Checklist) was developed by GreenGov for the purpose of assessing agencies' progress delivering sustainability within government operations and achieving the performance goals for state agencies. Thirty-one commonwealth agencies completed the Checklist documenting their respective agency's sustainability activities during fiscal year 20/21. Agency Checklists are available on the GreenGov [website](#) for public review.

The Checklist is designed to help identify new opportunities for continuous improvement, and therefore is not

intended for agencies to achieve a perfect score. The percentages assigned to each agency are not indicative of "passing" or "failing" grades. In addition, each agency has differing opportunities and operational footprints compared to others. The Checklist is intended to show progress overtime across all agencies, and by each agency from one year to the next. The Checklist intends to steer agencies into recognizing business areas that may need support, enhancements, or consideration of new strategies to implement in future years. Figure 6 shows the overall Checklist score by agency for the fiscal year 2020-21. Agencies were scored based on "Points Applicable" to them.

Figure 6



GreenGov Checklist Agency Overall Scores - 2021

| State Agency | Points Applicable | Points Earned | Score | 0 20 40 60 80 100 |
|--|-------------------|---------------|-------|-------------------|
| Department of Corrections | 153 | 145 | 95% | |
| Turnpike Commission | 166 | 138 | 83% | |
| Pennsylvania Milk Marketing Board | 52 | 42 | 81% | |
| Department of Banking and Securities | 103 | 83 | 81% | |
| Office of Administration | 54 | 43 | 80% | |
| Department of Transportation | 175 | 127 | 73% | |
| Dept. of Military and Veterans Affairs | 168 | 120 | 71% | |
| Pennsylvania State Police | 160 | 113 | 71% | |
| Dept. of Conservation and Nat. Res. | 178 | 121 | 68% | |
| Office of the Budget | 40 | 27 | 68% | |
| Historical and Museum Commission | 164 | 108 | 66% | |
| Department of Environmental Protection | 180 | 119 | 66% | |
| Department of Human Services | 180 | 119 | 66% | |
| Department of Labor and Industry | 171 | 109 | 64% | |
| Department of State | 128 | 78 | 61% | |
| Dept. of Drug and Alcohol Programs | 80 | 49 | 61% | |
| Dept. of Comm. and Economic Dev. | 56 | 32 | 57% | |
| State Fire commission | 177 | 98 | 55% | |
| PA Emergency Management Agency | 180 | 97 | 54% | |
| Pennsylvania Insurance Department | 78 | 39 | 50% | |
| Department of General Services | 180 | 90 | 50% | |
| Office of General Council | 82 | 41 | 50% | |
| Department of Education | 52 | 26 | 50% | |
| Public Utility Commission | 110 | 54 | 49% | |
| Department of Health | 147 | 70 | 48% | |
| Department of Aging | 82 | 38 | 46% | |
| Department of Revenue | 112 | 50 | 45% | |
| Office of State Inspector General | 73 | 31 | 42% | |
| Pennsylvania Game Commission | 174 | 64 | 37% | |
| Liquor Control Board | 176 | 64 | 36% | |
| Department of Agriculture | 180 | 34 | 19% | |

In addition, Figure 7 shows the GreenGov Agency Checklist categories and the average scores by Checklist category across all agencies. The figure shows progress in the Transportation & Resilience categories with slightly lower but similar performance to previous years in others. This year-to-year comparison is not exact though as the Checklist has been expanded for 2021. Differences include adding six new four-point measures along with the adjustment

of several other measures making them more difficult to attain. These changes have resulted in an overall gain of 26 additional points available, and the categories are summarized further below.

- The **Benchmarking & Evaluation** checklist category has remained the same with a slight decrease of 2-percent in performance for 2021. This measured

decrease is mostly attributed to the expansion of the category by roughly 19-percent with the addition of two four-point measures for a total of three available for 2021. Specific areas of focus include the development of agency space consolidation plans and partnership in the High-Performance Lease Initiative.

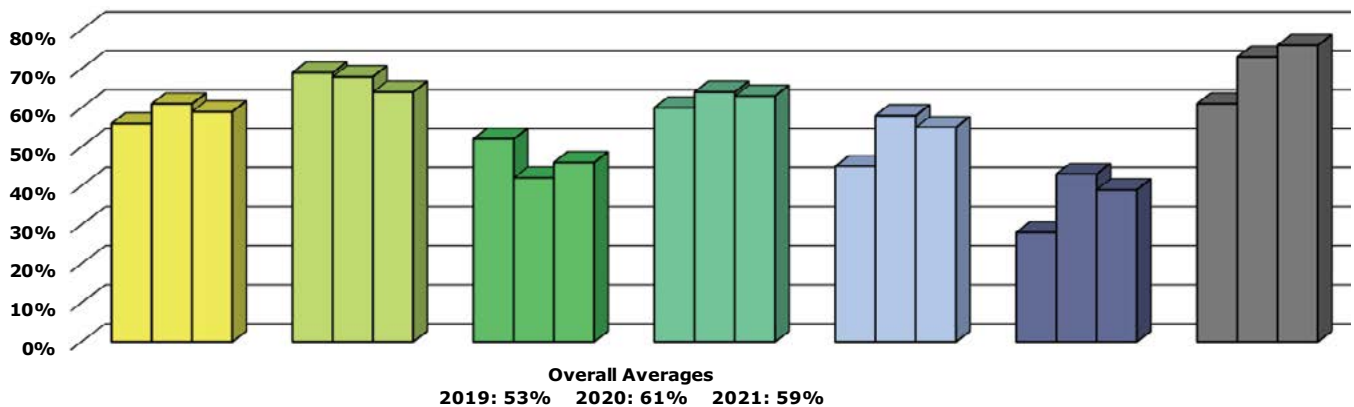
- The **Building & Structures** checklist category has a measured 4-percent performance decrease for 2021, from 68-percent to 64-percent. This decrease is the resultant of additional measures added to the category including a new four-point measure as well as tighter scoring criteria within several measures making them more difficult to attain. The category places greater focus on the reduction of energy use in facilities and more incentive for the delivery of high-performance construction projects.
- The **Transportation** checklist category has a 4-percent increase in performance compared to last year with the gain mostly attributed to the additional agency efforts regarding the development of high-efficiency vehicle plans and the development of electric vehicle infrastructure. The Transportation category has gained two for-point measures for 2021 increasing fleet efficiency opportunities for agencies.
- The **Products & Materials** checklist category has remained the same for 2021 with a 1-percent decrease

in performance. This maintaining of a similar year-to-year score is viewed as a win due to tighter scoring criteria within several measures making them more difficult to attain. Specific areas of expansion include Environmentally Preferred Procurements and agency participation in recycling programs.

- The **Culture** checklist category has a 3-percent decrease in performance this year and is attributed to, like other categories for 2021, tighter scoring criteria within several measures making them more difficult to attain. Specific areas of expansion include the development of Agency Sustainability Teams and implementation of training programs regarding energy use, sustainability, and climate adaptation.
- The **Renewable Energy** checklist category has a 4-percent decrease in performance this year. Though the scoring criteria for the category has remained unchanged from 2020, the overall decrease in performance is attributed to a slight reduction in the delivery of new renewable energy projects to support agency operations.
- The **Resilience** checklist category has a 3-percent increase in performance this year that largely attributed to, and is the result of, the increased implementation and maintaining of home-headquartered agency work options as well as increases in agency and employee communication regarding health, natural disaster, and environmental threats.

Figure 7 Average Agency Checklist Scores by Category - 2019, 2020 & 2021

| Category | Benchmarking & Evaluation | | | Buildings & Structures | | | Transportation | | | Products & Materials | | | Culture | | | Renewable Energy | | | Resilience | | |
|------------|---------------------------|------|------|------------------------|------|------|----------------|------|------|----------------------|------|------|---------|------|------|------------------|------|------|------------|------|------|
| | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 |
| Percentage | 56% | 61% | 59% | 69% | 68% | 64% | 52% | 42% | 46% | 60% | 64% | 63% | 45% | 58% | 55% | 28% | 43% | 39% | 61% | 73% | 76% |



Agencies are responsible for the development of policies and strategies to achieve performance goals

All commonwealth agencies are responsible for the development of policies and strategies to achieve the performance goals, and to seek to advance their Checklist results overtime. Agencies are tasked with working

collaboratively with the GreenGov Council and other agencies to identify and implement new conservation, sustainability, and efficiency strategies to support their business areas. Table 7 is a roll-up of the ten four-point measures available in the 2021 GreenGov Agency Certification Checklist, up from a total of four four-point measures available in 2020. The six additional four-point measures are a direct reflection of GreenGov initiatives to increase agency performance in the savings of energy, dollars, and carbon footprint. Additionally, these measures are actively being discussed within their corresponding GreenGov Focus Groups to explore ways for their adoption and/or to overcome barriers leading to greater agency successes. The GreenGov Recommendations to Agencies (Section 6.a) identifies top opportunities available for most agencies to improve in 2022.

Table 7



**GreenGov Checklist 2021
Four-Point Measures (10)**

| Category | Program Area | Item | Conservation Measure | Average Score |
|---------------------------|-----------------------|------|--|---------------|
| Benchmarking & Evaluation | Facility Benchmarking | 1B | Developed a written plan for your space portfolio to identify opportunities for consolidation of space leading to cost, energy and carbon footprint savings? | 44% |
| | Facility Benchmarking | 1F | Participated in the High-Performance Lease Program through partnership with DGS Bureau of Real Estate, GreenGov and lessor by conducting an energy audit and establishing energy efficiency goals? | 25% |
| | Facility Benchmarking | 1I | Achieved an overall 3% reduction of energy consumption within the past Fiscal Year (2020-2021) as per Executive Order 2019-01 through the participation in energy reduction programs and projects? | 79% |
| Buildings & Structures | High-Perf. Buildings | 7B | Achieved a measurable 10% reduction in energy consumption over ANSI/ASHRAE/IES Standard 90.1.2016 for any project (and/or achieved certification(s) including LEED, EnergyStar, etc.)? | 44% |
| | High-Perf. Buildings | 7C | Partnered with Public Works for the planning and/or delivery of a Sustainable high-performance new construction and/or facility renovation project with performance that exceeds ANSI/ASHRAE/IES Standard 90.1.2016? | 43% |
| Transportation | Vehicle Efficiency | 9A | Established a high-efficiency vehicle fleet plan including the purchase of battery electric and/or plug-in hybrid vehicle(s) and supporting infrastructure (charging stations) to achieve the 25% fleet goal? | 38% |
| | Vehicle Efficiency | 9C | Installed 50% additional electric vehicle charging stations to support your high-efficiency vehicle fleet plan (or enough to support 25% of your total passenger fleet)? | 5% |
| | Vehicle Efficiency | 9H | Permanently returned a vehicle(s) to DGS Bureau of Vehicle Management resulting in a smaller, therefore more efficient overall fleet? (turned in fixed asset tag) | 56% |
| Renewable Energy | On-Site Renewables | 16B | Delivered new large scale renewable energy project(s) at facility(s) equal to or greater than the 3 megawatt net metering threshold (through partnership with DGS or other)? | 13% |
| Resilience | Transportation | 18A | Implemented home-headquarter work options for staff that result in permanent reductions in carbon footprint associated with travel? | 94% |

6.a. GreenGov Recommendations to Agencies

Each year, the GreenGov Council makes recommendations to commonwealth agencies based on opportunities that may support or enhance progress toward performance goals and sustainability initiatives. These recommendations may be new or a continuation (or expansion) of previous annual report recommendations. GreenGov Council recommendations may evolve over time based on new information, a changing landscape, or a deeper understanding of the issues and solutions. Commonwealth agency checklist improvements recommendations are as follows

- Develop comprehensive agency plans for the consolidation of space as a direct result of the successes realized through home-headquartered agency work options and that will result in the savings of energy, dollars, and carbon footprint.
- For commonwealth agencies that occupy lease spaces, participate in the High-Performance Lease Program by working with lessors to benchmark historic facility energy demands and deliver energy-saving projects directly leading to reductions in facility costs and carbon emissions.
- Partner with DGS Public Works for the delivery of the most efficient, highest performing new construction and major renovation facility projects possible. These efforts lead directly to dramatically reduced facility operational costs and less demand on carbon-based resources through their service life.
- Install electric vehicle charging stations in preparation for vehicle electrification. Additionally, work on agency-wide, High-Efficiency Vehicle Fleet Plans to successfully meet the commonwealth's collective goal of 963 electric vehicles by 2025.
- Continue to pursue and deliver large-scale renewable energy projects that directly attribute to the greater sustainability of agencies by securing competitive energy pricing and reducing carbon footprint.

"I encourage all units of government and Pennsylvania businesses to set goals and develop strategies for comprehensive space consolidation and efficient business travel."

– Governor Tom Wolf

7. GreenGov Focus Group Highlights

The GreenGov Focus groups are interagency working groups that meet, develop, and implement action plans to improve sustainability of commonwealth operations and support the performance goals. The focus groups generally meet on a quarterly schedule throughout the year. Throughout 2021, focus group meetings were well-attended and supported by commonwealth agencies. A summary of each focus group and a brief outline of the primary items identified for the workplans are described in Table 8.

The commonwealth has made specific progress on various tasks which will lead to fulfilling the objectives of each group. The 2021 highlights from each focus group include:

- The **Utility Management Focus Group** developed

a workplan and set initial goals for achieving a comprehensive utility management in the commonwealth. The focus group defined and assigned roles for staff working with the EnergyCAP system and continued to utilize training support offered by PSFEI. In the second half of the year, the group started working toward quarterly reporting strategies that can be shared throughout an agency to encourage discussions about energy use within the agency. Going forward, a key goal for the group is to upload gross building square footage into EnergyCAP, so that Energy Use Intensity (EUI) analysis can be examined at the facility level.

- The **EV's & EV Charging Focus Group** spent a significant portion of its time discussing electric

Table 8



GreenGov Program - Agency Focus Groups

| Utility Management | |
|--|--|
| Focus Group Summary | Group Workplan |
| The Utility Management group is working to utilize the EnergyCAP system to track & benchmark utilities, develop agency energy portfolios and create standardized utility use reports to identify energy usage and cost savings. | <ul style="list-style-type: none"> • Utility Benchmarking & Data Analysis • 2022 EnergyCAP Agency Workplan & Training • EnergyCAP Phase 2 - Additional Utilities |
| EVs & EV Charging | |
| Focus Group Summary | Group Workplan |
| The EV and EV Charging group is assessing agency vehicle fleets and identifying opportunities for electrification. The group has worked to develop plans, specifications & locations for new charging station projects. | <ul style="list-style-type: none"> • EV Charging Project Planning & Delivery • EV Charging Equipment Selection • EVs on Contract & Agency Procurements |
| Construction & Leasing Specs | |
| Focus Group Summary | Group Workplan |
| The Construction & Leasing Specs group is working to develop, evaluate and include energy-saving specifications, techniques and goals within Commonwealth construction projects and lease agreements through agency & public collaboration. | <ul style="list-style-type: none"> • Development of High-Performance Building Goals • Implementation of High-Performance Lease Program • Development of Facility Delivery Guide |
| Products & Materials | |
| Focus Group Summary | Group Workplan |
| The Products & Materials group is developing an enhanced standardized recycling plan to be implemented in facilities state-wide and includes pilot programs as well as employee participation and education components. | <ul style="list-style-type: none"> • Recycling Kiosks Program Rollout • Employee Messaging & Education • Expanded Environmentally Preferred Products |
| Green Facility Management | |
| Focus Group Summary | Group Workplan |
| The Green Facility Management group is working to foster communications between facility managers, lift up best practices for high-performance building portfolios, and continue on the messaging strategies and delivery of the GESA program. | <ul style="list-style-type: none"> • Facilities Management Teams Communication • GESA Program Best Practices & Messaging • High-Performance Building Portfolio Best Practices |
| Sustainability Teams | |
| Focus Group Summary | Group Workplan |
| The Small Agency Operations group is working to develop Agency Sustainability Team models & policies, create employee and public engagement messaging templates and to identify reduction & consolidation business strategies. | <ul style="list-style-type: none"> • Sustainability Teams & Policy Agency Models • Employee & Public Messaging Templates • Identification of Reduction Strategies |

vehicle charging station siting and deployment opportunities. For electric vehicles to be successful in the commonwealth, we have a continuous need for charging station build-out. As indicated in Section 3, agencies did make progress toward our charging station delivery goal. Much more work is needed on station deployment and will continue to be a large part of the conversations. As electric vehicles enter the fleet, we need to move toward creating education (and use policies) for commonwealth EV drivers. Drivers who are not familiar with electric vehicles may choose traditional vehicles for their business routes, and we anticipate a need to create educational opportunities to support the transition.

- The **Construction & Leasing Specs Focus Group** supported the finalization of a high-performance lease exhibit that will be available to commonwealth agencies in 2022. In 2021, agency representatives coordinated efforts for three energy audits within existing lease facilities. Some members of the group participated in the actual audits and the review of energy audit recommendations. That process was instrumental for the completion of the lease exhibit language that was finalized later in the year. In 2022, we will be

looking forward to the first lease facilities working through the High-Performance Lease Program. For our construction projects, the Department of General Services staff continue to investigate sustainability guidelines that can be applied to the commonwealth's new construction portfolio. In 2022, we are looking to finalize these guidelines for use in 2023.

- The **Products & Materials Focus Group** deployed its first recycling kiosk in the North Office Building within the Capitol Complex. The kiosk is a central location for office recycling and contains educational messages and other important information on recycling for occupants and visitors. A group goal is to expand the kiosks to other state office buildings in the commonwealth after a successful pilot. The group also had planned attempts to visit successful organics recycling facilities in the commonwealth, however, COVID-19 caused rescheduling and delays with these events. We would like to revisit these organics discussions for opportunities in 2022. The group continues to discuss ways to enhance green product designations and encourage agencies to shop for greener products through [E-Market Place](#). Product procurement continues to be an important point of



discussion since the commonwealth is a large purchaser of many products and has a mechanism that supports local governments procurements via the COSTARS program.

- The **Green Facility Management Focus Group** has helped usher in the revised [Management Directive 720.05](#) on Energy Management and Conservation in Commonwealth-owned and Leased Facilities. The Management Directive was last update in 2008 and needed to be modernized to reflect current business practices. The new management directive was published on September 21, 2021. This focus group provides facility management staff in the commonwealth the opportunity to share best practices. In 2021, we had discussions on enhanced management of facilities pertaining to COVID-19. In 2022, we would like to explore more energy management planning - through strategic planning and goal setting.
- The **Sustainability Teams Focus Group** supported the first ever [Sustainability Week](#) in the commonwealth. Sustainability Week occurred on October 4-8. Daily messages were e-mailed to all commonwealth employees. Employees were encouraged to register a sustainability event or action. The group will be looking to continue these efforts to promote sustainability in 2022. With the finalization of Management Directive 720.05, the directive includes agencies creation of sustainability teams. In 2022, the group will support sustainability team development in agencies of the commonwealth.

These focus groups are not open to the public. The GreenGov Council may seek some outside help or support, wherever needed. Any outcomes, results, or needs will be shared in future public stakeholder meetings as a component of public engagement. Interested public should visit the GreenGov [website](#) for more information on upcoming meetings, or request to join our e-mail distribution list by sending a request to GSGreenGov@pa.gov.

8. Conclusion

The GreenGov Council thanks agencies for three years of program participation and the many successful steps that are leading to achieving the performance goals. Agencies are making a measurable difference improving sustainability in commonwealth business operations. We hope that this report provides a fair assessment and reflection of our progress in 2021 toward the goals and are looking forward to continued collaboration in 2022 and beyond.

Additionally, we thank our external partners and stakeholders for their continued collaboration in the GreenGov program through the sharing of new ideas and support of our goals. Through this network of dedicated partners, we have been able to enhance sustainability within our operations and realize reductions in greenhouse gas emissions statewide.



Notes





Photos of Commonwealth owned buildings provided by:

[Mike Twigg](#)
[Matthew Reis](#)





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