



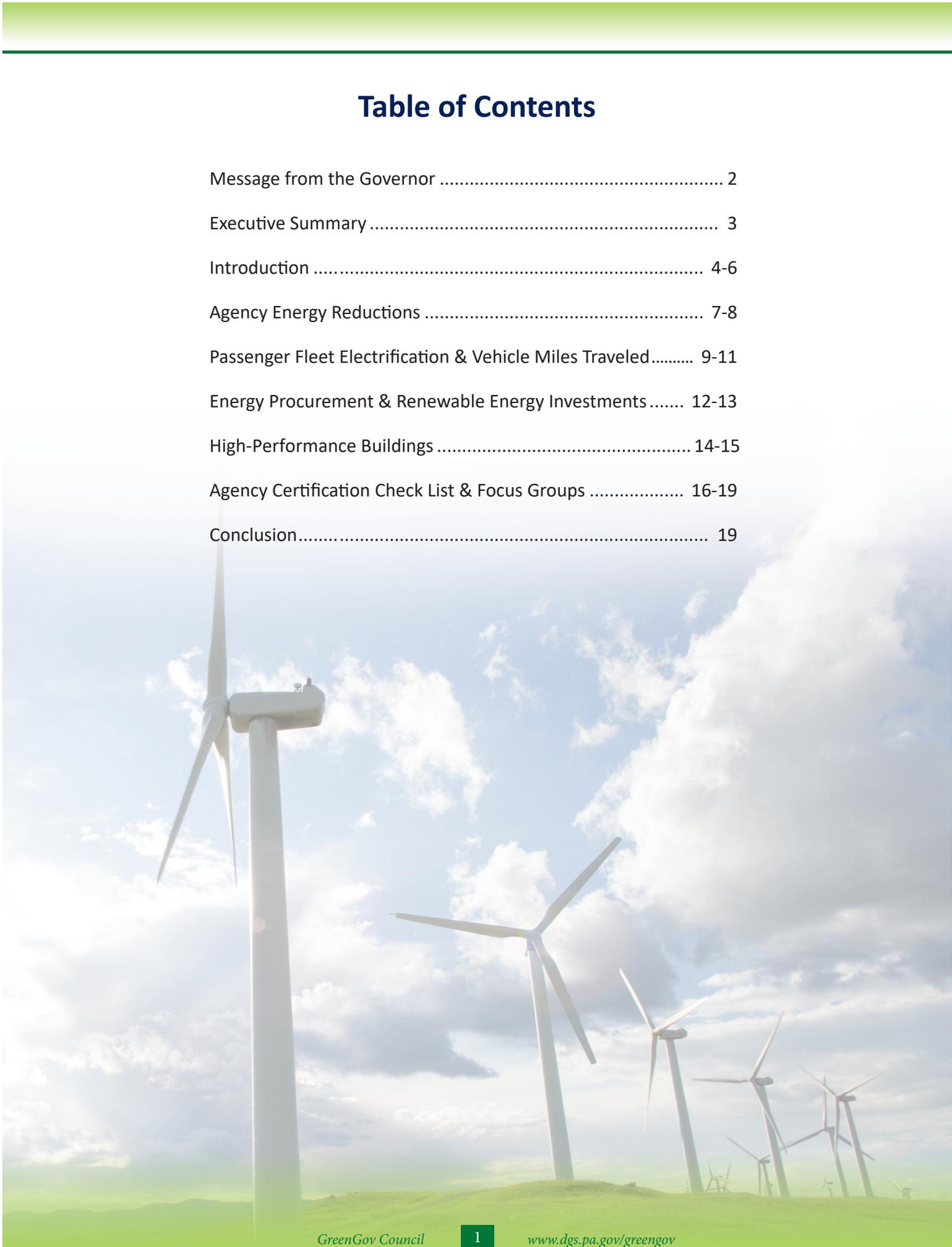
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GREENGOV COUNCIL

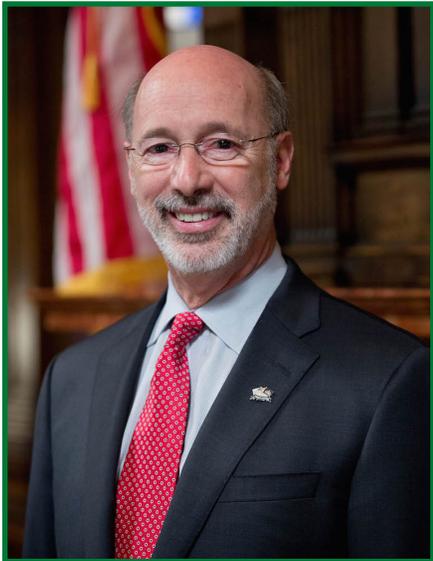
2019
Annual
Report



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Message from Governor Tom Wolf

Climate change is the most critical environmental threat to our world today. The scientific consensus is the planet is experiencing climate change with accelerated changes in real time, and the effects are felt everywhere. In 2015, the Pennsylvania Climate Impacts Assessment Update found that Pennsylvania has undergone a long-term warming over the prior 110 years. Due to these warming trends, Pennsylvania temperatures are expected to increase at an accelerated rate with average temperatures rising an additional 5.4 degrees by 2050. Average annual precipitation has also increased by approximately 10 percent over the past 100 years and by 2050 is expected to increase by an additional 8 percent.

In 2019, I signed two Executive Orders addressing climate change. [Executive Order 2019-01](#) sets a goal of a 26 percent reduction in net greenhouse gas emissions by 2025 and an 80% reduction by 2050, from 2005 levels.

This Executive Order established the GreenGov Council and requires commonwealth agencies to lead-by-example. [Executive Order 2019-07](#) instructs the Department of Environmental Protection to join the Regional Greenhouse Gas Initiative (RGGI), a market-based collaboration among nine Northeast and Mid-Atlantic states to reduce emissions and generate economic growth in the power generation sector. These Executive Orders align with goals and strategies of 25 Governors who joined the [U.S. Climate Alliance](#) in support of the global greenhouse gas reduction agreements.

This report documents the first year of progress made by commonwealth agencies on [Executive Order 2019-01](#), *Commonwealth Leadership in Addressing Climate Change and Promoting Energy Conservation and Sustainable Governance*. Commonwealth agencies understand that if we want to support important changes in Pennsylvania (and globally), we must also strive to lead the change. Commonwealth agencies worked to achieve a 2.9% reduction in energy use, purchased 40% renewable energy credits, established electric vehicle implementation goals, and began to incorporate high-performance design into new construction and major renovations.

In 2019, I hired the inaugural director, Mark Hand, and assistant director, Matthew Reis, to the GreenGov Council to begin working with all commonwealth agencies. Shifting commonwealth practices toward environmental sustainability is not an easy undertaking, and one that needs continuous improvement and adjustments in business practices and policy. However, the changes are necessary. I thank agencies for their efforts in 2019, and I'm looking forward to seeing progress that can be made in 2020 and beyond.

A handwritten signature in black ink that reads "Tom Wolf". The signature is fluid and cursive, with the first letters of "Tom" and "Wolf" being capitalized and prominent.

Tom Wolf
Governor



Executive Summary

The GreenGov Council is pleased to provide the first annual report in support of Governor Wolf's [Executive Order 2019-01](#) on *Commonwealth Leadership in Addressing Climate Change and Promoting Energy Conservation and Sustainable Governance*. On January 8, 2019, Governor Wolf signed the Executive Order which established the first ever statewide goal to reduce carbon pollution, and to empower commonwealth agencies to lead-by-example in support of this effort.

The report is intended to provide an annual benchmark measurement of Executive Order goals, summarize achievements to date, and provide recommendations to commonwealth agencies for 2020 and beyond.

The commonwealth has made some early progress on the Executive Order. Highlights include:

- The commonwealth Utility Benchmarking Initiative has expanded its reporting to 5,170 (61-percent) of energy meters in commonwealth facilities statewide. These facilities are showing a 2.9-percent energy reduction from the previous year and saving over \$1 million.
- The commonwealth procured 308,978 MWhs of Renewable Energy Credits (RECs) for 2019, offsetting 40-percent of the commonwealth's total electricity load for the year. This purchase ranks the commonwealth #35 on the U.S. EPA's Green Power Partnership National [Top 100 list](#).
- The commonwealth has established a goal of 990 electric vehicles (EVs) by 2025. A total of 53 EVs are currently available in the fleet, with plans to expand.
- Twelve new buildings or major renovations projects are incorporating the Executive Order's high performance building criteria into design and construction.

The GreenGov Council, which is co-chaired by the departments of General Services, Environmental Protection, and Conservation and Natural Resources has created the GreenGov Agency Certification Checklist (Checklist), which is a first of its kind evaluation tool for state agencies. The report summarizes the use of the Checklist and plans for additional work and focus areas identified for 2020.



1. Introduction

On January 8, 2019, Governor Wolf signed [Executive Order 2019-01](#) on *Commonwealth Leadership in Addressing Climate Change and Promoting Energy Conservation and Sustainable Governance*. The Executive Order requires agencies under the Governor's jurisdiction to lead-by-example and participate in Pennsylvania's climate goal of reducing net greenhouse gas emissions 26-percent by 2025, and an 80-percent by 2050 (from 2005 levels). The Executive Order's goals and framework intend to create accountability and accelerate policies in state government to reduce carbon pollution. The Executive Order aligns with goals and strategies of 25 Governors (including Governor Wolf) that joined the [U.S. Climate Alliance](#) in support of the global greenhouse gas reduction agreements.

***Pennsylvania's climate goal:
26-percent reduction of net
greenhouse gas emissions
statewide by 2025, and
an 80-percent reduction
by 2050***

In addition, [Executive Order 2019-01](#) established a GreenGov Council co-chaired by the Secretaries of the Departments of General Services, Environmental Protection, and Conservation and Natural Resources. The GreenGov Council encourages the incorporation of environmentally sustainable practices into the commonwealth's policy, planning, operations, procurement, and regulatory functions. With the hiring of inaugural Director Mark Hand in July 2019, the GreenGov Council staff began working with agencies on implementation of the goals established in the Executive Order.

The GreenGov Council is responsible for reporting the commonwealth's progress on the Executive Order's "Performance Goals for State Agencies." The performance goals are intended to be the foundation, by which commonwealth agencies strive to support the ambitious climate goals created for Pennsylvania. The *Performance Goals for State Agencies* are as follows:

- Reduce overall energy consumption by 3-percent per year by 2025 (from 2017 levels);
- 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 2019 GreenGov Annual Report serves as a summary of the commonwealth's progress toward meeting the *Performance Goals for State Agencies*, as well as, steps taken by the GreenGov Council and partnering agencies that form the basis of a GreenGov sustainability program. The GreenGov Council is using several tools to inform progress and demonstrate accountability. These methods will continue to be developed, improved, and expanded over time to create a more robust understanding of the commonwealth's carbon footprint, and explore new pathways forward for increasing environmentally sustainable operations. The practice of benchmarking is key to accountability. It's commonly said that "You can't manage what you don't measure." A brief description of GreenGov benchmarking tools and strategies are described below.

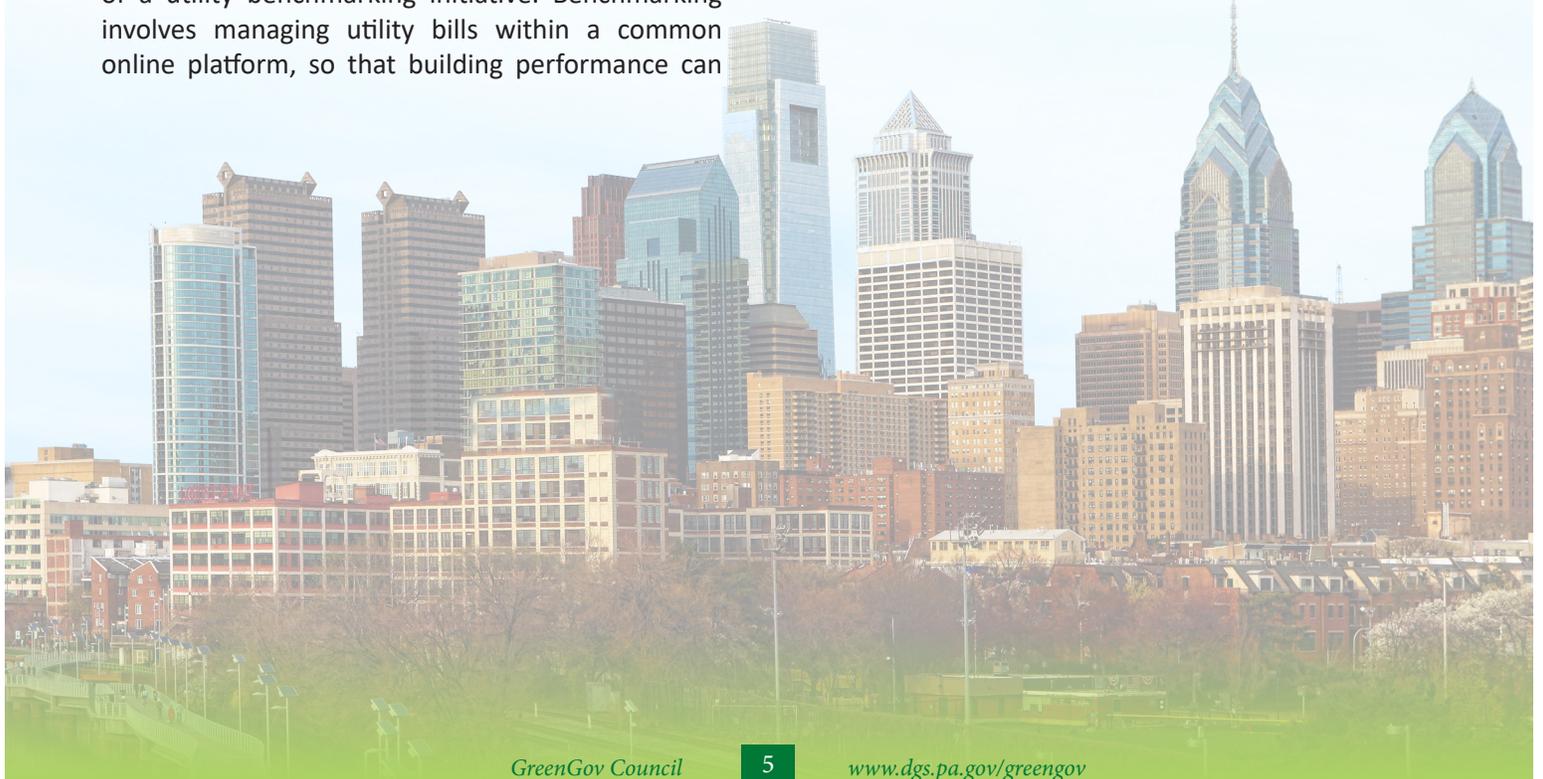
"You can't manage what you don't measure"

A.) Commonwealth Utility Benchmarking Initiative: In early 2018, the commonwealth began the delivery of a utility benchmarking initiative. Benchmarking involves managing utility bills within a common online platform, so that building performance can

be tracked over time. Tracking building performance leads to uncovering cost savings opportunities, which may otherwise remain hidden to financial and facilities decision makers. Elite organizations across the U.S. take this strategic approach to energy management. The commonwealth of Pennsylvania stands to save energy and money from this initiative, as facility managers and financial staff learn to use benchmarking to identify operational improvements, and steer capital investment planning through identification of underperforming buildings.

The commonwealth's utility benchmarking initiative is supported by [EnergyCAP](#), a private company based in State College, Pennsylvania. 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. As more agency's utility data comes online, the EnergyCAP benchmarking tool will provide more complete accounting of the progress agencies are making year over year toward the Executive Order goal of 3-percent reduction annually. Use of benchmarking will enhance the commonwealth's understanding of its carbon footprint associated with buildings and fixed structures.

Agency results on progress made toward the Executive Order goal of 3-percent per year reductions, as reported in EnergyCAP 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.

The Executive Order established a goal for the commonwealth that 25-percent of the state passenger fleet will be battery electric or plug-in hybrid electric vehicles by 2025. The analysis in Section 3 establishes the Executive Order goal based on the current vehicle passenger fleet mix. The section also provides a snapshot of the first-year program data.

C.) GreenGov Agency Certification Checklist: The GreenGov Agency Certification Checklist (Checklist) is a new tool developed by GreenGov for the purpose of assessing agencies’ progress delivering sustainability within government operations and achieving the Performance Goals for State Agencies identified in the Executive Order. 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 completion of the Checklist, as well as, agency’s participation in various GreenGov focus groups in 2020, will advance best practices and identify new approaches to common energy and sustainability barriers.

The Checklist consists of the performance categories of: Benchmarking and Evaluation; Buildings and Structures; Transportation; Products and Materials; Culture; Renewable Energy; and Resilience. It will

be used as an evaluation that “looks back” on the accomplishments of the previous fiscal year, starting with FY 18/19.

Agency results from the GreenGov Agency Certification Checklist and a look ahead at upcoming focus groups for 2020 are found in Section 6.



2. Agency Energy Reductions

Since the start of the Commonwealth Utility Benchmarking Initiative in 2018, agencies have undertaken a significant effort to collect facility information, locate missing utility bills, identify meters, and transfer accounts to a central bill payment repository. This effort has resulted in a dataset of 8,415 electricity, natural gas, and steam meters from agency accounts statewide.

DGS's Bureau of Procurement, Penn State Facilities Engineering Institute or PSFEI, and EnergyCAP staff analyzed these 8,415-commonwealth paid energy utility meters (Table 1). From this, a total of 5,170 meters (or 61-percent) were selected for further analysis because they met consistent data validation standards for reporting during the commonwealth's fiscal year 17/18 and 18/19 (the commonwealth's fiscal year is July 1 through June 30). Validation standards include energy utility meters reporting for 24 consecutive months and reviewed for consistency. In order to maximize metered data reporting, one exception was made to allow for smaller value accounts (averaging less than \$1,000 per month) to have one missing bill over that same two-year time period.

Table 1 shows the breakdown by agency and the percent of meters that are currently reporting two fiscal years, based on the data validation standards described above.

Reduce overall energy consumption by 3-percent per year by 2025

Table 1



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Commonwealth Energy Consumption - FY 2017/2018 - FY 2018/2019 Reduction

Known Electric Meters	Known Nat. Gas & Steam Meters	State Reporting Agency	Normalized Use (MMBtu)	FY 2017 Baseline MMBtus	FY 2018 Current MMBtus	Percentage Change	Metric Tons CO2 Reduction	Known Meter Count	Percent of Meters Reported
220	70	Dept of Corrections		669,213	655,073	-2.1%	1,352	290	58%
47	29	Dept of General Services		598,249	588,601	-1.6%	1,082	76	75%
191	657	Dept of Military and Veterans Affairs		446,876	434,087	-2.9%	530	848	82%
71	17	Dept of Human Services		346,091	318,019	-8.1%	1,558	88	63%
3,245	141	Dept of Transportation		269,549	260,334	-3.4%	619	3,386	75%
1,876	45	Dept of Conservation and Natural Resources		80,593	80,108	-0.6%	84	1,921	62%
7	3	Dept of Labor and Industry		65,085	64,572	-0.8%	65	10	80%
1,051	79	PA State Police		42,364	41,164	-2.8%	100	1,130	5%
80	18	PA Fish and Boat Commission		31,110	30,847	-0.8%	(53)	98	68%
145	12	PA Historical and Museum Commission		28,147	27,506	-2.3%	106	157	64%
7	5	PA Emergency Management Agency		25,026	25,320	1.2%	(65)	12	50%
113	7	Dept of Environmental Protection		20,362	21,228	4.3%	(77)	120	71%
5	2	Dept of Revenue		12,340	11,547	-6.4%	64	7	71%
224	10	PA Game Commission		10,139	10,279	1.4%	(42)	234	58%
22	1	Dept of Health		9,475	9,778	3.2%	(88)	23	30%
10	5	Dept of Agriculture		1,141	1,092	-4.3%	7	15	40%
7,314	1,101			2,655,761	2,579,554	-2.9%	5,242	8,415	61%

* 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.

From this analysis, the GreenGov Council is pleased to report a 2.9-percent reduction in energy consumption from fiscal year 17/18 to 18/19, just short of the 3-percent per year energy reduction goal established in the Executive Order. This 2.9-percent energy savings represents over \$1 million in utility cost savings during fiscal year 18/19.

A large contributing factor for the 2.9-percent reduction in energy consumption for this reporting year is attributed to commonwealth agency participation in projects through the Guaranteed Energy Savings Act or [GESA program](#). The GESA program 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 significantly reduce energy usage which result in decreased utility spending and serve as a vehicle to decrease growing utility costs in commonwealth facilities. Table 2 shows recent GESA projects. Some of these projects were completed prior to the fiscal year 17/18 energy baseline year, are under construction, or planned to be constructed. A continued active portfolio of GESA projects will continue to drive down energy consumption and support the Executive Order energy savings goals.

Table 2



DGS GESA Projects - Delivery and Savings Summary

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	Department of Corrections	SCI Dallas	Lighting, water, boiler & sewage	Completed	7/1/2016	20.0	2,137,857	\$2,200,000	341	4,123	172	1,757	
2	Department of General Services	Keystone Building	Lighting & controls	Measurement & Verification	1/23/2018	3.0	2,403,190	\$329,677	383	4,635	193	1,789	
3	State Police	Harrisburg Headquarters	Lighting, water & boiler	Measurement & Verification	2/1/2018	5.1	2,849,225	\$295,097	454	5,378	224	2,339	
4	Department of Human Services	Selinsgrove Center	Lighting, water, boilers & weatherization	Construction	2/15/2020	5.6	1,901,322	\$253,415	395	4,784	199	2,035	
5	Department of General Services	Capitol Complex	Lighting, window film, water systems, chillers	Construction	2/29/2020	18.0	9,003,360	\$1,200,000	1,390	16,826	701	6,368	
6	Department of Conservation & Natural Resources	West Region, Parks & Forests	Lighting & HVAC systems, building envelope	Construction	2/29/2020	5.5	2,814,916	\$375,182	436	5,282	220	2,247	
7	Independent Higher Education School	Thaddeus Stevens College	Lighting, controls, steam	Measurement & Verification	3/25/2020	2.7	1,030,172	\$137,305	190	2,301	96	979	
8	Department of Corrections	SCI Muncy	Lighting, solar, steam traps, windows, AC, EMS	Contract Award	4/1/2021	16.2	2,840,392	\$622,333	426	3,321	241	2,214	
9	Department of Corrections	SCI Houtzdale	Lighting, water, HVAC	Contract Award	11/30/2021	18.0	4,268,408	\$1,140,145	641	4,991	361	3,327	
10	Department of Conservation & Natural Resources	Central Region, Parks & Forests	Lighting, solar, sludge, BMS, electric to gas, geothermal	Contract Award	11/30/2021	\$5.0	2,135,128	\$243,361	321	2,496	181	1,664	
11	Department of Transportation	District 8 Facility	Lighting, building systems upgrades	Solicitation	6/15/2022	\$5.0	TBD	TBD	TBD	TBD	TBD	TBD	
12	Department of General Services	DGS Capitol Complex 2	Lighting, building systems upgrades	Solicitation	10/15/2022	\$15.0	TBD	TBD	TBD	TBD	TBD	TBD	
13	Fish & Boat Commission	Hatchery Facilities State-Wide	Lighting, water systems upgrades	Solicitation	11/30/2022	\$5.0	TBD	TBD	TBD	TBD	TBD	TBD	
Totals:						\$124.1	31,383,970	\$6,796,515	4,977	54,137	2,588	24,719	

*Annual Savings Benefits are Estimated

2.a. GreenGov Recommendations to Agencies

- Increase participation in the Utility Benchmarking Initiative to capture additional “reporting meters” in EnergyCAP for fiscal year 19/20.
- Expand utility tracking into all energy fuel types (i.e. propane, oil, etc.), and consider tracking water and waste utilities.
- Collaborate with facility and fiscal managers to identify future GESA project opportunities.

3. Passenger Fleet Electrification & Vehicle Miles Traveled

The number of vehicles in the commonwealth's fleet changes from month-to-month due to vehicle turnover and replacements, therefore the goal of converting 25-percent of the state passenger fleet to electric vehicles by 2025 will shift based on the fleet makeup in a particular year. DGS Bureau of Vehicle Management, PennDOT's Bureau of Maintenance and Operations, and the PA Turnpike Commission collaborated to develop a consistent definition for "passenger vehicle" and to create an annual reporting process to align the various data sets and business processes for consistent fleet benchmarking and reporting year-over-year.

For the purpose of the goals established in the Executive Order, "passenger vehicle" will be defined using Federal Highway Administration's Vehicle Class 1 & 2. In addition, the passenger vehicle definition excludes pick-up trucks and law enforcement vehicles from the goal. 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, 2019, there were 3,960 passenger vehicles in the commonwealth fleet. This sets our Executive Order electrification goal at 990 vehicles.

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

Table 3



Commonwealth Agency Vehicle Fleet* - Counts & Consumption
(as of 11/30/2019, rolling annual report)

Vehicle Classification	Total Vehicle Count	Vehicle Miles Traveled (VMT)	Fuel Consumption (Gallons)	Average Miles per Gallon (MPG)	Carbon Emissions (Pounds)
All (Classes 1-8)	20,477	233,281,997	19,177,412	12.16	402,917,426
Passenger** (Class 1-2)	3,960	54,106,130	2,176,315	24.86	42,742,827

- * PA Turnpike fleet not included
- * Rental vehicle & personal vehicle use not included
- ** Law enforcement vehicles & pickup trucks not included

Table 3 establishes a first-year benchmark of vehicle miles traveled, fuel consumption, and estimated carbon emissions. The Executive Order requires the evaluation of opportunities to reduce VMT and carbon emissions. These baseline measurements will help establish overall transportation emission reduction trends going forward resultant of Executive Order implementation.



As of November 30, 2019, the commonwealth had 53 electric vehicles in the fleet, comprised of six battery electric vehicles and 47 plug-in hybrid vehicles (Table 4). The commonwealth plans to improve the overall fleet fuel economy with expanded use of electric and hybrid vehicles, taking advantage of their superior miles per gallon (mpg) performance over standard internal combustion vehicles. To support these efforts, the commonwealth also has installed 18 level-2 workplace charging stations for commonwealth-owned vehicles, with further projects pending delivery.

Table 4



Commonwealth Agency Electric Vehicle Fleet & Charging Stations
 (as of 11/30/2019, rolling annual report)

Description	Count	Equipment Type
Battery Electric Vehicles (BEVs)	6	Chevrolet Bolt, Ford Focus
Plug-In Hybrid Electric Vehicles (PHEVs)	47	Chevrolet Volt, Chrysler Pacifica, Ford Fusion
Owned & Operated Charging Stations	18	Level 2 Stations (240V)
25% Electric Vehicle Goal (by 2025)	990	Battery Electric Vehicles (BEVs) Plug-In Hybrid Electric Vehicles (PHEVs)

3.a. GreenGov Recommendations to Agencies

- Expand fuel-efficient vehicle options on state contract and continue to prioritize replacing vehicles with the most fuel-efficient vehicles available in each class, including electric or hybrid vehicles.
- Reduce vehicle miles traveled through modification of business practices. Consider using telematics systems to support analysis for vehicle miles traveled reduction opportunities.
- Identify business areas where electric vehicles are best used and deliver charging station projects to support them.



4. Energy Procurement & Renewable Energy Investments

The Department of General Services' Bureau of Procurement purchases electricity and natural gas for over eight thousand utility accounts in the commonwealth. Shopping for electricity and natural gas in Pennsylvania's deregulated utility markets involves complex contracting processes in order to comply with state government procurement rules. Historically, the commonwealth's standard procurement time for energy purchases was a several week long process. DGS has increased efficiencies in the procurement process utilizing two strategies:

1) Invitation To Qualify, or ITQ: DGS developed an ITQ prequalification process, where energy suppliers are pre-approved in advance, by accepting the commonwealth's terms and conditions in order to be a qualified vendor.

2) Energy Risk Management Platform, or ERMA: DGS partnered with Penn State Facilities Energy Institute to develop a new internet-based platform for bidding, selecting, and tracking electric and natural gas contracts. ERMA's analytics allow for rapid determinations of best value for energy contracts.

The combination of ITQ and ERMA has enabled DGS to award thousands of utility accounts within a three hour window. Since July 1, 2017, DGS has awarded contracts on 5,268 electricity accounts and 97 natural gas accounts, resulting in an \$8.3 million reduction in energy expenses. This innovative procurement process has won national recognition from the National Association of State Chief Administrators for a [2019 Innovations in State Government award](#).

Due to the successful procurement strategy driving down costs, DGS was able to procure Renewable Energy Credits (RECs) for calendar year 2019 through 2021. For 2019, DGS procured 308,978 RECs at a cost of \$250,658 (less than 10-percent of the annual procurement savings) offsetting 40-percent of the commonwealth's total electricity load for the year. The Green-e certified RECs are derived from nationwide certified renewable energy sources.

According to the EPA's Greenhouse Gas Equivalencies Calculator, the commonwealth's purchase leads to an annual offset of approximately 218,494 metric tons of carbon dioxide or the emission equivalent of the electricity use of roughly 26,164 average homes for a year.

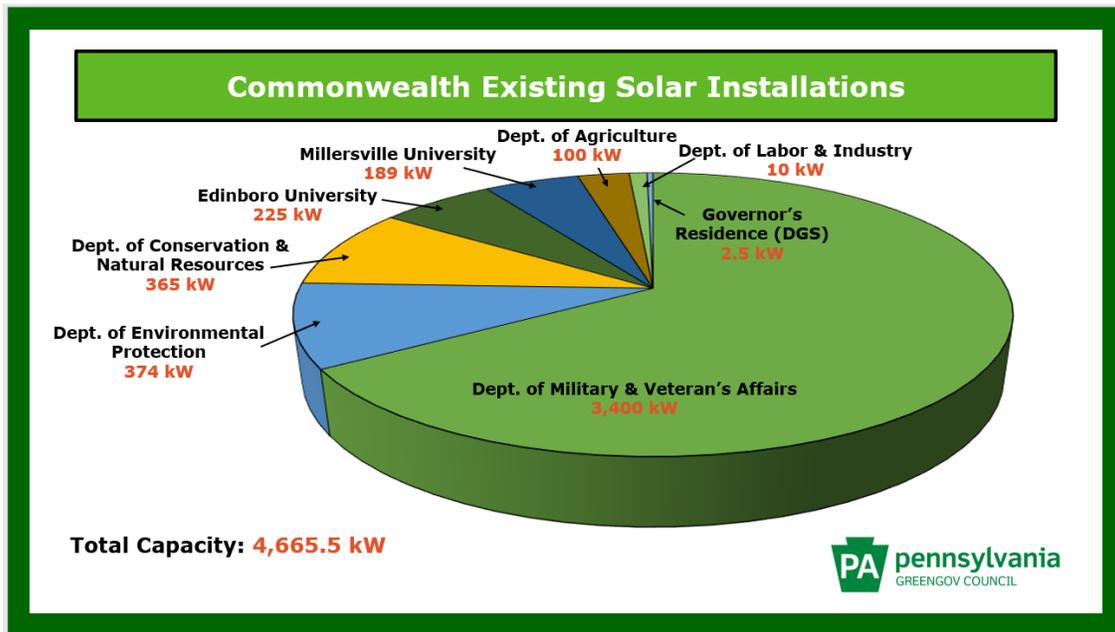
Procure renewable energy to offset at least 40-percent of the commonwealth's annual electricity, and/or directly purchase renewable power generation sited within PA

The Executive Order has a stated performance goal of purchasing renewable energy credits equal to 40 percent of the commonwealth's annual electricity use. These REC purchases are meeting the Executive Order, and have ranked the commonwealth at #35 on the U.S. EPA's Green Power Partnership National [Top 100 list](#).



Additionally, the commonwealth has solar installations generating onsite electricity that have been in service for the past several years and anticipates additional opportunities to add new solar at facilities across the state. Figure 1 serves a benchmark of these existing installations:

Figure 1



4.a. GreenGov Recommendations to Agencies

- Consider opportunities, such as Power Purchase Agreements, to purchase renewable energy sited within the commonwealth's borders for additional economic and air quality benefits.
- Explore the feasibility of expanding ground-mounted or rooftop solar in spaces owned and managed by the commonwealth.
- Investigate establishing a green bank for reinvestment in future solar opportunities in commonwealth-owned locations.



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 10-percent reduction in energy consumption over American Society of Heating, Refrigeration, and Air Conditioning Engineers (ANSI/ASHRAE/IES Standard 90.1.2016.) This criterion essentially establishes a 10-percent reduction 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 Executive Order's high-performance standards by incorporating into contract provisions.

Commonwealth-owned and leased high-performance building projects are listed in Table 5. These projects are planned to incorporate (at a minimum) the 10 percent reduction in energy consumption over ANSI/ASHRAE/IES Standard 90.1.2016.

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

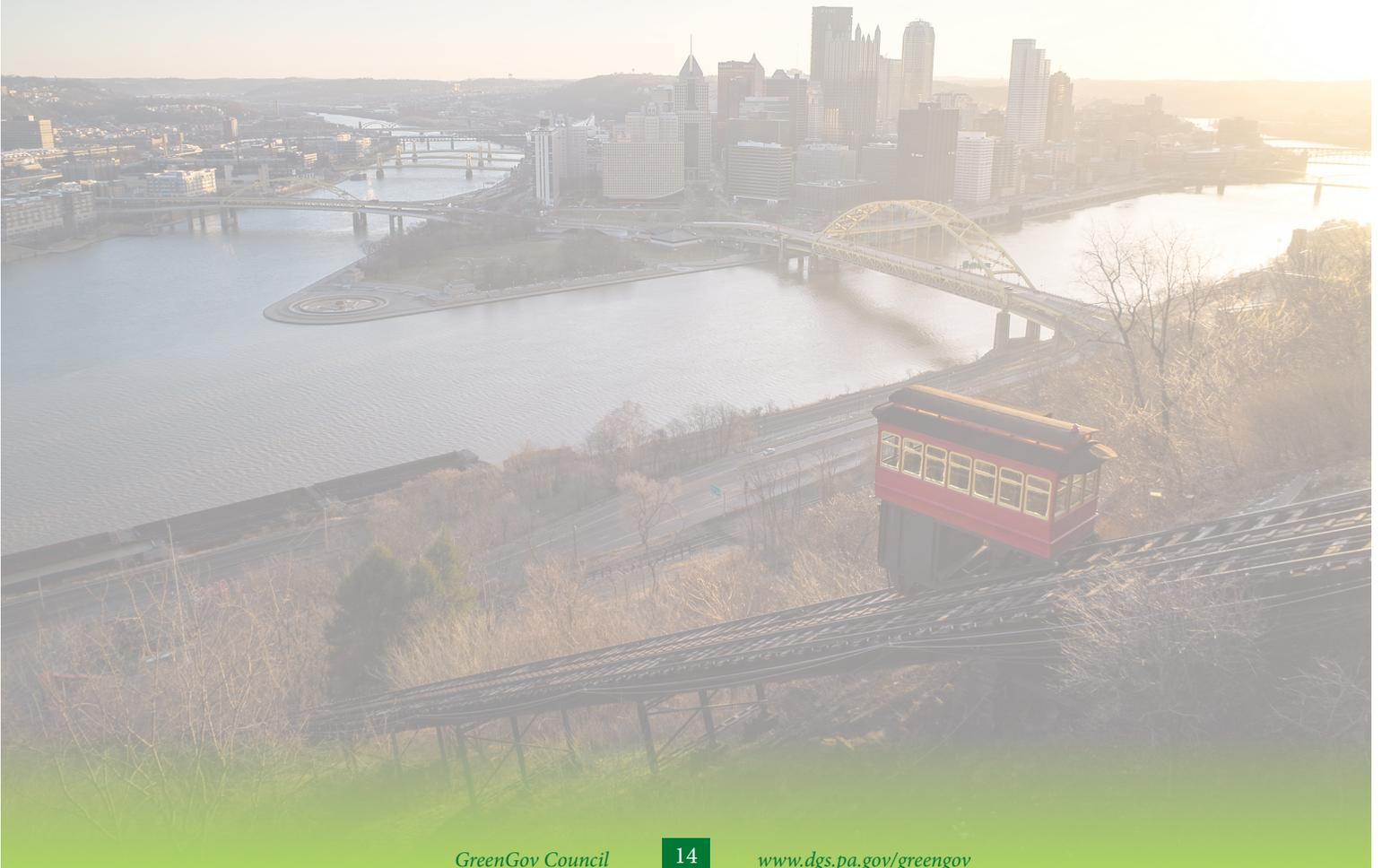


Table 5

 Commonwealth-Owned High Performance Building Delivery Projects in Construction & Planned								
Number	Agency	Project	Location	Project Description	Green Standard	Square Footage	Anticipated Delivery	Value
1	Department of Conservation & Natural Resources	Construct New Visitor Center and Office	Hickory Run State Park, Carbon County	Construct new combined visitor center and office for visitor contact, campground check-in, general park administration, visitor interpretive programming and visitor education. Building to include LEED Certification.	LEED Certification	13,300	Construct 2020	\$6.53 M
2	Game Commission	Construct Replacement Regional Office Facility	South-Central Regional Office, Huntingdon County	Demolish existing facility and construct energy-efficient replacement utilizing high performance building envelope and geothermal mechanical systems.	10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016	TBD	Design 2020 Construct 2021	\$3.30 M
3	Department of Military & Veterans Affairs	Construct New Police Station Facility	Fort Indiantown Gap, Lebanon County	Construct new facility utilizing high performance building envelope and systems. Project includes; central alarm systems, holding cell, arms vault, evidence room, locker rooms, security fencing and stand-by generator.	10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016	6,000	Design 2020 Construct 2021	\$2.85 M
4	Department of Conservation & Natural Resources	Construct New Resource Management Center	Delaware State Forest, Pike County	Construct new office and storage buildings utilizing high performance building envelope and systems. Building to include LEED Certification.	LEED Certification	16,000	Design 2020 Construct 2022	\$7.00 M
5	Department of Conservation & Natural Resources	Construct New Park Office	Hills Creek State Park, Tioga County	Construct new park office for visitor contact, general park administration, visitor interpretive programming and education. Building to include LEED Certification.	LEED Certification	6,000	Design 2020 Construct 2022	\$4.00 M
6	Department of Conservation & Natural Resources	Construct New Park Office	Marsh Creek State Park, Chester County	Construct new park office for visitor contact, general park administration, visitor interpretive programming and education. Building to include PV solar array and LEED Certification.	LEED Certification	TBD	Design 2020 Construct 2022	\$2.00 M
7	State-Related Higher Education School	Renovation of Historic Vail Hall	Lincoln University, Chester County	Renovate Vail Hall and construct new 14,000 sq. ft. replacement addition for office consolidation utilizing high performance building envelope and systems.	10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016	14,000	Design 2020 Construct 2022	\$12.00 M
8	State System of Higher Education	Renovation of Baron-Forness Library	Edinboro University, Erie County	Renovate Baron-Forness Library including energy-efficient mechanical systems, high performance windows, exterior façade upgrades and security and access controls.	10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016	102,000	Design 2020 Construct 2022	\$13.30 M
9	Independent Higher Education School	Construct New Community Learning Center	Thaddeus Stevens College of Technology, Lancaster County	Construct new facility including; child care center, STEM laboratory, classrooms, fitness area and computer lab. Building to utilize high performance building envelope and systems.	10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016	13,600	Design 2021 Construct 2022	\$4.00 M
10	Department of Conservation & Natural Resources	Construct New Park Office	Keystone State Park, Westmoreland County	Construct new park office for visitor contact, general park administration, visitor interpretive programming and education. Building to utilize high performance envelope & systems.	10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016	TBD	Design 2020 Construct TBD	\$2.00 M
11	Department of Conservation & Natural Resources	Construct New Resource Management Center	Gallitzin State Forest, Cambria County	Construct new office and storage buildings utilizing high performance building envelope and systems. Facility to include net-zero PV solar array and LEED Certification.	LEED Certification	14,800	Design TBD Construct TBD	\$4.80 M
Commonwealth-Leased High Performance Building Delivery								
Number	Agency	Project	Location	Project Description	Green Standard	Square Footage	Anticipated Delivery	Value
1	Department of Human Services & Office of Administration	Build-to-Suit Office Building	7th Street Harrisburg City, Dauphin County	The new space will be built with energy conservation features including LED lighting, water conservation measures, site design to manage glare and heat gain, and use of recycled materials.	10% Reduction over ANSI/ASHRAE/IES Standard 90.1.2016	120,000	Design 2020 Construct 2021	TBD

5.a. GreenGov Recommendations to Agencies

- Use freely available measurement tools, such as, the U.S. Department of Energy’s [COMCheck](#), and/or ENERGY STAR’s [Target Finder](#) to assist with building design goals and demonstrate design compliance to the Executive Order’s goal.
- Work with the lessor community through DGS to enhance the energy efficiency and sustainability of commonwealth lease spaces during lease contract renewals.
- Investigate nationally recognized green certifications and consider monetary thresholds (and other factors) to go beyond the minimum high-performance criteria set forth in the Executive Orders.

6. Agency Certification Checklist and Focus groups

During 2019, GreenGov Council staff met with each state agency. Over that time, the GreenGov Agency Certification Checklist (Checklist) was developed and refined based on those discussions. The Checklist is divided into various green and sustainable categories as summarized in Table 6. Within the Checklist, each category has a series of strategies with assigned points for the purpose of agency evaluations.

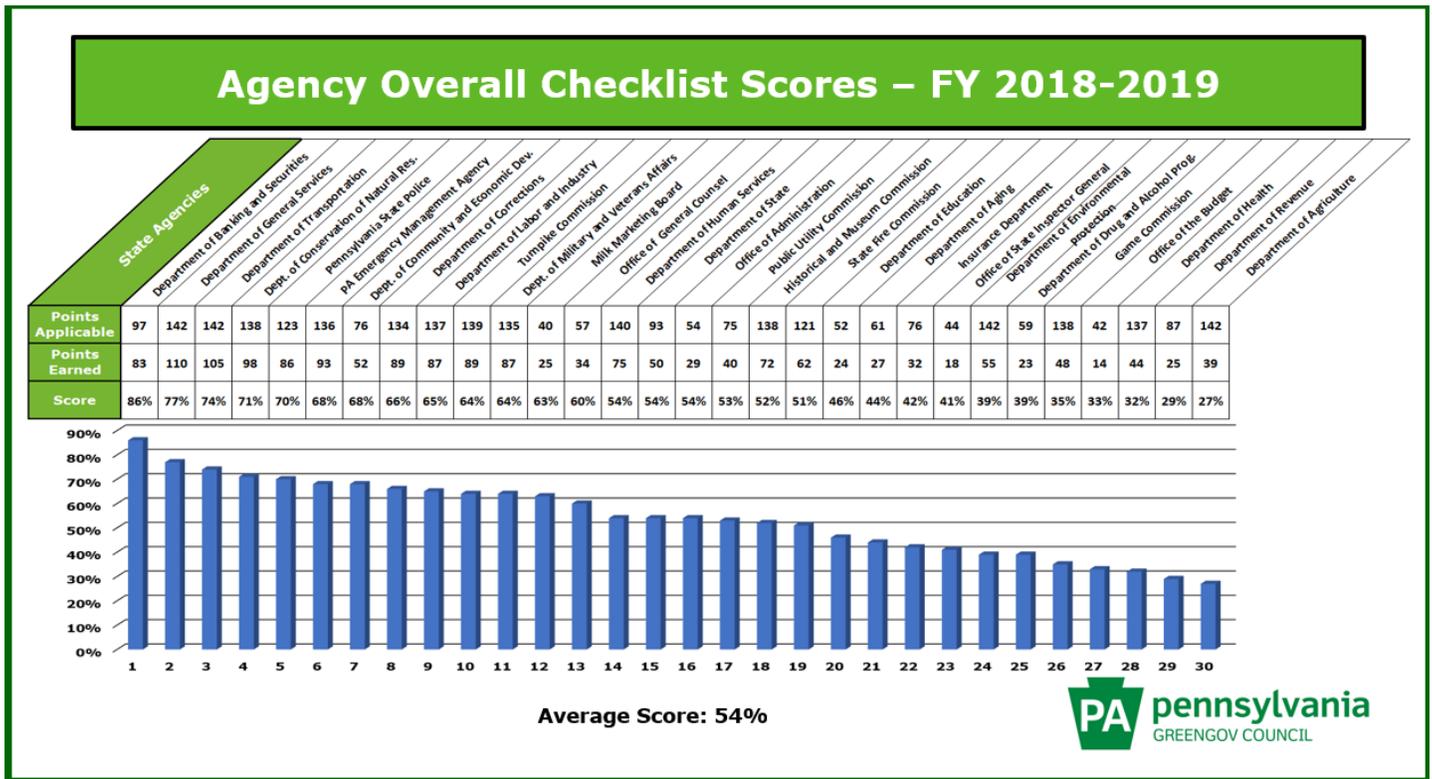
Table 6

GreenGov Agency Certification Checklist Categories	
Benchmarking & Evaluation	<ul style="list-style-type: none"> Assessment of key indicators for measuring and tracking sustainability in buildings, transportation, and product procurement
Buildings & Structures	<ul style="list-style-type: none"> Review of facility operations and maintenance improvements and building systems efficiency upgrades
Transportation	<ul style="list-style-type: none"> Review of vehicle fleets for opportunities to improve maintenance intervals and efficiency (i.e. electric and hybrid vehicles)
Products & Materials	<ul style="list-style-type: none"> Review of environmental attributes of products purchased and whether products are being recycled
Culture	<ul style="list-style-type: none"> Review of how an agency is interacting with its employees and the public with regards to sustainable practices, policies, and education
Renewable Energy	<ul style="list-style-type: none"> Review of progress made to purchase or site new renewable energy facilities in the Commonwealth
Resilience	<ul style="list-style-type: none"> Analysis of operations, equipment, policies and practices that support agency preparedness & recovery from incidents such as severe weather impacts

All thirty commonwealth agencies completed the Checklist representing their respective agency’s sustainability activities looking back on the fiscal year 18/19. Agency Checklists are posted on the GreenGov website for public review.

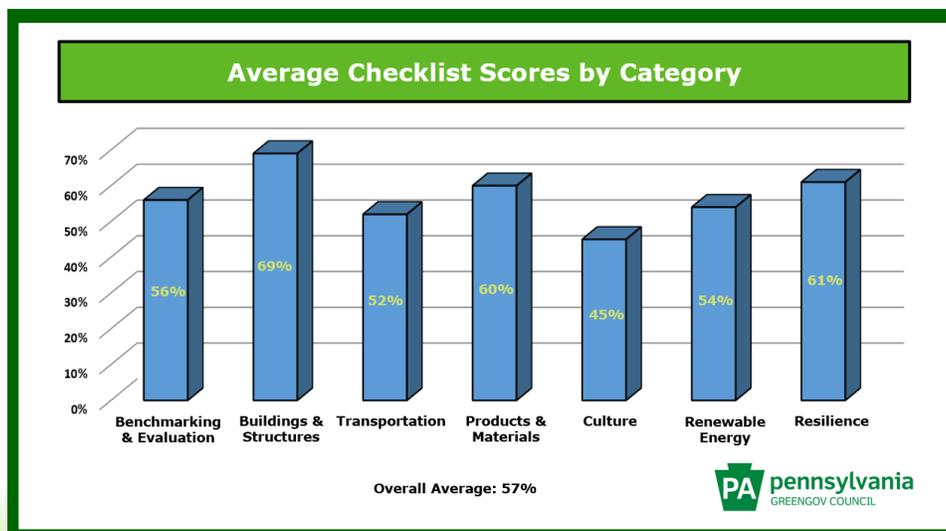
The Checklist is designed to help identify new opportunities for continuous improvement, and therefore is not intended for agencies to achieve a perfect score. The percentages assigned to each agency are not indicative of “passing” or “failing” grades. In addition, each agency has differing opportunities and operational footprints compared to others. The Checklist will endeavor to show progress over time 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 2 shows the overall Checklist score by agency for the fiscal year 2018-19. Agencies were scored based on “Points Applicable” to them.

Figure 2



The GreenGov Council anticipates making additional refinements to the Checklist in 2020 for use in the fiscal year 2019-20 evaluation. Additional reporting years will yield data trends and new insights into agency progress. As an example, figure 3 shows average scores by Checklist category across all thirty agencies. The figure shows relatively high performance for the commonwealth in “Building & Structures,” and a potential area for significant improvement within the “Culture” category. Additional refinements and data analysis will be useful to direct time and resources in areas where agency support is needed.

Figure 3



All commonwealth agencies are responsible for the development of policies and strategies to achieve the Executive Order goals, and to seek to advance their Checklist results over time. 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. The GreenGov Council is planning to facilitate agency engagement efforts in 2020 by hosting six interagency focus groups. Agencies will participate in focus groups, based on where their business areas intersect and/or where additional support is needed. Table 7 describes the six focus group program areas, including a general summary and planned and proposed meeting dates.

Table 7

 GreenGov Program - Focus Group Summary	
Small Agency Operations (Sustainability Team)	
Participants in the Small Agency Operations (Sustainability Team) group will be tasked with the development of sustainability policies and business (reduction/consolidation) strategies, such as, those outlined within the GreenGov Agency Certification Checklist. This group may also explore outreach opportunities for employee and public engagement.	Meeting Date Targets: January 16 & June
EV's & EV Charging	
Participants in the EV and EV Charging group will be tasked with assessing agency vehicle fleets and identifying opportunities for electrification. The group may develop plans & specifications for new charging station projects. The group may work on new policy, such as, workplace and home headquartered EV charging policies .	Meeting Date Targets: February 13, July & October
Green Facility Management	
Participants in the Green Facility Management group will be tasked with the development of a facility management manual for the use of all agencies, revision of Management Directive 720.5 to focus on energy conservation and the development of best practices for the scoping and delivery of GESA projects.	Meeting Date Targets: March 9 & August
Products & Materials (Recycling)	
Participants in the Products & Materials (Recycling) group will be tasked with the development of an enhanced standardized recycling plan within owned and leased facilities state-wide that will include employee participation and education components as well as pilot programs. This group may also explore existing green products and materials on state contract, and suggest expansion of products not represented.	Meeting Date Targets: March 26 & September
Utility Management	
Participants in the Utility Management group will develop agency energy portfolios and data management using the EnergyCAP system. The group will be focused on delivering standardized reports for the tracking and benchmarking of utilities, in order to identify new energy and cost savings investment opportunities to share with their executive level staff.	Meeting Date Targets: April 9 & September
Construction & Leasing Specs	
Participants in the Construction & Leasing Specs group will be tasked with the development, evaluation and inclusion of energy-saving specifications, techniques and measurements within Commonwealth construction projects and lease agreements through the sharing of information and collaboration of agencies and private industry.	Meeting Date Targets: April 20 & October

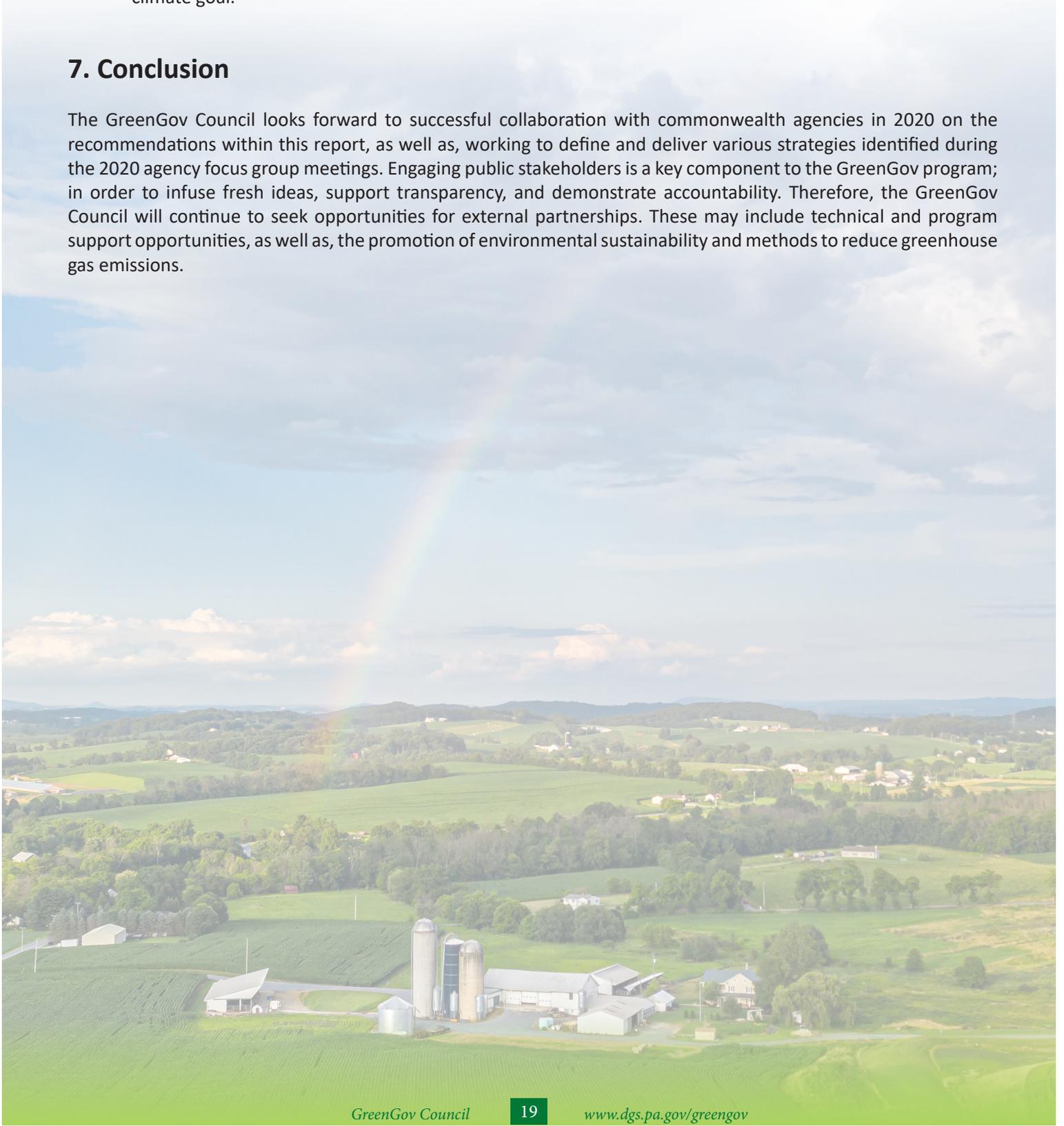
Focus groups are not open to the public, however, the GreenGov Council may seek outside help or support, if specific projects can be identified to support agency sustainability efforts. Any outcomes, results, or needs will be shared in future public stakeholder meetings as a component of public engagement. Interested public stakeholders 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.

6.a. GreenGov Recommendations to Agencies

- Take steps in 2020 to investigate business areas to implement sustainability measures and improve their GreenGov Agency Checklist performance.
- Identify opportunities to share commonwealth lead-by-example best practices, engaging businesses and public stakeholders in opportunities to reduce greenhouse gas emissions to support Pennsylvania's climate goal.

7. Conclusion

The GreenGov Council looks forward to successful collaboration with commonwealth agencies in 2020 on the recommendations within this report, as well as, working to define and deliver various strategies identified during the 2020 agency focus group meetings. Engaging public stakeholders is a key component to the GreenGov program; in order to infuse fresh ideas, support transparency, and demonstrate accountability. Therefore, the GreenGov Council will continue to seek opportunities for external partnerships. These may include technical and program support opportunities, as well as, the promotion of environmental sustainability and methods to reduce greenhouse gas emissions.





Green Notes





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