

2020 Status of Programs, Annual State Agency Report
Greenhouse Gas Emission Reductions for CY 2019
Energy Efficiency for Affordable Housing

This report provides an estimate of reduced greenhouse gas (GHG) emissions as a result of the Maryland Department of Housing and Community Development's (Department) programs during calendar year (CY) 2019. This report is pursuant to State Government Article §2-1305, as defined in House Bill 514 Chapter 429, 2015.

Program Descriptions

The Maryland Department of Housing and Community Development ("DHCD") is a principal department within the Executive Branch of Maryland State Government. DHCD administers programs directed at a wide cross section of the Maryland economy. DHCD's financing products leverage public, private and nonprofit investments. Deployed projects create jobs, generate state and local tax revenue, and enable communities to address their affordable housing and redevelopment goals. DHCD provides solutions for renters looking to purchase their own home, for small businesses that are looking to expand, for energy efficiency efforts to reduce the energy burden of low income families, to protect the environment, and for homeless services. DHCD's community development programs enhance existing neighborhood resources, support economic development, rebuild infrastructure, and improve the quality of life for all Marylanders.

Within the Department, the division of Housing and Building Energy programs manages a suite of loan and grant programs for Maryland homeowners, renters and other building owners. These programs reduce energy costs and address critical health and safety issues for Maryland residents and limited income families.

In CY 2019, the Department's energy programs installed upgrades that saved **0.011** million metric tons of carbon dioxide equivalent (MMTCO₂e) in the first year of installation. Taking into account the estimated lifetime of energy measures, the Department's programs realized a reduction of **0.065** MMTCO₂e in CY 2019 from projects completed from CY 2012 to CY 2019. Finally, from CY 2012 to CY 2019, the cumulative savings from all projects across years was **0.386** MMTCO₂e.

The Department has begun to incorporate other programs that it administers into its calculation of greenhouse gas reductions. In this report the Department has in addition included the CY 2019 reductions for both its Multifamily Rental Housing Finance section and the NetZero Program.

The Department's Housing and Building Energy Programs division includes the following grant programs:

- **The Weatherization Assistance Program** installs energy conservation measures for eligible limited income households. These measures also reduce greenhouse gas emissions and the cost of maintenance for these homes. Funding is provided by the U.S. Department of Energy and the

Strategic Energy Investment Fund. The Department works with Local Weatherization Agencies (nonprofits and local governments) to complete these projects.

- **The EmPOWER Low Income Energy Efficiency Program and the Multifamily Energy Efficiency and Housing Affordability Program** help limited income households and affordable housing managers with installation of energy conservation measures in their homes and buildings. Funding is provided by ratepayers of the five (5) participating EmPOWER Maryland utility companies. These funds are regulated by the Maryland Public Service Commission.
- **Emergency No-heat/No-cool** to resolve emergency heating and cooling related crises faced by low income marylanders. From November 1 - March 31 (“no heat season”) the program provides heating system repair/replacement for applicants with non-functioning heating systems. From June 1 - September 30 (“no cool season”) the program provides cooling system repair/replacement for applicants with non-functioning cooling systems. The program is also able to provide replacement for non-functioning hot water heaters from April 1st - September 30th (“hot water season”).

The following grant programs are closed, but the energy conservation measure’s lifetime savings continue to be in effect.

- **The Targeted and Enhanced Weatherization Program** combined typical weatherization improvements with measures that reduced health and safety risks in the home. This program for limited income homeowners in the Baltimore Gas & Electric territory outside of Baltimore City was funded through the Customer Investment Fund created during the merger of Constellation and Exelon. This program was funded with a one-time grant and has been fully expended.
- **The Improved Efficiency for Affordable Multifamily Housing Program** was funded through the Customer Investment Fund and it covers the costs of energy conservation measures for affordable multifamily projects in the Baltimore Gas & Electric territory. This pilot program was funded with a one-time grant and has been fully expended. Construction completed in CY 2018.

The Department also offers a growing portfolio of energy loan products.

- **The BeSMART Home Energy Loan Program** offers financing to homeowners across the state for energy efficiency replacement and/or upgrade of appliances, heating, cooling and ventilation systems and whole house envelope improvements.
- **The Net Zero Construction Loan Program** funds the construction of new or existing single and multifamily housing in Maryland. The project must be Net Zero or Net Zero Ready (Home Energy Rating System score of 50). The Department deployed this program at the Perry Point Veterans Housing Project, using funding from the Strategic Energy Investment Fund and leveraged with the BeSMART loan program for efficiency measures. Construction finished in CY 2018.

The Department administers a number of programs outside of the Housing and Building Energy Programs that provide significant reductions in greenhouse gas emissions. DHCD is working to account for all of these programs in its greenhouse gas reduction calculations. The first of these programs to be included in the calculation is below.

- **Multifamily Housing** expands quality, affordable rental and transitional housing opportunities for Marylanders by financing the development, rehabilitation, and preservation of rental communities and transitional housing, and by administering rental assistance programs and the Federal Low Income Housing Tax Credit program.

Program Objectives

Under the Housing and Building Energy Programs, the Division provides grants and low cost loans with flexible terms for the purchase and installation of energy efficiency improvements in single family and affordable multifamily rental housing developments. The program is being undertaken as part of the State's efforts to:

1. reduce the energy cost burden on Marylanders,
2. increase energy efficiency,
3. reduce greenhouse gas emissions,
4. promote energy efficiency and renewable energy sources,
5. provide a healthier environment in which to live,
6. create and preserve affordable rental housing opportunities,
7. create jobs, and
8. foster business development and sustainable mortgages by reducing the energy burden on residents and property owners.

Implementation Milestones

The 2015 Greenhouse Gas Emissions Reduction Act Plan Update published October 2015 stated that the Department's programs could reduce 0.02 million metric tons of carbon dioxide equivalent (MMTCO₂e) by 2020 (LIEEP, MEEHA, WAP).

In CY 2019, the Department's energy programs completed energy efficiency upgrades of **9,239** households. These improvements represent a first year reduction of **11,237** metric tons of carbon dioxide equivalent (MTCO₂e) - or **0.011** MMTCO₂e. The average life of savings for each energy project is eight years. For the **44,508** households that received energy efficiency upgrades since CY 2012, in CY 2019 the realized savings over eight years were **73,012** MTCO₂e (0.064 MMTCO₂e).

Year	Households Served
CY2012	3,222
CY2013	3,788
CY2014	6,517
CY2015	5,458
CY2016	5,517
CY2017	4,695
CY2018	4,787
CY 2019	9,239

Estimated Emission Reductions for CY 2019

In CY 2019, the Department's Housing and Building Energy programs installed energy efficiency retrofits for single family households, renters, and multifamily tenants. The programs delivered **129,230** in MMBtu savings. Below is a table of savings by program.

CY 2019 – SAVINGS IN THE INSTALLATION YEAR		
Program	MMBtu Saved	MTCO₂e

EmPOWER - Single Family (State)	65,873	5,255
EmPOWER - Multifamily (State)	25,138	1,800
Other Programs (State, Federal)	5,368	505
DOE Weatherization Assistance Program (Federal)	4,925	491
Multifamily Rental Housing (Federal, State, Special)	22,348	2,550
NetZero (Special)	5,609	634
First Year Reductions: TOTAL	129,230	11,232

For the work installed in CY 2012 to 2019, the division estimates that the average life of its measures is eight years. For the projects installed in CY 2019, these projects will continue to reduce GHG emissions every year until 2027. Some measures will provide savings well into the future, beyond 2030, that this calculation does not capture.

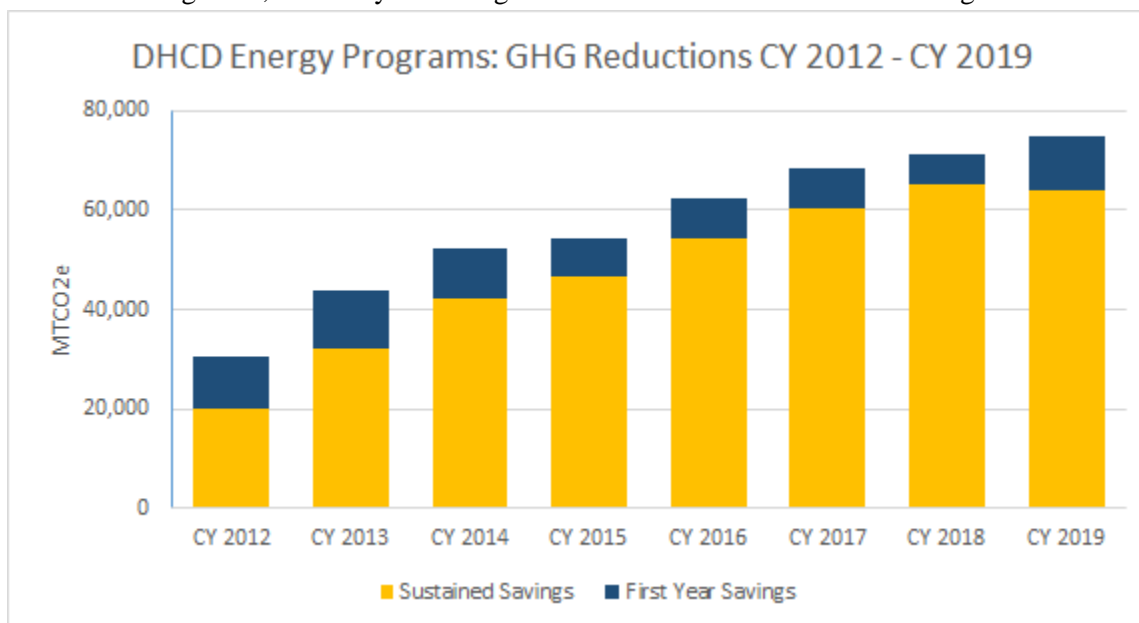
In CY 2019, the savings from CY 2012 will exceed the useful life estimate and the savings will no longer be calculated for these projects in future years.¹

CY 2019 – SUSTAINED SAVINGS OVER LIFETIME OF EQUIPMENT			
Year	First Year MTCO ₂ e	Sustained MT CO ₂ e	Sustained MMTCO ₂ e
CY 2012	10,218	20,124	0.020
CY 2013	11,782	32,229	0.032
CY 2014	10,169	42,301	0.042
CY 2015	7,346	46,832	0.047
CY 2016	8,164	54,200	0.054
CY 2017	7,971	60,366	0.060
CY 2018	6,126	65,334	0.065
CY 2019	11,237	64,820	0.065

Note: Emission factors change over time based on the efficiency of the electrical grid. This means that 1 kWh reduction in CY 2012 resulted in more GHG emissions avoided than 1 kWh in CY 2019.

¹ EUL see page 3 for Table1 - Berkeley Labs - Energy Savings lifetimes and Persistence
<https://eta.lbl.gov/sites/all/files/publications/savings-lifetime-persistence-brief.pdf>

In the following chart, the first year savings are included with the sustained savings over time.



The Division's reduction in greenhouse gas emissions was calculated using project specific energy reductions estimated per measure. The Division used the 2019 emission factors provided by PJM, the Maryland region electric grid operator, the Department of Energy's eGRID sub-regional data and data from the U.S. Environmental Protection Agency's national greenhouse gas inventory.²

Fuel	Value	Unit	Source	Link
Electricity				
CO ₂	851.193	lbs/MWH	PJM	System Mix 2019, https://gats.pjm-eis.com/gats2/PublicReports/PJMSystemMix/Filter
CH ₄	0.061		DOE	2018 eGRID, https://www.epa.gov/energy/power-profiler#/RFCE
N ₂ O	0.008			
Natural Gas				
CO ₂	0.05444	kg/scf	EPA	https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf
CH ₄	0.00103	g/scf		
N ₂ O	0.0001			
Oil				
CO ₂	10.21	kg/gallon	EPA	https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf
CH ₄	0.41	g/gallon		
N ₂ O	0.08	g/gallon		
Global Warming Potential				
CO ₂	1	SAR, 100	IPCC	https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-

² The Division used CO₂ emission factors from the PJM Environmental Information System, [<https://www.pjm-eis.com/reports-and-events/public-reports.aspx>], CH₄ and N₂O factors from the DOE Power Profiler tool based on the eGRID subregion [<https://www.epa.gov/energy/power-profiler#/RFCE>], and natural gas and oil factors from the EPA's national inventory [https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf]. Global Warming Potential data come from the Intergovernmental Panel on Climate Change's Second Assessment Report (100 year).

CH ₄	21	Year		2.html
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The Department also took into account changes in the grid over time in calculating historic savings. The PJM Factor for CO₂ emissions has decreased 22 percent since CY 2012.

PJM Factor	
Year	CO ₂ (lbs/MWH)
CY2012	1,092
CY2013	1,112
CY2014	1,108
CY2015	1,014
CY2016	992
CY2017	948
CY2018	924
CY2019	851

Enhancement Opportunities

In CY 2019, the Department continued to pursue opportunities to expand its loan and grant programs. The Department sees an opportunity from leveraging the experience of its multifamily, single family, and business lending to grow the energy programs. The Department is currently undergoing a comprehensive evaluation to develop a needs assessment for the fiscal years 2021 to 2023.

Funding

In each of the last three fiscal years, the Division's financial commitments (direct benefits to Marylanders and administrative costs) averaged \$30 million. This is largely supported by the EmPOWER funding which requires renewal every three years.

Challenges

The Department is not slated to receive SEIF funds from RGGI proceeds in FY 2021. These funds allow the Department to maximize savings per project and may have an impact on the savings the Department is able to achieve if no funds are allocated.

The Department is also finishing out the current EmPOWER cycle (2018-2020) and submitting its proposed plan for the next three years. The EmPOWER programs administered by the Department are a vital part of its greenhouse gas reduction impact.

The lack of dedicated resources to assist with the Department's expansion of greenhouse gas reduction accounting to other programs. These resources could assist greatly in these expansion efforts.

Relevant Information

The portfolio of programs within the Department of Housing and Community Development has a direct impact on the economic vitality of the State.

The Housing and Building Energy Programs support residents and businesses in direct funding of energy efficiency projects that create or sustain jobs. Energy bill reductions free up funds that can be spent on family well-being or as investments. The programs improve health through reduced air and water pollution from power plants, but also directly remediate hazards such as mold, asbestos and lead in the house.

Through the Department's other programs it is indirectly supporting energy efficiency by providing funding for projects that are required to meet criteria that inherently promote energy efficient improvements. By enforcing these requirements these other programs are similarly able to provide meaningful energy savings for Maryland residents and reductions in pollution.

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