

2022 Status of Programs, Annual State Agency Report
Greenhouse Gas Emission Reductions for CY 2021
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) 2021. 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 toward 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, small businesses that are looking to expand, energy efficiency efforts to reduce the energy burden of low income families, protection of 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 2021, the Department's energy programs saved **0.07** 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 **0.063** MMTCO₂e in CY 2021 from projects completed from CY 2014 to CY 2021. Finally, from CY 2014 to CY 2021, the cumulative savings from all projects across years was **0.452** MMTCO₂e.

The Department continues to incorporate other programs into its calculation of greenhouse gas reductions. In this report, the Department has also included the CY 2021 reductions for both its Multifamily Rental Housing Finance programs 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. 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. 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 to March 31 (“no heat season”) the program provides heating system repair/replacement for applicants with non-functioning heating systems. From June 1 to 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 to September 30th (“hot water season”).

The following programs, while closed, continue to yield lifetime energy savings:

- **The Targeted and Enhanced Weatherization Program** combined typical weatherization improvements with measures that reduce 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.
- **The Improved Efficiency for Affordable Multifamily Housing Program** was funded through the Customer Investment Fund and 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. 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 Maryland homeowners 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 or less). This program was deployed 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 (MMT CO_2e) by 2020 (LIEEP, MEEHA, WAP).

In CY 2021, the Department's energy programs completed energy efficiency upgrades of **8,474** households. These improvements represent a first year reduction of **7,373** metric tons of carbon dioxide equivalent (M TCO_2e) - or **0.007** MMT CO_2e . The average life of savings for each energy project is eight years. For the **54,877** households that received energy efficiency upgrades since CY 2014, in CY 2021 the realized savings over eight years were **67,388** M TCO_2e (0.07 MMT CO_2e).

Year	Households Served
CY2014	6,517
CY2015	5,458
CY2016	5,517
CY2017	4,695
CY2018	4,787
CY2019	9,239
CY2020	8,905
CY 2021	8,474

Estimated Emission Reductions for CY 2021

In CY 2021, the Department's Housing and Building Energy programs installed energy efficiency

retrofits for single family households, renters, and multifamily tenants. The programs delivered **75,482** in MMBtu savings. Below is a table of savings by program.

CY 2021 – SAVINGS IN THE INSTALLATION YEAR		
Program	MMBtu Saved	MTCO ₂ e
EmPOWER - Single Family (State)	13,431	1,321
EmPOWER - Multifamily (State)	30,532	2,614
Other Programs (State, Federal)	8,910	914
DOE Weatherization Assistance Program (Federal)	1,665	163
Multifamily Rental Housing (Federal, State, Special)	20,462	2,304
NetZero (Special)	479	54
First Year Reductions: TOTAL	75,482	7,373

For the work installed in CY 2014 to 2021, the division estimates that the average life of its measures is eight years. For the projects installed in CY 2021, these projects will continue to reduce GHG emissions every year until 2028. Some measures will provide savings well into the future, beyond 2030, that this calculation does not capture.

In CY 2021, the savings from CY 2014 will exceed the useful life estimate and the savings will no longer be calculated for these projects in future years.¹

CY 2021 – SUSTAINED SAVINGS OVER LIFETIME OF EQUIPMENT			
Year	First Year MTCO ₂ e	Sustained MT CO ₂ e	Sustained MMTCO ₂ e
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	56,582	0.057
CY 2020	9,002	62,908	0.063

CY 2021	7,373	63,358	0.063
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Note: Emission factors change over time based on the efficiency of the electrical grid. This means that 1 kWh reduction in CY 2014 resulted in more GHG emissions avoided than 1 kWh in CY 2021.

The Division's reduction in greenhouse gas emissions was calculated using project specific energy reductions estimated per measure. The Division used the 2021 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

¹EUL see page 3 for Table1 - Berkeley Labs - Energy Savings lifetimes and Persistence
<https://emp.lbl.gov/publications/energy-savings-lifetimes-and>

²The Division used CO2 emission factors from the PJM Environmental Information System, [<https://www.pjm.com/eis/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/egrid/power-profiler/>], 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).

Fuel	Value	Unit	Source	Link
Electricity				
CO ₂	843.3056	lbs/MWH	PJM	System Mix 2021, https://gats.pjm.com/GATS2/PublicReports/PJMSystemMix/Filter
CH ₄	0.061		DOE	2018 eGRID, https://www.epa.gov/egrid/power-profiler/
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 Year	IPCC	https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html
CH ₄	21			
N ₂ O	310			

The Department also took into account changes in the grid over time in calculating historic savings. The PJM Factor increased for the first time since 2010. It is still 23% less than it was in CY 2014.

	PJM Factor
Year	CO ₂ (lbs/MWH)
CY2014	1,108
CY2015	1,014
CY2016	992
CY2017	948
CY2018	924
CY2019	851
CY2020	791
CY2021	843

Enhancement Opportunities

In CY 2021, the Department continued to pursue opportunities to expand its assessment of greenhouse gas emission reductions. The Department sees an opportunity to expand its greenhouse gas emission reductions assessment into its rehabilitation programs. The department is currently working through how to accurately capture and report these reductions.

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

During CY 2021 the Department continued to feel the remnant effects of the Covid-19 pandemic, specifically supply chain issues. Slowdowns to project timelines and shortages of required equipment caused a delay in project completions. This resulted in lower than expected program production for CY 2021.

Despite these challenges the Department continues to work to expand and refine the collaboration between its programs to provide a more complete picture of its greenhouse gas reduction.

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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