



U.S. DEPARTMENT OF  
**ENERGY**

# Federal Government Greenhouse Gas Emissions: Overview and FY 2021 Findings

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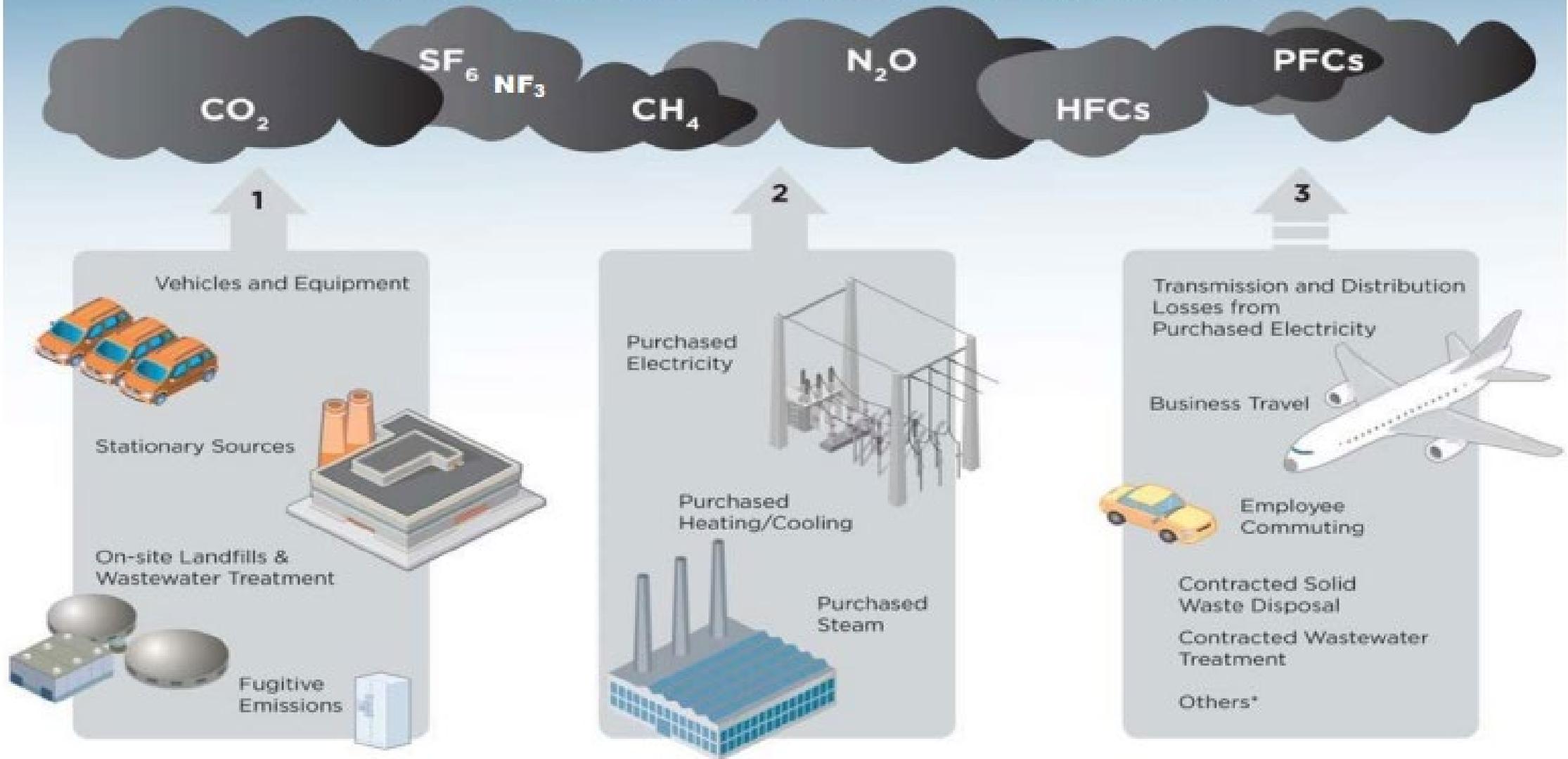


<https://www.energy.gov/eere/femp/federal-comprehensive-annual-energy-performance-data>

# Greenhouse Gas Background

- Sources and Scope of Federal Greenhouse Gas Emissions
  - Scope 1 (Direct emissions)
    - Vehicles and Equipment
    - Stationary Sources
    - Fugitive Emissions
  - Scope 2 (Indirect emissions from purchased energy generated by others)
    - Purchased Electricity
    - Purchased Heat & Cooling
    - Purchased Steam
  - Scope 3 (last collected FY 2017)
    - Commuting
    - Business Travel (ground and air)
    - Electricity transmission/distribution losses
    - Contracted Waste Disposal
    - Contracted Wastewater Treatment

# Common Sources of Federal Greenhouse Gas Emissions



## SCOPE 1:

Greenhouse gas emissions from sources that are owned or controlled by a Federal agency.

## SCOPE 2:

Greenhouse gas emissions resulting from the generation of electricity, heat, or steam purchased by a Federal agency.

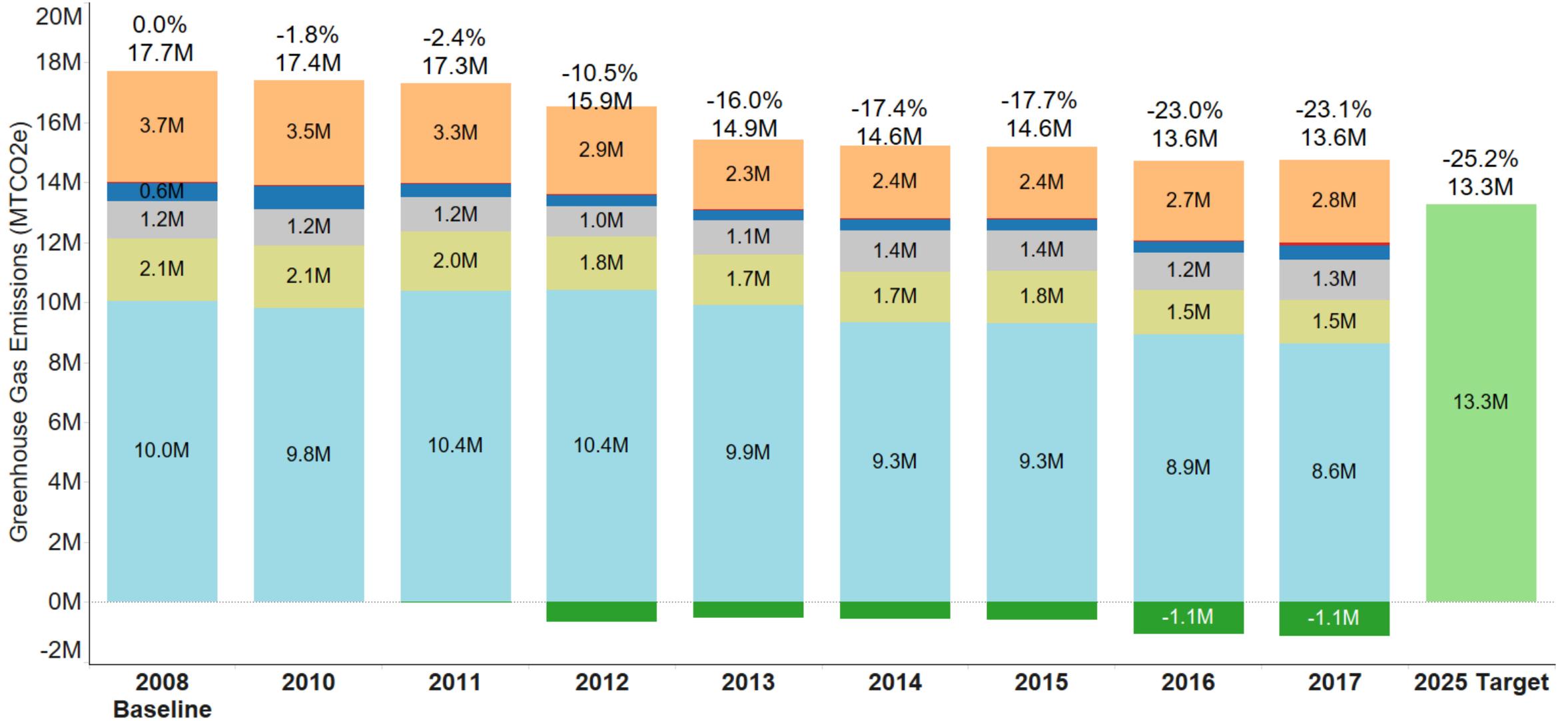
## SCOPE 3:

Greenhouse gas emissions from sources not owned or directly controlled by a Federal agency but related to agency activities.

# Greenhouse Gas Targets and History

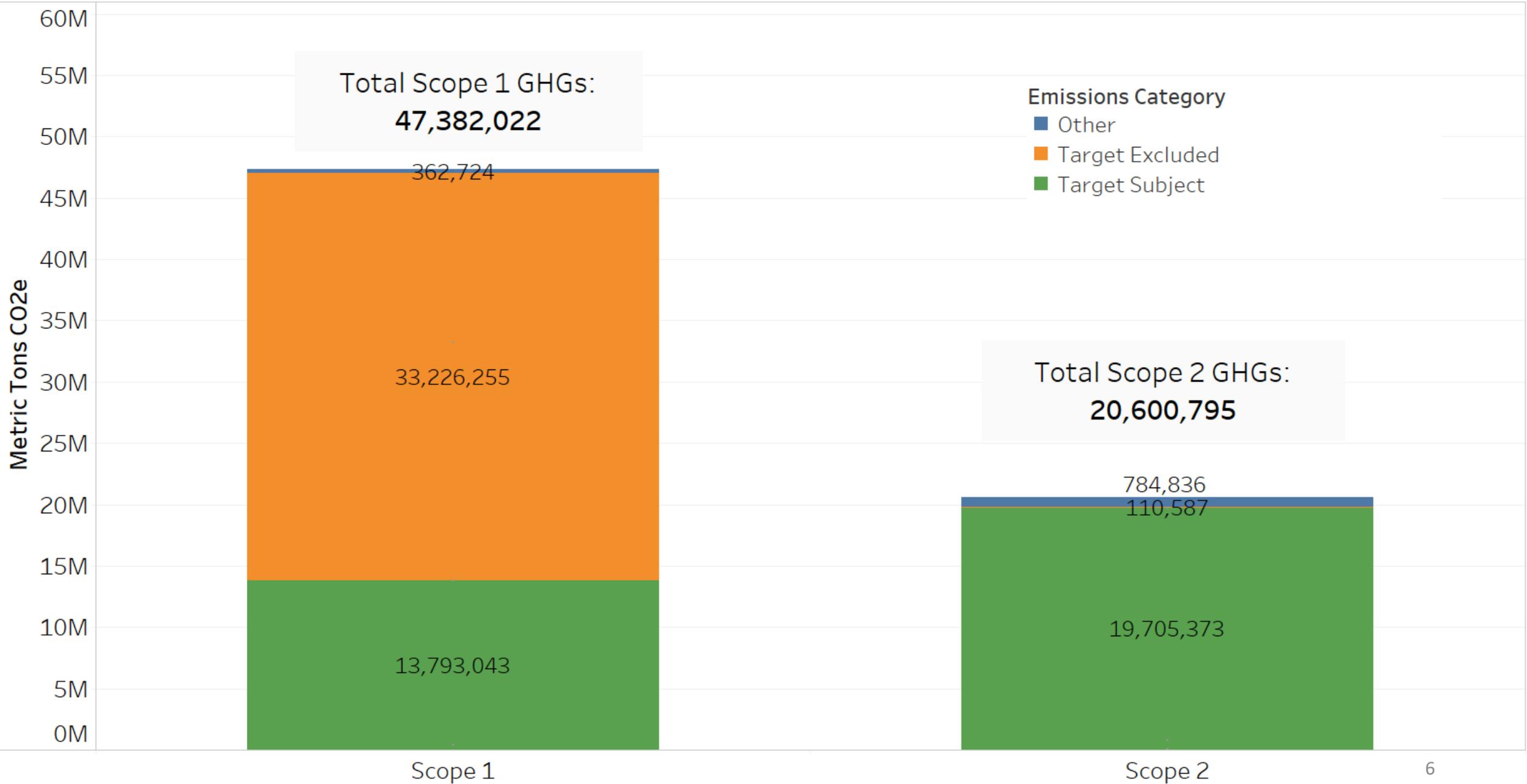
- Executive Order 13123 (June 1999)
  - Federal Government's first-ever goal tied to GHG reductions
  - Required each Federal agency to reduce GHG from energy use in its *buildings* by 30 percent below 1990 levels by 2010
- Executive Order 13514 (October 2009)
  - Established individual agency 2020 targets for combined Scope 1 and 2 emissions and for Scope 3 emissions compared to 2008 baseline
  - Excluded military, law enforcement, emergency and non-road vehicles as well as special request exclusions upon security requests
- Executive Order 13693 (March 2015)
  - Revised agency targets and set target year to 2025, Government-wide targets:
    - 40.9% reduction in 2025 vs 2008 for Scope 1&2 emissions
    - 28.5% reduction in 2025 vs 2008 for Scope 3 emissions
  - Established fleet GHG-per-mile target of 30 percent below 2014 levels by 2025
- Executive Order 13834 (May 2018)
  - Vacated GHG targets established under E.O. 13693
  - “Targeted Emissions” reclassified as “Emissions from Standard Operations”
  - Scope 3 emissions no longer tracked
- Executive Order 14057 (December 2021)
  - 65% reduction in scope 1 and 2 GHG emissions from Federal operations by 2030 from 2008 levels
  - 100% carbon pollution-free electricity on a net annual basis by 2030, including 50% 24/7 carbon pollution-free electricity
  - A net-zero emissions building portfolio by 2045, including a 50% emissions reduction by 2032
  - 100% zero-emission vehicle acquisitions by 2035, including 100% zero emission light-duty vehicle acquisitions by 2027

## Federal Government Progress Toward Scope 3 Greenhouse Gas Reduction Goal



- Business Air Travel
- Contracted Wastewater Treatment
- Business Ground Travel
- Contracted Solid Waste
- Electricity T and D Losses
- Employee Commuting
- Renewable Energy Hosting Credit
- 2025 Scope 3 Target Emissions

# Federal Government FY 2021 Greenhouse Gas Emissions by Emissions Category and Scope

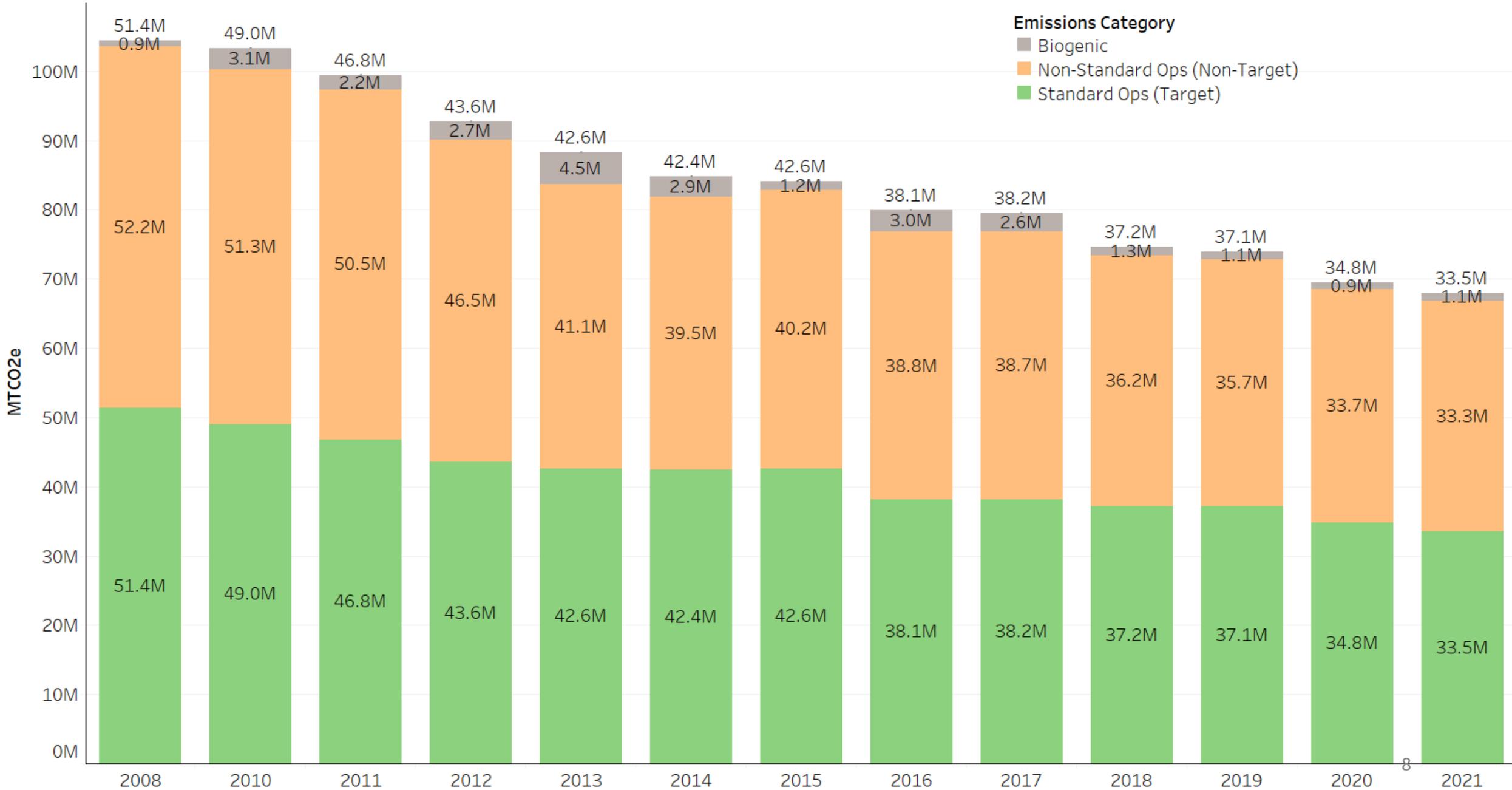


# Greenhouse Gas Inventory (Metric Tons of Carbon Dioxide Equivalent)

Greenhouse Gas Inventory: Government Totals	FY 2021		
Scope and Category	GHG Emissions from Standard Operations (MT CO2e)	GHG Emissions from Non-Standard Operations* (Military Operations, Law Enforcement, and Other) (MT CO2e)	Total Quantity Emitted Biogenic (MT CO2e)
Scope 1: On-Site Fuel Consumption at Federal Facilities	8,615,949.9	6,758.4	230,974.8
Scope 1: Mobile Emissions--Vehicles, Aircraft, Ships, and Equipment	1,323,031.0	32,340,969.1	8,292.5
Scope 1: Mobile Emissions--Passenger Fleet Vehicles	2,677,849.8	551,064.1	46,953.6
Scope 1: Fugitive Emissions--Fugitive Fluorinated Gases and Other Fugitive Emissions	687,582.7	327,463.6	
Scope 1: Fugitive Emissions--On-site Wastewater Treatment	8,840.8		1,540.4
Scope 1: Fugitive Emissions--On-site Landfills and Municipal Solid Waste Facilities	292,996.9		74,962.4
Scope 1: Manufacturing and Industrial Process Emissions	186,792.5	0.0	
<b>Subtotal Scope 1</b>	<b>13,793,043.5</b>	<b>33,226,255.3</b>	<b>362,723.7</b>
Scope 2: Purchased Electricity	19,853,016.8	110,517.9	0.0
Scope 2: Purchased Biomass Energy	9,506.3		784,833.9
Scope 2: Purchased Steam and Hot Water	831,556.3	0.0	0.0
Scope 2: Purchased Chilled Water	40,331.2	0.0	1.6
Scope 2: Purchased Combined Heat and Power Electricity, Steam & Hot Water	37,298.6	0.0	0.0
<b>Subtotal Scope 2</b>	<b>20,771,709.1</b>	<b>110,517.9</b>	<b>784,835.6</b>
Scope 2: Reductions from Renewable Energy Use	-1,066,336.3		0.0
<b>Subtotal Scope 1 &amp; 2</b>	<b>33,498,416.3</b>	<b>33,336,773.2</b>	<b>1,147,559.2</b>

\*Non-Standard Operations are vehicles, vessels, aircraft and other equipment used by Federal Government agencies in combat support, combat service support, tactical or relief operations, training for such operations, law enforcement, emergency response, or spaceflight (including associated ground-support equipment). Non-Standard operations also includes generation of electric power produced and sold commercially to other parties.

# Federal Government Greenhouse Gas Emissions by Category (FY 2008 - FY 2021)



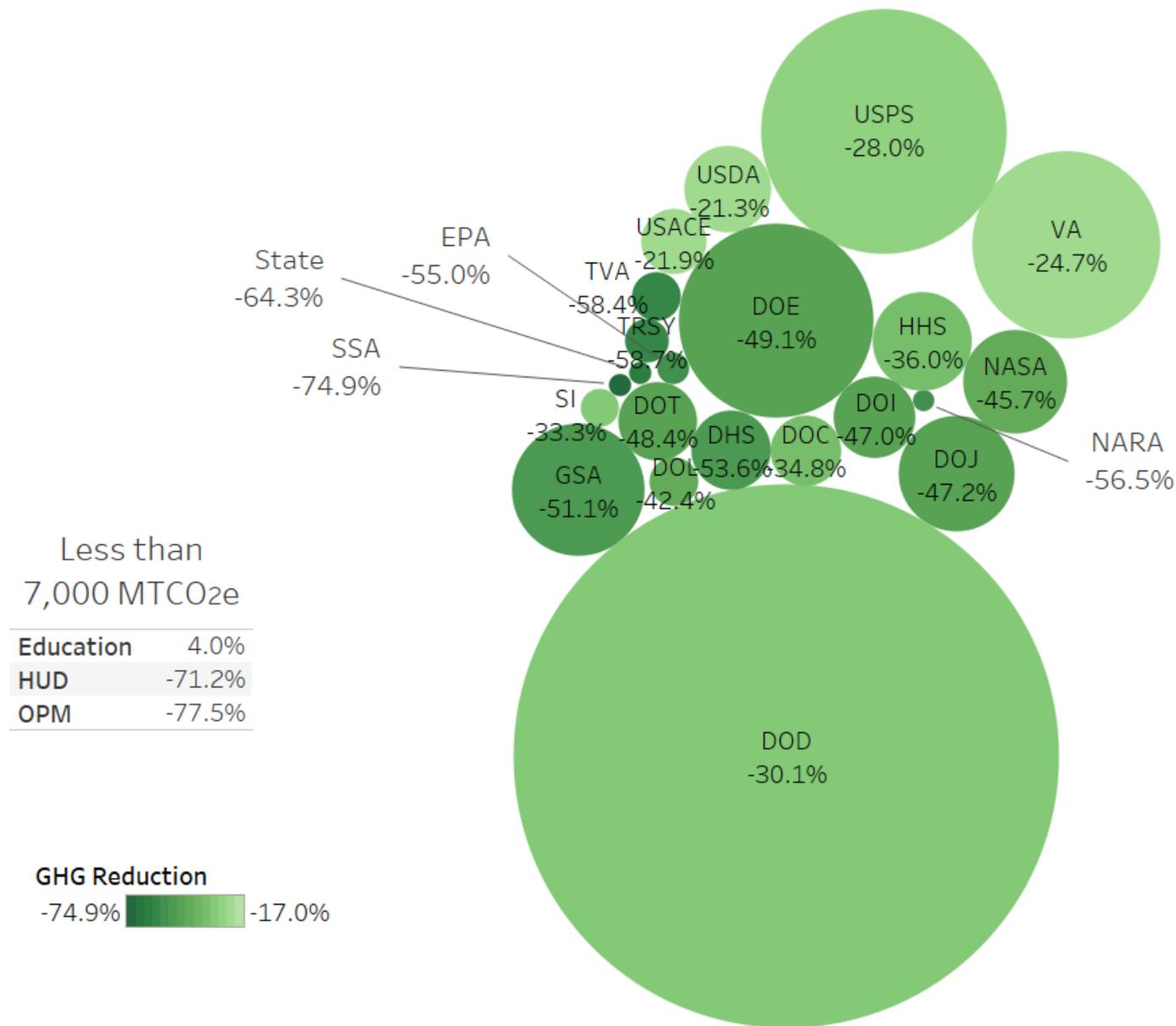
**Federal Government Scope 1 & 2 GHG Emissions from Standard Operations (Targeted Emissions) by Sector and Category, FY 2008 through FY 2021 (Metric Tons of Carbon Dioxide Equivalent)**

**Filters:** Agency: Federal Government  
**GHG Type:** Standard Ops (Target)

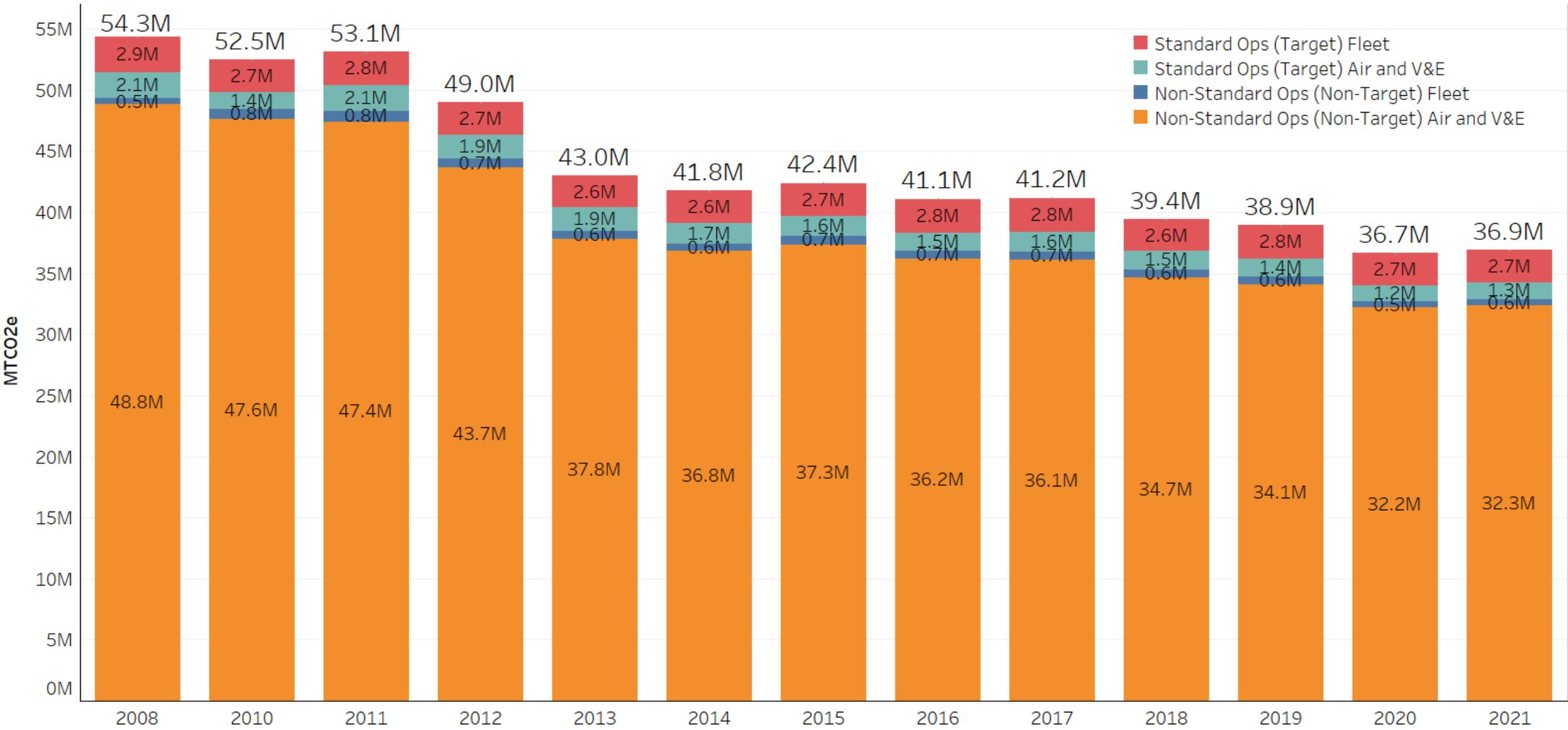
Fiscal Year	Scope 1 Direct Emissions						Scope 2 Indirect Emissions							Sector Subtotals			Scope Subtotals		Total
	Mobility Energy Use		Fugitive Emissions			Facility Energy Use							Mobility Energy Use	Fugitive Emissions	Facility Energy Use	Scope 1 Direct Emissions	Scope 2 Indirect Emissions	Combined Scope 1 and 2 Emissions	
	Aircraft, Ships, Vehicles, and Equipment	Passenger Fleet Vehicles	Fluorinated Gases and Other Fugitive Emissions	On-site Wastewater Treatment	On-site Landfills and Municipal Solid Waste Facilities	Manufacturing and Industrial Process Emissions	On-Site Fuel Combustion	Purchased Electricity	Purchased Biomass Energy	Purchased Steam and Hot Water	Purchased Chilled Water	Purchased Energy from Combined Heat/Power Plants	Renewable Energy Purchases						
2008	2,106,309	2,878,607	1,122,723	12,145	248,676	164,417	11,032,983	32,094,505	245	1,598,381	59,688	69,246	0	<b>4,984,916</b>	<b>1,547,961</b>	<b>44,855,048</b>	<b>17,565,860</b>	<b>33,822,065</b>	<b>51,387,925</b>
2010	1,382,868	2,732,192	837,607	11,746	1,132,202	119,938	10,595,668	31,475,661	18,513	2,330,350	63,932	68,054	-1,790,057	<b>4,115,060</b>	<b>2,101,492</b>	<b>42,762,121</b>	<b>16,812,220</b>	<b>32,166,453</b>	<b>48,978,674</b>
2011	2,087,651	2,774,146	677,278	11,113	285,690	233,950	10,233,212	30,502,020	23,250	1,610,744	74,918	45,884	-1,723,033	<b>4,861,797</b>	<b>1,208,031</b>	<b>40,766,995</b>	<b>16,303,039</b>	<b>30,533,783</b>	<b>46,836,822</b>
2012	1,934,122	2,668,525	684,624	11,534	273,745	180,781	9,434,824	28,460,925	31,863	1,466,456	69,435	11,434	-1,673,205	<b>4,602,647</b>	<b>1,150,684</b>	<b>37,801,732</b>	<b>15,188,155</b>	<b>28,366,907</b>	<b>43,555,062</b>
2013	1,898,335	2,642,956	1,062,918	11,806	271,059	156,168	9,438,491	27,509,845	62,885	1,777,331	59,491	12,422	-2,294,609	<b>4,541,291</b>	<b>1,501,951</b>	<b>36,565,856</b>	<b>15,481,732</b>	<b>27,127,365</b>	<b>42,609,097</b>
2014	1,671,220	2,649,828	863,726	13,277	317,717	149,079	9,589,175	27,601,397	29,463	1,375,943	58,870	11,205	-1,900,845	<b>4,321,048</b>	<b>1,343,799</b>	<b>36,765,208</b>	<b>15,254,022</b>	<b>27,176,033</b>	<b>42,430,055</b>
2015	1,625,843	2,730,702	1,013,000	13,663	330,302	162,559	9,236,669	27,981,994	12,524	1,129,458	68,466	58,894	-1,745,001	<b>4,356,545</b>	<b>1,519,524</b>	<b>36,743,003</b>	<b>15,112,738</b>	<b>27,506,334</b>	<b>42,619,072</b>
2016	1,489,285	2,784,483	1,092,369	12,724	327,572	154,588	8,454,325	25,674,609	30,324	1,140,967	50,818	16,854	-3,128,821	<b>4,273,768</b>	<b>1,587,254</b>	<b>32,239,076</b>	<b>14,315,347</b>	<b>23,784,751</b>	<b>38,100,098</b>
2017	1,622,137	2,767,537	817,070	12,782	321,601	233,003	8,315,643	24,511,726	22,515	998,680	57,340	52,851	-1,556,778	<b>4,389,673</b>	<b>1,384,456</b>	<b>32,401,976</b>	<b>14,089,773</b>	<b>24,086,333</b>	<b>38,176,106</b>
2018	1,484,882	2,641,431	842,805	11,249	187,290	235,741	8,690,560	23,199,790	10,313	1,015,938	57,470	44,372	-1,186,554	<b>4,126,314</b>	<b>1,277,086</b>	<b>31,831,888</b>	<b>14,093,959</b>	<b>23,141,328</b>	<b>37,235,287</b>
2019	1,427,282	2,755,239	719,915	13,635	305,337	210,720	8,812,253	22,888,968	7,657	874,353	49,892	51,002	-972,862	<b>4,182,521</b>	<b>1,249,607</b>	<b>31,711,262</b>	<b>14,244,381</b>	<b>22,899,009</b>	<b>37,143,390</b>
2020	1,224,797	2,719,280	716,230	13,248	308,009	233,384	8,625,648	21,020,254	6,878	834,363	48,716	40,816	-959,611	<b>3,944,077</b>	<b>1,270,870</b>	<b>29,617,064</b>	<b>13,840,595</b>	<b>20,991,416</b>	<b>34,832,012</b>
2021	1,323,031	2,677,850	687,583	8,841	292,997	186,792	8,615,950	19,853,017	9,506	831,556	40,331	37,299	-1,066,336	<b>4,000,881</b>	<b>1,176,213</b>	<b>28,321,323</b>	<b>13,793,043</b>	<b>19,705,373</b>	<b>33,498,416</b>

%Change vs. FY 2008	-37.2%	-7.0%	-38.8%	-27.2%	17.8%	13.6%	-21.9%	-38.1%	3,772.6%	-48.0%	-32.4%	-46.1%		<b>-19.7%</b>	<b>-24.0%</b>	<b>-36.9%</b>	<b>-21.5%</b>	<b>-41.7%</b>	<b>-34.8%</b>
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# 2021 Target Greenhouse Gas Emissions: 33.5 Million Metric Tons of Carbon Dioxide Equivalent (MTCO<sub>2</sub>e) with Reduction Percentage versus 2008



# Federal Government Mobility Emissions (FY 2008 - FY 2021)

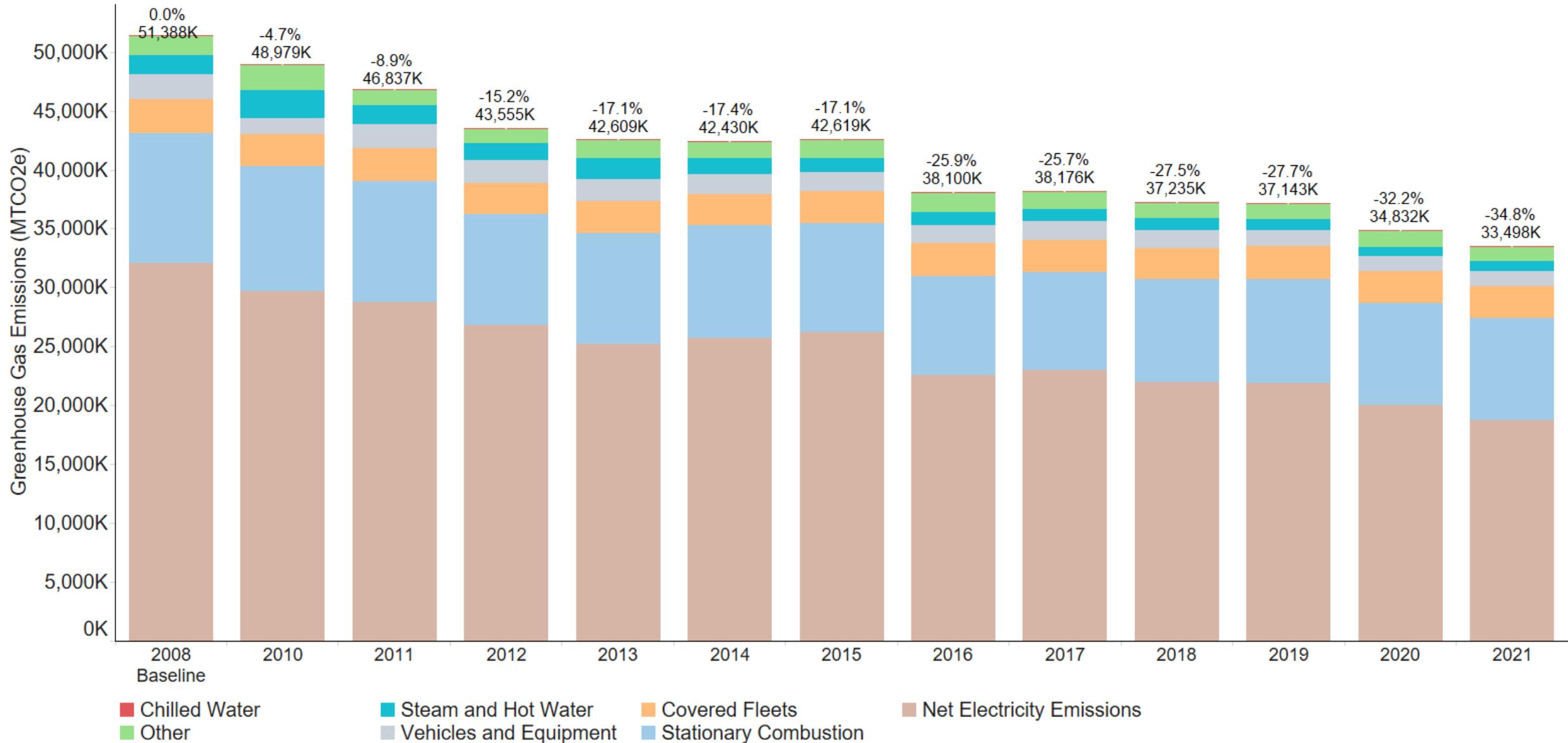


## Targeted GHG Trends by Sector and Scope

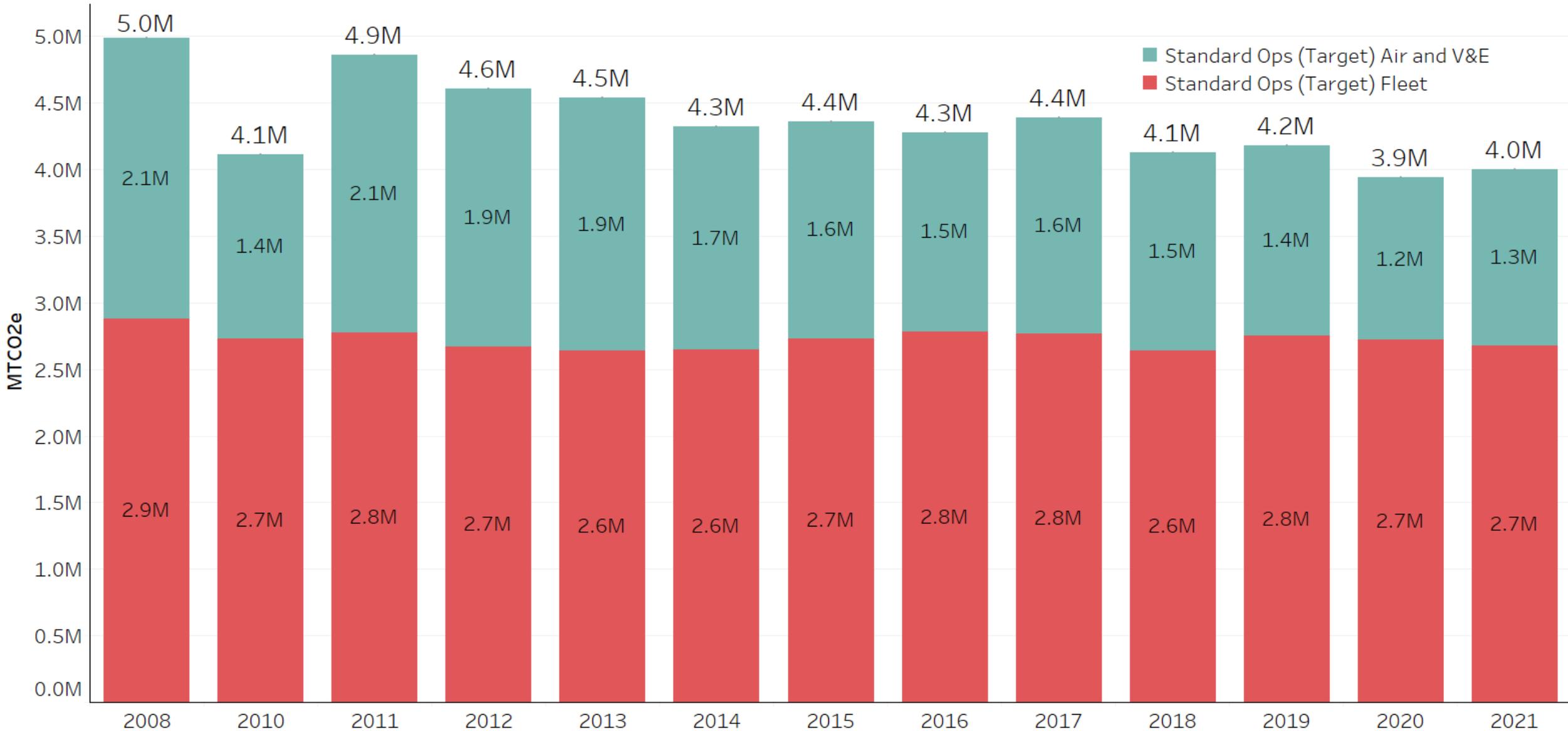
Fiscal Year	Sector Subtotals			Scope Subtotals		Total
	Mobility Energy Use	Fugitive Emissions	Facility Energy Use	Scope 1 Direct Emissions	Scope 2 Indirect Emissions	Combined Scope 1 and 2 Emissions
2008	4,984,916	1,547,961	44,855,048	17,565,860	33,822,065	51,387,925
2010	4,115,060	2,101,492	42,762,121	16,812,220	32,166,453	48,978,674
2011	4,861,797	1,208,031	40,766,995	16,303,039	30,533,783	46,836,822
2012	4,602,647	1,150,684	37,801,732	15,188,155	28,366,907	43,555,062
2013	4,541,291	1,501,951	36,565,856	15,481,732	27,127,365	42,609,097
2014	4,321,048	1,343,799	36,765,208	15,254,022	27,176,033	42,430,055
2015	4,356,545	1,519,524	36,743,003	15,112,738	27,506,334	42,619,072
2016	4,273,768	1,587,254	32,239,076	14,315,347	23,784,751	38,100,098
2017	4,389,673	1,384,456	32,401,976	14,089,773	24,086,333	38,176,106
2018	4,126,314	1,277,086	31,831,888	14,093,959	23,141,328	37,235,287
2019	4,182,521	1,249,607	31,711,262	14,244,381	22,899,009	37,143,390
2020	3,944,077	1,270,870	29,617,064	13,840,595	20,991,416	34,832,012
2021	4,000,881	1,176,213	28,321,323	13,793,043	19,705,373	33,498,416

%Change vs.FY 2008	-19.7%	-24.0%	-36.9%	-21.5%	-41.7%	-34.8%
%Change vs.FY 2020	1.4%	-7.4%	-4.4%	-0.3%	-6.1%	-3.8%

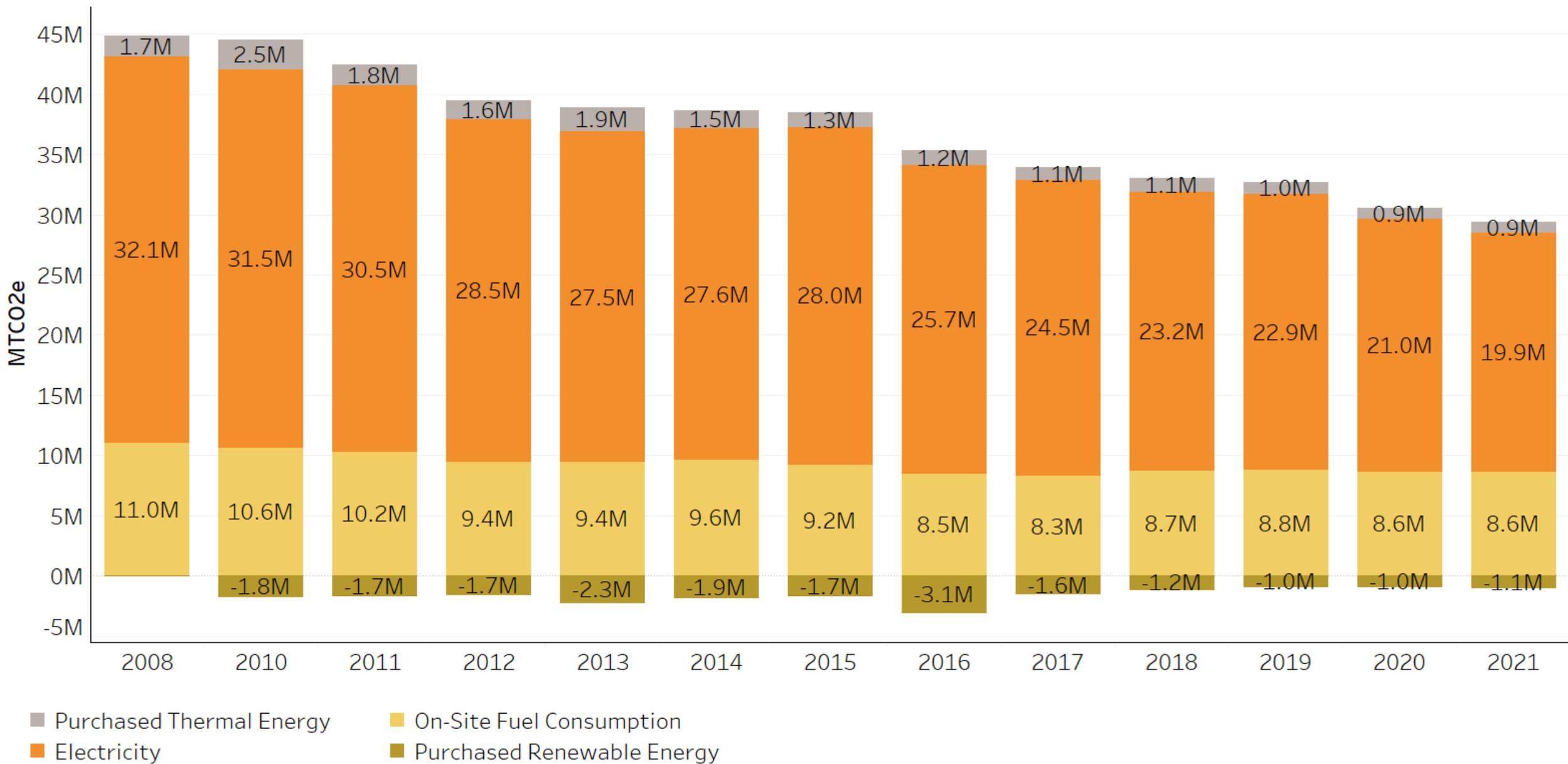
# Federal Government Scope 1 and 2 Greenhouse Gas Emissions from Standard Operations



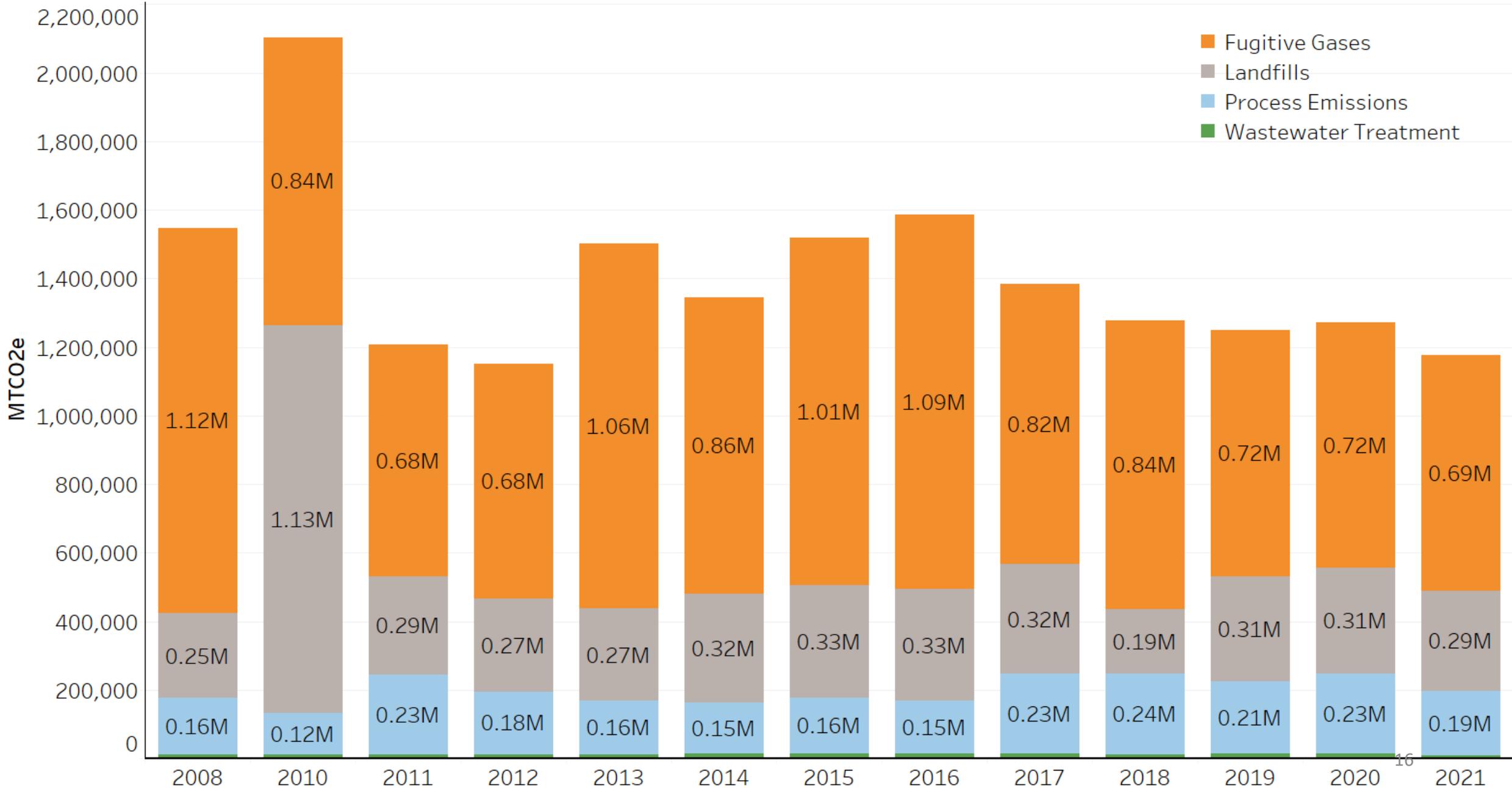
## Federal Government Target Mobility Emissions (FY 2008 - FY 2021)



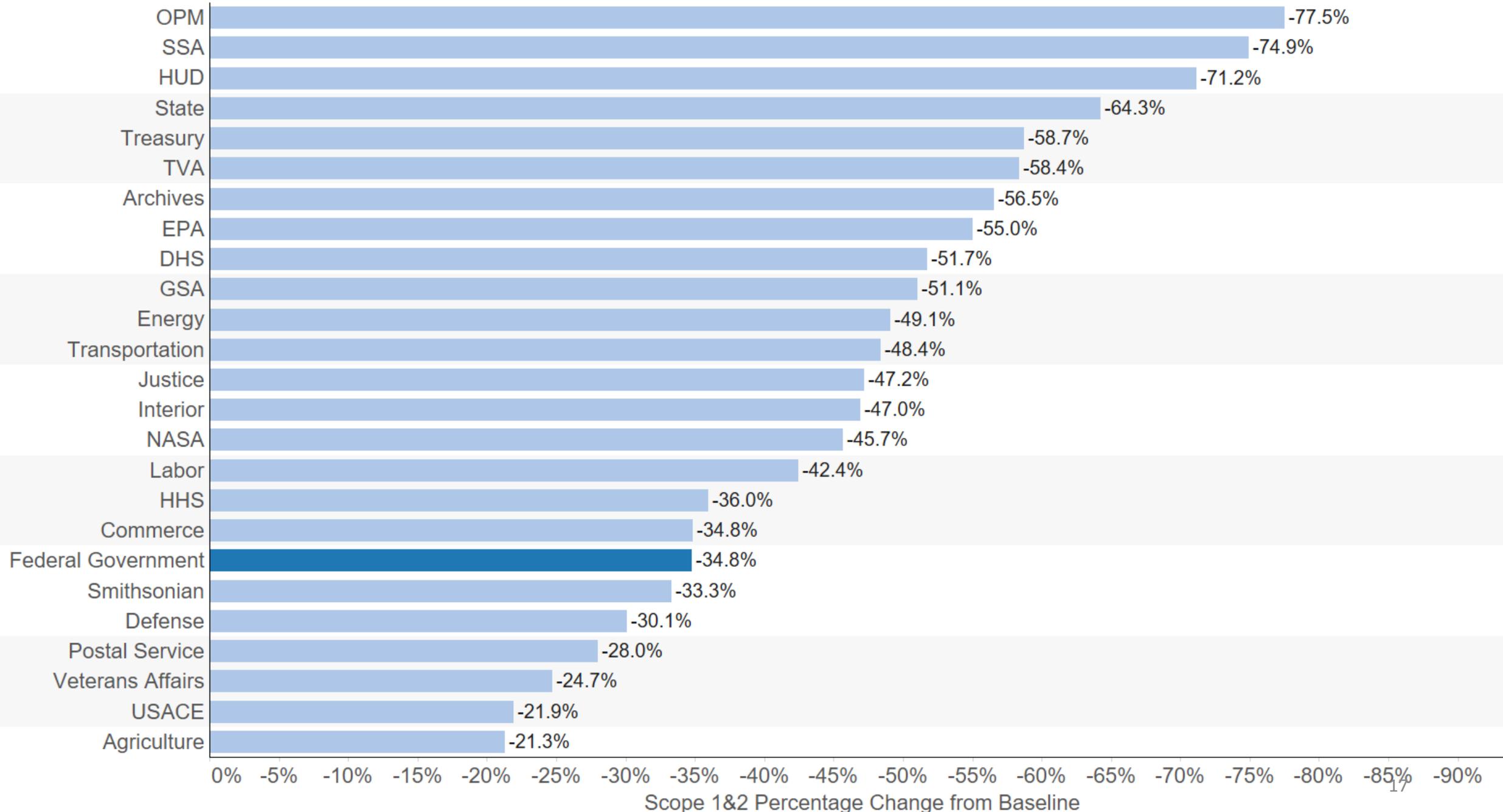
# Federal Government Facility Scope 1 & 2 Greenhouse Gas Emissions from Energy Use (FY 2008 - FY 2021)



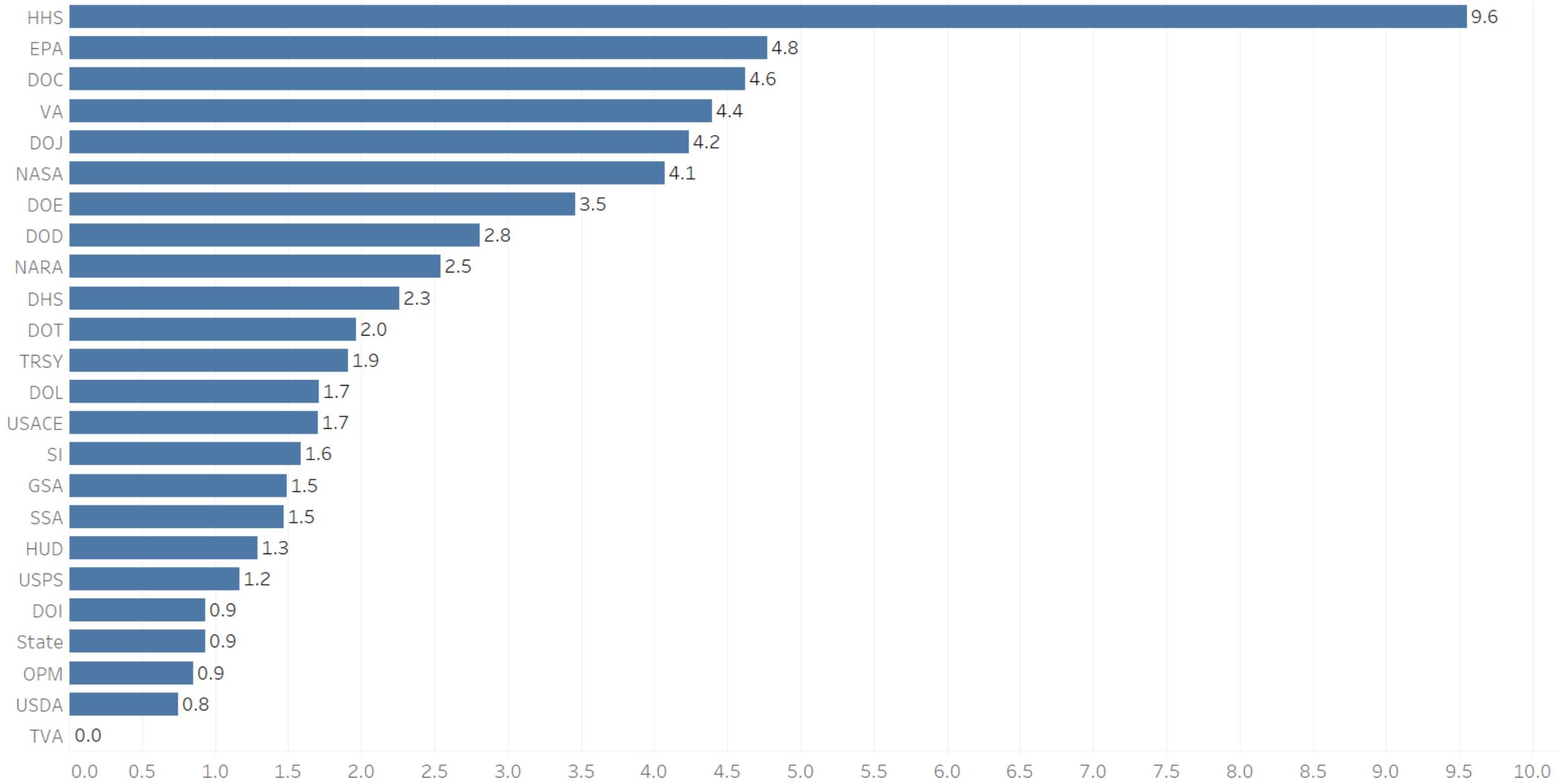
# Federal Government Scope 1 Fugitive and Process Greenhouse Gas Emissions (FY 2008 - FY 2021)



# Percentage Reduction in Scope 1 and 2 GHG Emissions FY 2008 - FY 2021



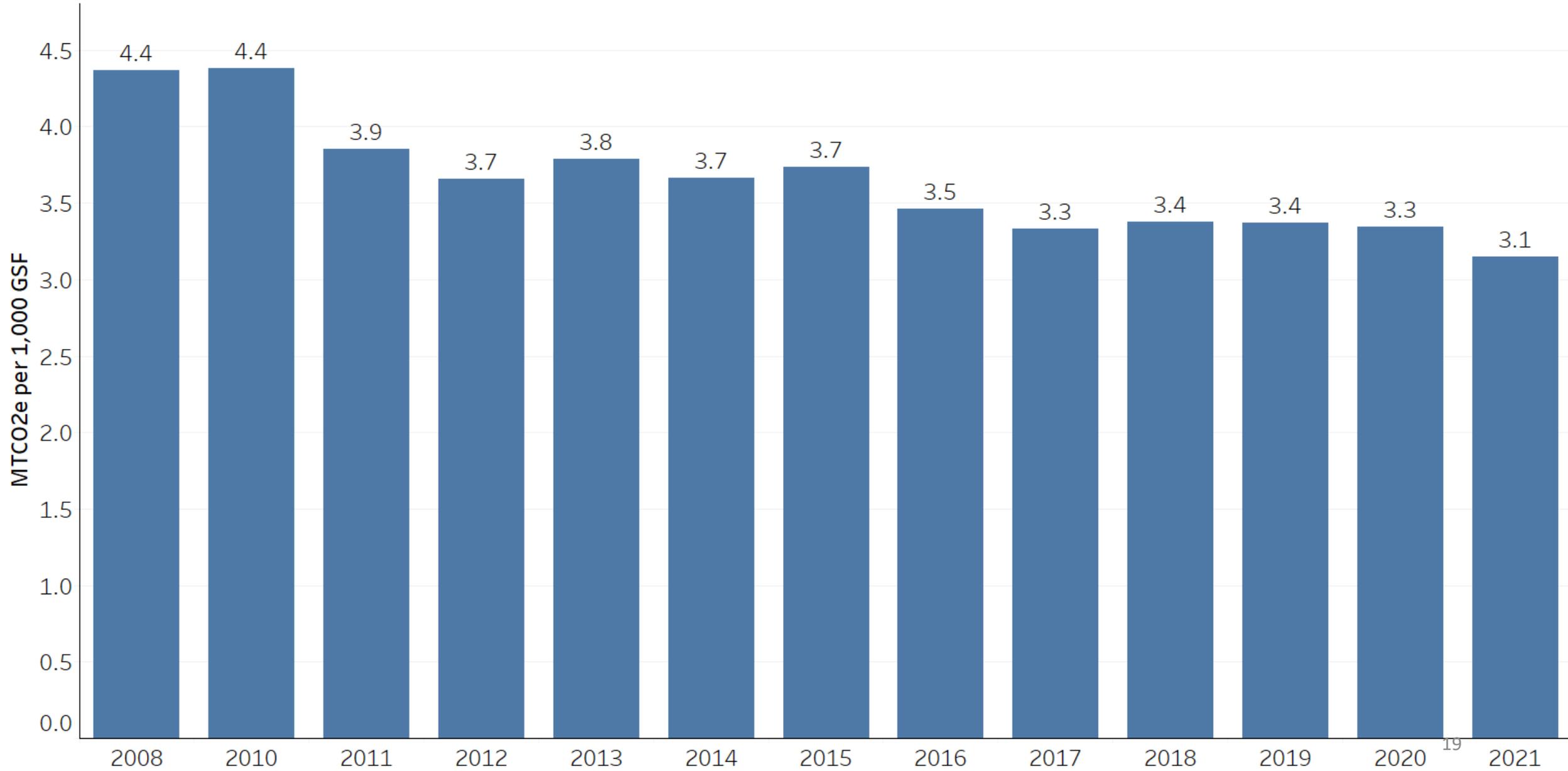
# FY 2021 Scope 1 Facility Direct GHG Emissions Intensity by Agency



Scope 1 Facility Direct Emissions (MTCO2e per 1,000 GSF)

# Federal Government Facility Scope 1 GHG Emissions Intensity

MTCO<sub>2</sub>e per 1,000 GSF (Standard Operation Emissions from Energy per Total GSF)



# Federal Government Actual and Projected GHG Emissions from Standard Operations per E.O. 14057 Goals

