

CO₂ Emissions Factors

CO2 Emissions Factors (MTCO ₂ /BBtu)	Default	Alternative Emissions Factors
Electricity	187.97	187.97
Fuel Oil	73.15	73.15
Natural Gas	53.06	53.06
LPG/Propane	62.28	62.28
Coal	95.35	95.35
Purch. Steam	86.85	86.85
Other (assumes chilled water)	72.58	72.58

Transportation CO2 Emissions Factors (kg CO ₂ /GEG)	Emissions Factors
Biodiesel	9.32
Diesel	8.85
Electric	0.00
E-85	8.74
Gasoline	8.81
Hydrogen	0.00
M-85	NA
LPG	7.82
CNG	6.53
LNG	6.78

Transportation CO2 Emissions Factors	Gallons Gasoline Equivalent (GGE)	Fuel-Specific Original Unit		Emission factor (kg CO2/original unit)	Emission factor (kg CO2/GGE)
Biodiesel	1.00	0.99	Gallon	9.46	9.32
Diesel	1.00	0.87	Gallon	10.15	8.85
Electric	1.00	33.33	KWh	0	0.00
E-85	1.00	1.39	Gallon	6.295	8.74
Gasoline	1.00	1.00	Gallon	8.81	8.81
Hydrogen	1.00	1.00	Kilogram	0	0.00
M-85	NA	NA	Gallon	NA	NA
LPG	1.00	1.35	Gallon	5.79	7.82
CNG	1.00	120.97	cubic ft.	0.054	6.53
LNG	1.00	1.52	Gallon	4.46	6.78

CNG GGE Calculations:

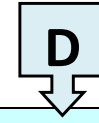
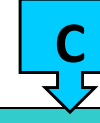
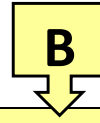
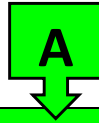
5,218,000 Btu/Barrel of Gasoline
124,238 Btu/Gallon of Gasoline
1027 Btu/cubic foot of natural gas
120.97 Cubic feet/Gallon Gasoline

AGENCY GREENHOUSE GAS REDUCTION TARGETING TOOL

Detailed Energy and CO2 Data

Agency: NRC
 Date: 24-Dec-09

Prepared by: Sundar Shankar
 Phone: 301-415-5417



NECPA / E.O. 13423 Goal Subject Facilities	FY 2008			FY 2015 Goals Met <small>(EISA 30% reduction goal, 7.5% renewables, FY 2008 Fuel Mix)</small>			Adjustments for FY 2020 Scenario			FY 2020 Target			
	Annual Consumption	Site-Delivered Btu (Billion)	Est. GHG Emissions (MTCO2e)	Annual Consumption	Site-Delivered Btu (Billion)	Est. GHG Emissions (MTCO2e)	Percent Change from Goals Met Projection (B)	Annual Consumption	Site-Delivered Btu (Billion)	Est. GHG Emissions (MTCO2e)	Annual Consumption	Site-Delivered Btu (Billion)	Est. GHG Emissions (MTCO2e)
Electricity (MWH)	25,720.4	87.8	16,496	16,744.7	57.1	10,739	47%	24,614.7	84.0	15,787	24,614.7	84.0	15,787
Fuel Oil (1,000 Gal)	0.8	0.1	9	0.6	0.1	6	47%	0.8	0.1	8	0.8	0.1	8
Natural Gas (1,000 Cubic Ft)	704.8	0.7	39	463.1	0.5	25	47%	680.7	0.7	37	680.7	0.7	37
LPG/Propane (1,000 Gal)	0.0	0.0	0	0.0	0.0	0	9.0	0.0	0.0	0	0.0	0.0	0
Coal (Short Tons)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
Purchased Steam (BBtu)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
Other (BBtu)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
REC Purchases (MWH)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
Renew. Electric. (MWH)	771.6	2.6		652.4	2.2		0%	652.4	2.2	0	652.4	2.2	
Renew. Other (BBtu)	0.0	0.0		0.0	0.0		N/A	0.0	0.0	0	0.0	0.0	
TOTAL		91.2	16,543		59.9	10,770	45.3%		87.0	15,832		87.0	15,832
Facility Area (1,000 Gross Square Feet)	763.4			763.4			47%	1,122.2			1,122.2		

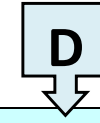
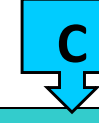
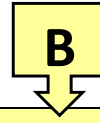
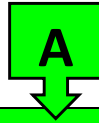
NECPA / E.O. 13423 Goal Excluded Facilities	FY 2008			FY 2015 Goals Met <small>(Assumes 5% reduction from FY 2008)</small>			Adjustments for FY 2020 Scenario			FY 2020 Target			
	Annual Consumption	Site-Delivered Btu (Billion)	Est. GHG Emissions (MTCO2e)	Annual Consumption	Site-Delivered Btu (Billion)	Est. GHG Emissions (MTCO2e)	Percent Change from Goals Met Projection (B)	Annual Consumption	Site-Delivered Btu (Billion)	Est. GHG Emissions (MTCO2e)	Annual Consumption	Site-Delivered Btu (Billion)	Est. GHG Emissions (MTCO2e)
Electricity (MWH)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
Fuel Oil (1,000 Gal)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
Natural Gas (1,000 Cubic Ft)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
LPG/Propane (1,000 Gal)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
Coal (Short Tons)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
Purchased Steam (BBtu)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
Other (BBtu)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
REC Purchases (MWH)	0.0	0.0	0	0.0	0.0	0	N/A	0.0	0.0	0	0.0	0.0	0
Renew. Electric. (MWH)	0.0	0.0		0.0	0.0		N/A	0.0	0.0	0	0.0	0.0	
Renew. Other (BBtu)	0.0	0.0		0.0	0.0		N/A	0.0	0.0	0	0.0	0.0	
TOTAL		0.0	0		0.0	0	#DIV/0!		0.0	0		0.0	0
Facility Area (1,000 Gross Square Feet)	0.0			0.0			0%	0.0			0.0		

AGENCY GREENHOUSE GAS REDUCTION TARGETING TOOL

Detailed Energy and CO2 Data

Agency: NRC
 Date: 24-Dec-09

Prepared by: Sundar Shankar
 Phone: 301-415-5417



NECPA / E.O. 13423 Goal Subject Facilities	FY 2008	FY 2015 Goals Met <small>(EISA 30% reduction goal, 7.5% renewables, FY 2008 Fuel Mix)</small>	Adjustments for FY 2020 Scenario	FY 2020 Target
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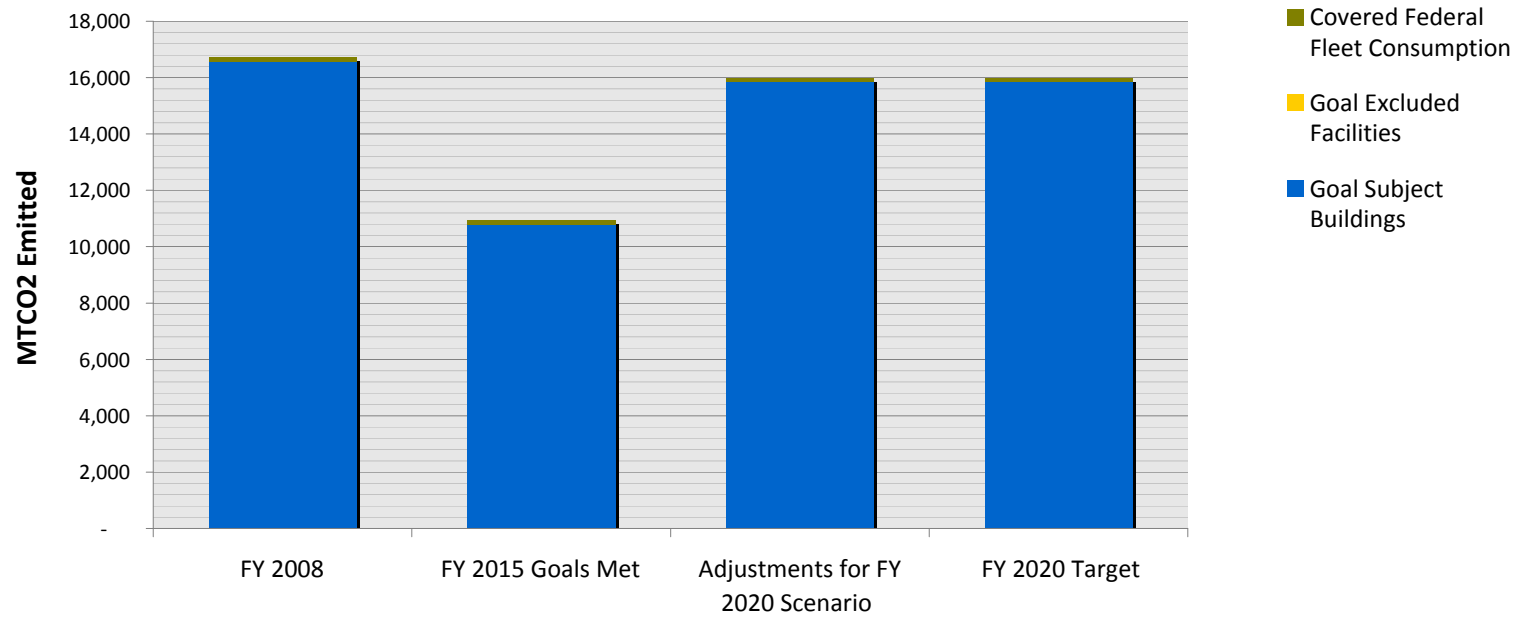
Renewable Energy Summary	REC Purchases (MWH)	-	REC Purchases (MWH)	0		REC Purchases (MWH)	0	REC Purchases (MWH)	0
	Renewable Elec. Purchases (MWH)	772	Renewable Elec. Purchases (MWH)	652		Renewable Elec. Purchases (MWH)	652	Renewable Elect. Purchases (MWH)	652
	On-Site Renewable Electricity Generation (MWH)	0.0	On-Site Renewable Electricity Generation (MWH)	326	0%	On-Site Renewable Electricity Generation (MWH)	326	On-Site Renewable Electricity Generation (MWH)	326
	Bonus for RE Generation (MWH)	0.0	Bonus for RE Generation (MWH)	326	0%	Bonus for RE Generation (MWH)	326	Bonus for RE Generation (MWH)	326
	Renewable Electricity Total (MWH)	771.6	Renewable Electricity Total (MWH)	1,305		Renewable Electricity Total (MWH)	1,305	Renewable Electricity Total (MWH)	1,305
	Percentage Renewable Electricity	2.9%	Percentage Renewable Electricity	7.5%		Percentage Renewable Electricity	5.2%	Percentage Renewable Electricity	5.2%
	Non-Electric Renewable (BBtu)	0.0	Non-Electric Renewable (BBtu)	0.0		Non-Electric Renewable (BBtu)	0.0	Non-Electric Renewable (BBtu)	0.0
	Total Electricity Percentage of BBtu	99.1%	Total Electricity BBtu	59		Total Electricity BBtu	86	Total Electricity BBtu	86

Covered Federal Fleet Consumption	FY 2008			FY 2015 Goals Met <small>(20% reduction from 2005 petroleum use, 10% increase per year of alt. fuel from 2005)</small>			Adjustments for FY 2020 Scenario			FY 2020 Target			
Fuel Type	Annual Consumption (GGE)	Btu (Billion)	Est. GHG Emissions (MTCO2e)	Annual Consumption (GGE)	Btu (Billion)	Est. GHG Emissions (MTCO2e)	Percent Change from Goals Met Projection (B)	Annual Consumption (GGE)	Btu (Billion)	Est. GHG Emissions (MTCO2e)	Annual Consumption (GGE)	Btu (Billion)	Est. GHG Emissions (MTCO2e)
Biodiesel	0.0	0.0	0	0.0	0.0	0.0	N/A	0.0	0.0	0	0.0	0.0	0
Diesel	4,023.0	0.5	36	3,019.6	0.4	26.7	N/A	2,717.7	0.3	24	2,717.7	0.3	24
Electric	0.0	0.0	0	0.0	0.0	0.0	N/A	0.0	0.0	0	0.0	0.0	0
E-85	8,502.0	1.1	74	10,170.1	1.3	88.9	N/A	9,153.1	1.1	80	9,153.1	1.1	80
Gasoline	6,015.0	0.7	53	4,514.8	0.6	39.8	N/A	4,063.3	0.5	36	4,063.3	0.5	36
Hydrogen	0.0	0.0	0	0.0	0.0	0.0	N/A	0.0	0.0	0	0.0	0.0	0
M-85	0.0	0.0	0	0.0	0.0	0.0	N/A	0.0	0.0	0	0.0	0.0	0
LPG	0.0	0.0	0	0.0	0.0	0.0	N/A	0.0	0.0	0	0.0	0.0	0
CNG	0.0	0.0	0	0.0	0.0	0.0	N/A	0.0	0.0	0	0.0	0.0	0
LNG	0.0	0.0	0	0.0	0.0	0.0	N/A	0.0	0.0	0	0.0	0.0	0
TOTAL	18,540.0	2.3	163	17,704.5	2.2	155		15,934.0	2.0	140	15,934.0	2.0	140

CO₂ Estimates Summary: FY 2008, FY 2015 Goals Met Projection, and FY 2020 Goal Target NRC

CO ₂ Emissions Summary (MTCO ₂ e Emitted)	FY 2008	FY 2015 Goals Met	Adjustments for FY 2020 Scenario	FY 2020 Target
Goal Subject Buildings	16,543	10,770	15,832	15,832
Goal Excluded Facilities	-	-	0	0
Covered Federal Fleet Consumption	163	155	140	140
Total	16,706	10,926	15,972	15,972

CO ₂ Savings from 2008 (MTCO ₂ e)	FY 2015 Goals Met		Adjustments for FY 2020 Scenario		FY 2020 Target	
	Tons Reduced	Percent Reduction	Tons Reduced	Percent Reduction	Tons Reduced	Percent Reduction
Goal Subject Buildings	5,773	34.9%	711	4.3%	711	4.3%
Goal Excluded Facilities	-	#DIV/0!	-	#DIV/0!	-	#DIV/0!
Covered Federal Fleet Consumption	8	4.6%	23	14.1%	23	14.1%
Total	5,780	34.6%	734	4.4%	734	4.4%



FY 2020 Notional Charts

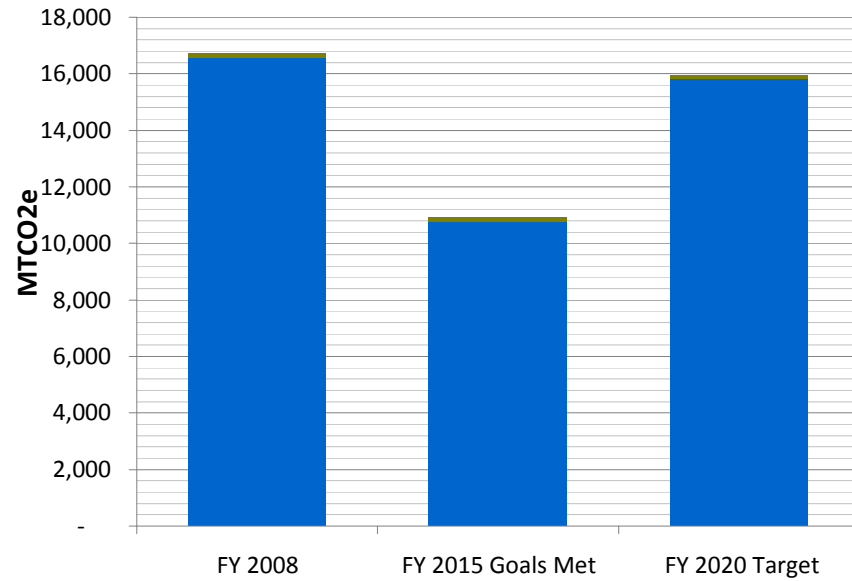
CO2 Emissions Summary (MTCO2e Emittied)	FY 2008	FY 2015 Goals Met	FY 2020 Target
Goal Subject Buildings	16,543	10,770	15,832
Goal Excluded Facilities	-	-	-
Fed. Fleet Consumption	163	155	140
Total	16,706	10,926	15,972

Use Scroll Bars to Modify FY 2020 Target	MTCO2e	% Change From FY 2008
<input type="text" value="15,832"/>	15,832	-4%
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	<u>15,972</u>	<u>-4%</u>

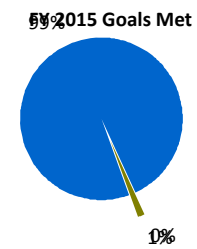
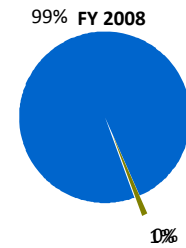
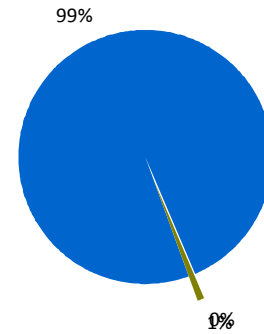
NOTE: This sheet is for speculative purposes only. Manipulation of the 2020 target year data in this sheet only affects the charts on this sheet. This optional sheet is only intended to be used as a high level visual aid to assist agencies in communicating concepts to senior leadership.

- Fed. Fleet Consumption
- Goal Excluded Facilities
- Goal Subject Buildings

Total MTCO2e Emissions



FY 2020 Target - % Emissions per Category



Summary of Inputs

Input Summary	2003	2008	FY 2015 Goals Met	Adjustments for FY 2020 Scenario	FY 2020 Target
Goal Subject Building GSF		763	763	1,122	1,122
Goal Subject Building BBtu		91	60	87	87
Goal Subject Building Btu/GSF	112,117	119,511	78,482	77,550	77,550
Goal Subject RECs (MWH)		0	0	0	0
Goal Excluded Facility GSF		0	0	0	0
Goal Excluded Facility BBtu		0	0	0	0
Goal Excluded Facility Btu/GSF	na	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Goal Excluded RECs (MWH)		0	0	0	0
Renewable Electricity + RECS (percent of total electricity)		2.9%	7.5%	5.2%	5.2%

Building Fuel Mix Assumptions	2008 Goal Building	FY 2015 Goals Met	Adjustments for FY 2020 Scenario	FY 2020 Target	2008 Excluded Facility	Excluded FY 2015 Goals Met	Excluded Adjustments for FY 2020	Excluded FY 2020 Target
Electricity	96.2%	95.4%	96.5%	96.5%	0.0%	0.0%	0.0%	#DIV/0!
Fuel Oil	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	#DIV/0!
Natural Gas	0.8%	0.8%	0.8%	0.8%	0.0%	0.0%	0.0%	#DIV/0!
LPG/Propane	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	#DIV/0!
Coal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	#DIV/0!
Purch. Steam	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	#DIV/0!
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	#DIV/0!
Purch. Renew. Electric.	2.9%	3.7%	2.6%	2.6%	0.0%	0.0%	0.0%	#DIV/0!
Purch. Renew. Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	#DIV/0!
Total Electricity	99.1%	99.1%	99.1%	99.1%	0.0%	0.0%	0.0%	#DIV/0!
Total (must equal 100%)	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	#DIV/0!

Transportation Fuel Mix	2008	FY 2015 Goals Met	Adjustments for FY 2020 Scenario	FY 2020 Target
Biodiesel	0.0%	0.0%	0.0%	0.0%
Diesel	21.7%	17.0%	17.1%	17.1%
Electric	0.0%	0.0%	0.0%	0.0%
E-85	45.8%	57.4%	57.4%	57.4%
Gasoline	32.4%	25.5%	25.5%	25.5%
Hydrogen	0.0%	0.0%	0.0%	0.0%
M-85	0.0%	0.0%	0.0%	0.0%
LPG	0.0%	0.0%	0.0%	0.0%
CNG	0.0%	0.0%	0.0%	0.0%
LNG	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%

Facility Energy Intensity Breakdown		Gross Sq. Ft.	Total Btu (Billion)	Energy Intensity (Btu/GSF)
FY 2008	Goal Subject Buildings	763	91	119,511
	Goal Excluded Facilities	-	0	#DIV/0!
	Total	763	91	119,511
FY 2015 Goals Met	Goal Subject Buildings	763	60	78,482
	Goal Excluded Facilities	-	-	#DIV/0!
	Total	763	60	78,482
Adjustments for FY 2020 Scenario	Goal Subject Buildings	1,122	87	77,550
	Goal Excluded Facilities	-	0	#DIV/0!
	Total	1,122	87	77,550
Alternative FY 2020 Scenario D	Goal Subject Buildings	1,122	87	77,550
	Goal Excluded Facilities	-	-	#DIV/0!
	Total	1,122	87	77,550

Transportation Fuel Mix Assumptions (relative allocation--petro and alt fuels should both total 100%)	2008	FY 2015 Goals Met	Adjustments for FY 2020 Scenario	FY 2020 Target
Biodiesel	0.0%	0.0%	0.0%	0.0%
Diesel	40.1%	40.1%	40.1%	40.1%
Electric	0.0%	0.0%	0.0%	0.0%
E-85	100.0%	100.0%	100.0%	100.0%
Gasoline	59.9%	59.9%	59.9%	59.9%
Hydrogen	0.0%	0.0%	0.0%	0.0%
M-85	0.0%	0.0%	0.0%	0.0%
LPG	0.0%	0.0%	0.0%	0.0%
CNG	0.0%	0.0%	0.0%	0.0%
LNG	0.0%	0.0%	0.0%	0.0%
Total	200.0%	200.0%	200.0%	200.0%

Legend

Item	Description
Input Cell	denotes an area where information can be inputted by the user
Renewable Energy	denotes a "Renewable Energy" energy usage category
FY 2008	indicates information pertaining to data submitted by agencies for Fiscal Year 2008
FY 2015 Goals Met	indicates information pertaining to speculative calculations based on FY 2008 data and mandated EE and RE target:
Adjustments for FY 2020 Scenario	scenario based on user adjusted percentage changes from default 2020 scenario
FY 2020 Target	represents projection data inputted by user based on available estimations of corresponding metrics (not applicable to some agencies)
BBtu	Billion British Thermal Units
Btu	British Thermal Units
GSF	Gross Square Feet
MTCO ₂ e	Metric Tons of Carbon Dioxide Equivalent