

Bernards Townships Carbon Footprint

Bernards Township has calculated the Carbon Footprint for 2015 and compared the results to 2010. The calculation includes every municipal facility, including the Sewerage Authority, all street lights, traffic signals and fleet data. The results indicate a significant overall reduction in Total Emissions (Metric Tons CO₂e) of 20% from base year 2010.

One of the key drivers is a 33% reduction in KWH at the Sewerage Authority since the installation of a 1.1 megawatt solar field in June 2011. Also contributing to the reduction is the installation of Solar Panels in September 2013 and Solar Tubes in 2012 at the Department of Public Works and Engineering Building. All municipal buildings have experienced reductions in electric usage due to the installation of efficient lighting & HVAC measures, contributing to the overall 25% reduction in CO₂e for electric. Fleet efficiencies have reduced CO₂e by 22% as the Township continues to replace low MPG vehicles with higher MPG units, downgrade vehicle size when appropriate and practice proactive vehicle maintenance to ensure efficiency.

The favorable results indicate the significant progress Bernards Township has made over the past few years in reducing Bernards Townships Carbon Footprint.

Municipality:

Bernards Township

complete applicable cells highlighted in yellow, grey cells contain formulas

STEP 1: Establish a Baseline Year

Baseline Year Selected: 2015

STEP 2: Scope 1 Emissions from Stationary Fuel Consumption in Baseline Year

Municipal Operation - Natural Gas	Total Therms	converted to Million BTU	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)	Emissions (Metric Tons)	CH4 (Metric Tons CO2e)	N2O Emissions (Metric Tons)	N2O (Metric Tons CO2e)	Total Emissions (Metric Tons CO2e)
Building & Facilities	61149	6114.9446	715937.7138	324.7441206	0.030574723	0.764368075	0.000611494	0.18222535	325.690714
Street Lights & Traffic Signals	0	0	0	0	0	0	0	0	0
Water & Wastewater Treatment Facilities	11305	1130.5263	132362.0192	60.03844567	0.005652632	0.141315788	0.000113053	0.03368968	60.21345114
Other		0	0	0	0	0	0	0	0
<i>Natural Gas Total</i>	<i>72454.709</i>	<i>7245.4709</i>	<i>848299.733</i>	<i>384.7825663</i>	<i>0.036227355</i>	<i>0.905683863</i>	<i>0.000724547</i>	<i>0.21591503</i>	<i>385.9041652</i>

Municipal Operation - Heating Oil	Total Gallons	converted to Million BTU	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)	Emissions (Metric Tons)	CH4 (Metric Tons CO2e)	N2O Emissions (Metric Tons)	N2O (Metric Tons CO2e)	Total Emissions (Metric Tons CO2e)
Building & Facilities	0	0	0	0	0	0	0	0	0
Street Lights & Traffic Signals	0	0	0	0	0	0	0	0	0
Water & Wastewater Treatment Facilities	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
<i>Heating Oil Total</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>

Municipal Operation - Other Fuel 1 <i>specify fuel (coal, diesel, etc)</i>	Total (specify unit)	convert to Million BTU	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)	Emissions (Metric Tons)	CH4 (Metric Tons CO2e)	N2O Emissions (Metric Tons)	N2O (Metric Tons CO2e)	Total Emissions (Metric Tons CO2e)
Building & Facilities	0			0		0		0	0
Street Lights & Traffic Signals	0			0		0		0	0
Water & Wastewater Treatment Facilities	0			0		0		0	0
Other	0			0		0		0	0
<i>Other Fuel 1 Total</i>	<i>0</i>			<i>0</i>		<i>0</i>		<i>0</i>	<i>0</i>

Municipal Operation - Other Fuel 2 <i>specify fuel (coal, diesel, etc)</i>	Total (specify unit)	convert to Million BTU	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)	Emissions (Metric Tons)	CH4 (Metric Tons CO2e)	N2O Emissions (Metric Tons)	N2O (Metric Tons CO2e)	Total Emissions (Metric Tons CO2e)
Building & Facilities	0			0		0		0	0
Street Lights & Traffic Signals	0			0		0		0	0
Water & Wastewater Treatment Facilities	0			0		0		0	0
Other	0			0		0		0	0
<i>Other Fuel 2 Total</i>	<i>0</i>			<i>0</i>		<i>0</i>		<i>0</i>	<i>0</i>

STEP 3: Scope 2 Emissions from Purchased or Acquired Electricity in Baseline Year

Municipal Operation - Electricity	Total Kwh	Total MWh	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)					Total Emissions (Metric Tons CO2e)
Building & Facilities	1,445,988	1,445.987671	1,897,135.824	860.5269606					860.5269606
Street Lights & Traffic Signals	339,342	339.342	445,216.704	201.9470469					201.9470469
Water & Wastewater Treatment Facilities	1,766,886	1,766.886000	2,318,154.432	1,051.4979278					1051.497928
Other	0	0	0	0					0
<i>Electricity Total</i>	<i>3,552,216</i>	<i>3,552.215671</i>	<i>4,660,506.960</i>	<i>2,113.97194</i>					<i>2113.971935</i>

* includes CO2, CH4 and N20 emissions preconverted to carbon dioxide equivalents (CO2e)

STEP 4: Scope 1 Emissions from Mobile Fuel Combustion in Baseline Year

Municipal Operation - Vehicle Emissions CO2 emissions by fuel usage	Total Gallons	CO2 Emissions (lbs fuel unit)	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)					
Motor Gasoline	44,984	19.54	878987.36	398.7022499					
Diesel Fuel	22,097	22.37	494309.89	224.2153576					
Compressed Natural Gas	-	120.36	0	0					
Small Equipment- Motor Gasoline	1,783	19.54	34839.82	15.80308802					
Small Equipment- Diesel	4,283	22.37	95810.71	43.45903864					
Other 3 (specify fuel)			0	0					

Municipal Operation - Vehicle Emissions CH4 and N20 emissions by mileage	Total Mileage	Emissions (Metric Tons)	CH4 (Metric Tons CO2e)	N20 Emissions (Metric Tons)	N20 (Metric Tons CO2e)	Total Emissions (Metric Tons CO2e)		
Totals from <i>Worksheet 3, "Vehicle CH4 & N20"</i>	691,767	0.009889044	0.247226093	0.005687968	1.69501446			
<i>Vehicle Fuel Total</i>		<i>1503947.78</i>	<i>682.1797342</i>	<i>0.009889044</i>	<i>0.247226093</i>	<i>0.005687968</i>	<i>1.69501446</i>	<i>684.1219747</i>

STEP 5: (Optional) Emissions from Waste Related Activities in Baseline Year

GHG Emissions from Baseline Waste Management (MtCO2e) calculated at		Total Emissions (Metric Tons CO2e)
<i>Waste Management Total</i>	http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_Form.html	

TOTALS

MUNICIPAL CARBON FOOTPRINT	3183.998075
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Municipality:

Bernards Township

complete applicable cells highlighted in yellow, grey cells contain formulas

STEP 1: Establish a Baseline Year

Baseline Year Selected:

2010

STEP 2: Scope 1 Emissions from Stationary Fuel Consumption in Baseline Year

Municipal Operation - Natural Gas	Total Therms	converted to Million BTU	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)	Emissions (Metric Tons)	CH4 (Metric Tons CO2e)	N2O Emissions (Metric Tons)	N2O (Metric Tons CO2e)	Total Emissions (Metric Tons CO2e)
Building & Facilities	44,004	4400.4	515198.832	233.690429	0.022002	0.55005	0.00044004	0.13113192	234.3716112
Street Lights & Traffic Signals		0	0	0	0	0	0	0	0
Water & Wastewater Treatment Facilities	8,608	860.8	100782.464	45.71419	0.004304	0.1076	0.00008608	0.02565184	45.8474418
Other		0	0	0	0	0	0	0	0
<i>Natural Gas Total</i>	<i>52,612</i>	<i>5261.2</i>	<i>615981.296</i>	<i>279.404619</i>	<i>0.026306</i>	<i>0.65765</i>	<i>0.00052612</i>	<i>0.15678376</i>	<i>280.219053</i>

Municipal Operation - Heating Oil	Total Gallons	converted to Million BTU	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)	Emissions (Metric Tons)	CH4 (Metric Tons CO2e)	N2O Emissions (Metric Tons)	N2O (Metric Tons CO2e)	Total Emissions (Metric Tons CO2e)
Building & Facilities		0	0	0	0	0	0	0	0
Street Lights & Traffic Signals		0	0	0	0	0	0	0	0
Water & Wastewater Treatment Facilities		0	0	0	0	0	0	0	0
Other		0	0	0	0	0	0	0	0
<i>Heating Oil Total</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>

Municipal Operation - Other Fuel 1 <i>specify fuel (coal, diesel, etc)</i>	Total (specify unit)	convert to Million BTU	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)	Emissions (Metric Tons)	CH4 (Metric Tons CO2e)	N2O Emissions (Metric Tons)	N2O (Metric Tons CO2e)	Total Emissions (Metric Tons CO2e)
Building & Facilities				0		0		0	0
Street Lights & Traffic Signals				0		0		0	0
Water & Wastewater Treatment Facilities				0		0		0	0
Other				0		0		0	0
<i>Other Fuel 1 Total</i>	<i>0</i>			<i>0</i>		<i>0</i>		<i>0</i>	<i>0</i>

Municipal Operation - Other Fuel 2 <i>specify fuel (coal, diesel, etc)</i>	Total (specify unit)	convert to Million BTU	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)	Emissions (Metric Tons)	CH4 (Metric Tons CO2e)	N2O Emissions (Metric Tons)	N2O (Metric Tons CO2e)	Total Emissions (Metric Tons CO2e)
Building & Facilities				0		0		0	0
Street Lights & Traffic Signals				0		0		0	0
Water & Wastewater Treatment Facilities				0		0		0	0
Other				0		0		0	0
<i>Other Fuel 2 Total</i>	<i>0</i>			<i>0</i>		<i>0</i>		<i>0</i>	<i>0</i>

STEP 3: Scope 2 Emissions from Purchased or Acquired Electricity in Baseline Year

Municipal Operation - Electricity	Total Kwh	Total MWh	CO2e Emissions (lbs) *	CO2e (Metric Tons)					Total Emissions (Metric Tons CO2e)
Building & Facilities	1,724,224	1724.224	2262181.888	1026.10919					1026.10919
Street Lights & Traffic Signals	347,150	347.15	455460.8	206.593694					206.593694
Water & Wastewater Treatment Facilities	2,654,581	2654.581	3482810.272	1579.77731					1579.777315
Other		0	0	0					0
<i>Electricity Total</i>	<i>4,725,955</i>	<i>4725.955</i>	<i>6200452.96</i>	<i>2812.4802</i>					<i>2812.480199</i>

* includes CO2, CH4 and N2O emissions preconverted to carbon dioxide equivalents (CO2e)

STEP 4: Scope 1 Emissions from Mobile Fuel Combustion in Baseline Year

Municipal Operation - Vehicle Emissions CO2 emissions by fuel usage	Total Fuel Units	CO2 Emissions (lbs/fuel unit)	CO2 Emissions (lbs)	CO2 (Metric Tons CO2e)					
Motor Gasoline (per gallon)	56,595	19.54	1105857.507	501.608892					
Diesel Fuel (per gallon)	29,564	22.37	661335.9424	299.977156					
Compressed Natural Gas (per 1000 cubic feet)		120.36	0	0					
Small Equipment-Motor Gasoline (per gallon)	2,051	19.54	40076.54	18.178426	other fuels see http://www.eia.doe.gov/oiaf/1605/excel/Fuel Emission Factors.xls				
Small Equipment-Diesel (per gallon)	4,946	22.37	110637.546	50.1843832					
Other 3 (specify fuel and units)			0	0					

Municipal Operation - Vehicle Emissions CH4 and N2O emissions by mileage	Total Mileage	Emissions (Metric Tons)	CH4 (Metric Tons CO2e)	N2O Emissions (Metric Tons)	N2O (Metric Tons CO2e)	Total Emissions (Metric Tons CO2e)		
Totals from <i>Worksheet 3, "Vehicle CH4 & N2O"</i>	767,503	0.010963643	0.274091069	0.007884789	2.34966721			
<i>Vehicle Fuel Total</i>		<i>1917907.535</i>	<i>869.948857</i>	<i>0.010963643</i>	<i>0.274091069</i>	<i>0.007884789</i>	<i>2.34966721</i>	<i>872.5726156</i>

STEP 5: (Optional) Emissions from Waste Related Activities in Baseline Year

	Total Emissions (Metric Tons CO2e)
GHG Emissions from Baseline Waste Management (MtCO2e) calculated at http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_Form.html	
<i>Waste Management Total</i>	

TOTALS

	Total Emissions (Metric Tons CO2e)
MUNICIPAL CARBON FOOTPRINT	3965.271868