Sullivan County Greenhouse Gas Emissions Benchmarking Report 2017

In 2017, the County continued to benchmark the 19 County owned or leased buildings that are larger than 1,000 square feet and use energy to heat or cool the occupied space. This information helps us measure our progress in improving energy efficiency, deploying renewable energy resources, reducing GHG emissions, and reducing energy costs in County facilities.

The 2017 report includes 12 months of data on the County's 2.5MW solar array at the Care Center at Sunset Lake (formerly the Adult Care Center) in Liberty. This energy is net metered to the Care Center and to other buildings owned by the County. In addition, the 2017 report includes 64,229kWh of electricity from smaller scale solar installations at the SC Transportation Facility in White Lake and the Human Services Complex in Liberty; energy from these arrays is used on-site.

Elevated source EUI was a trend at all County facilities in 2017. This reflects increased fuel use due to the increased number of Heating Degree Days (HDD) and increased number of Cooling Degree days. The colder the outdoor air temperature, the more energy it takes to heat a building; the warmer the outdoor air temperature, the more energy it takes to cool the building. The exception to this trend in elevated EUI was the Sullivan County Government Center, which improved its energy performance due to an energy retrofit that featured new heating and air conditioning systems (HVAC) including boilers, rooftop units and building management controls, as well as indoor and outdoor LED lighting.

Three County facilities, the SC Transportation Facility, the SC Courthouse, and SC Government Center, received Energy Star ratings. The EPA revised this metric in 2018, which resulted in lower ratings in comparison to comparable buildings nationwide. The Sullivan County Transportation Facility in White Lake achieved a score of 99 in 2016, but the revised calibration awards the Facility a score of 60. The Sullivan County Courthouse's 2016 score of 46 was revised downward to 13. As a result of installation of new heating and air conditioning systems (HVAC) and LED lighting at the Sullivan County Government Center, the facility would have raised its score from 40 in 2016 to 46 for 2017; however, in the revised system, the building's energy score remained at 40, compared to other comparable buildings nationwide. This may change in 2018, when the County will have a full 12 months of energy data since completion of the Government Center retrofit; 2017 data reflects only one quarter in which the retrofit was complete.

Energy Data Glossary

Btu: A British thermal unit (Btu) is a standard unit of energy, defined as the amount of heat needed to raise the temperature of one pound of water by one degree Fahrenheit. In tracking building energy use, the Btu provides a single unit of measure that allows us to analyze the efficiency of systems that use a variety of fuels.

Energy Star: ENERGY STAR is a U.S. Environmental Protection Agency voluntary program that helps businesses and individuals achieve superior energy efficiency. Energy Star building ratings are based upon 150 separate metrics such as each building's size, location, the number of occupants, number of computers, and other characteristics, 1 being the worst, 100 being the most efficient.

EUI: Energy Use Intensity (EUI) expresses a building's energy use as a function of its size and other characteristics. For most property types in Portfolio Manager, the EUI is expressed as energy per square foot per year. It is calculated by dividing the total energy consumed by the building in one year (measured in thousands of British thermal units or kBtu) by the total gross floor area of the building. In general, a low EUI signifies good energy performance. EUI can be calculated on site energy use or source energy use, as explained in the following glossary entries.

GHG (as measured in MTCO2e): There are a number of greenhouse gases (GHG), including carbon dioxide, methane, nitrous oxide and ozone. CO2 equivalent or CO2e, is a unit of measure that allows us to express the impact of each different GHG in terms of the amount of CO2 that would create the same amount of warming. CO2e allows us to express a carbon footprint consisting of different GHGs as a single, consistent number.

Heating and **Cooling Degree Days:** Degree days measure the amount of heating or cooling necessary at a given property. Degree days are measured relative to a base of 65°F. Above 65°F, it is assumed that the building will need to have cooling, and below 65°F it is assumed that the building will need to have heating. **Heating Degree Days (HDD)** are calculated based upon the number of days a building would have to

be heated by 1 degree to accommodate the heating requirement. For example, on a day on which the temperature is 55°F degrees, that day is worth 10 Heating Degree Days because it is 10 degrees below 65°F. HDD is calculated in this way for each day of the year and summed up to get the total annual HDD. **Cooling Degree Days (CDD)** are calculated based upon the number of days a building would have to be cooled by 1 degree to accommodate the cooling requirement. For example, on a day on which the temperature is 80°F degrees, that day is worth 15 Cooling Degree Days because it is 15 degrees above 65°F. CDD is calculated in this way for each day of the year and summed up to get the total annual CDD.

Site Energy Use: Site Energy Use is the annual amount of all the energy a property consumes onsite, as reported on utility bills.

Site EUI: The Site Energy total for one year, as reflected in the building's energy bills, divided by the total square footage of the building, yields a number that represents Site Energy Use Intensity (Site EUI). Site EUI helps building managers understand how the energy use for an individual building changes over time.

Source Energy Use: Source Energy Use represents the total amount of raw fuel that is required to operate the building. It incorporates all production, transmission, delivery, storage, and transport losses for all fuel types. Source Energy Use is the basis for ENERGY STAR's rating system, which converts the consumption of each type of energy into a single common unit (kBtu) and expresses it as a score of 1-100, so that the energy performance of diverse buildings can be compared equitably.

Source EUI: The source energy use total for one year, divided by the total square footage of the building, yields a Source Energy Use Intensity (Source EUI) that provides the most comprehensive measure of a building's energy performance. By taking all energy use into account, the score provides a complete assessment of energy efficiency in a building.

Sullivan County Benchmarking Data 2017

Property Name	Property GFA - Self-Reported (ft²)	Number of Buildings	Year Built	Electricity Use - Grid Purchase & Onsite Renewable Systems (kWh)	Electricity Use - Grid Purchase & Onsite Renewable Systems (kBtu)	Electricity Use – from Onsite Renewable Systems and Used Onsite (kWh)	Electricity Use – Generated from Onsite Renewable Systems and Used Onsite (kBtu)	Propane Use (kBtu)	Fuel Oil #2 Use (kBtu)	Site Energy Use (kBtu)	Source Energy Use (kBtu)	Site EUI (kBtu/ft²)	Source EUI (kBtu/ft²)	Total GHG Emissions (Metric Tons CO2e)	Direct GHG Emissions (Metric Tons CO2e)	Indirect GHG Emissions (Metric Tons CO2e)	National Median Total GHG Emissions (Metric	% Difference from National Median Site EUI	% Difference from National Median Source EUI
Sullivan County Government Center	113178	1	1975	1736928	5926398.3	0	0	0	4835754.6	10762152.8	21478027.2	95.1	189.8	592	358.9	233.2	530.6	11.6	11.6
Emergency Services Training Facility	10515	1	2010	52507	179153.9	0	0	239209.2	0	418363.1	743232.2	39.8	70.7	22.4	15.4	7	35	-35.9	-35.9
Transportation Facility	11387	1	2009	32507.9	110916.9	8380.7	28595	632849.6	0	743766.5	898274.4	65.3	78.9	43.9	40.7	3.2	47.2	-6.9	-6.9
Sullivan County Courthouse	32454	1	1090	465598.9	1588623.4	0	0	0	1090117.2	2678740.6	5549163.8	82.5	171	143.4	80.9	62.5	89.9	59.4	59.4
Human Services Complex (Liberty)	174025	10	1916	3804206.5	12979952.4	55848.5	190554.9	2429618.9	3497804.6	18907376	41987565.8	108.6	241.3	918.8	415.7	503.1	443.2	107.3	107.3
Barryville Maintenance Shops	26624	5	1930	173595.6	592308.2	0	0	140520.8	1196556.6	1929385.6	3008911.2	72.5	113	121.1	97.8	23.3	103.8	16.6	16.6
Callicoon Storm Station - RT. 97	6440	1	1955	24986	85252.2	0	0	0	159666	244918.2	399968.9	38	62.1	15.2	11.8	3.4	21.9	-30.4	-30.4
DPW Maplewood Facility	47663	2	1987	391507.4	1335823.2	0	0	1075700.7	944016.6	3355540.4	5780219.1	70.4	121.3	191.7	139.2	52.6	141.1	35.8	35.8
Livingston Manor Storm Station	2102	1	1960	52932.6	180606.2	0	0	0	79598.4	260204.6	586091.6	123.8	278.8	13	5.9	7.1	4.2	212.3	212.3
Sullivan County International Airport	64295	9	1970	599500.9	2045497.1	0	0	374868.1	780238.2	3200603.4	6894049.1	49.8	107.2	162.5	82	80.5	169.7	-4.3	-4.3
Landfill	71729	7	1984	312933	1067727.4	0	0	2224863.6	0	3292590.8	5236748.5	45.9	73	184.9	142.9	42	226.2	-18.2	-18.2
Rockland Transfer Station	1680	1	1985	30887	105386.4	0	0	0	0	105386.4	295082	62.7	175.6	4.1	0	4.1	2.1	96.7	96.7
Ferndale Transfer Station	7225	1	1987	28242.5	96363.4	0	0	0	0	96363.4	269817.4	13.3	37.3	3.8	0	3.8	9.1	-58.2	-58.2
Highland Transfer Station	3850	1	1990	44292.6	151126.4	0	0	0	0	151126.4	423153.9	39.3	109.9	5.9	0	5.9	4.8	23.1	23.1
Mamakating Transfer Station	5050	1	1991	38836.3	132509.5	0	0	0	0	132509.5	371026.6	26.2	73.5	5.2	0	5.2	6.3	-17.7	-17.7
D&H Linear Park Museum Interpretive	2560	1	2004	1704.8	5816.7	0	0	38262.8	0	44079.5	54932.2	17.2	21.5	2.7	2.5	0.2	14	-80.8	-80.8
Hurleyville Cultural Center	16200	1	1912	183410.7	625797.3	0	0	0	0	625797.4	1752232.6	38.6	108.2	24.6	0	24.6	25.5	-3.4	-3.4
Plaza Drive Building (leased)	20000	1	1980	31599.1	107816.1	0	0	692484	0	800300.2	1001294	40	50.1	48.7	44.5	4.2	86.9	-43.9	-43.9
1909 Jail	58998	1	1909	835750.6	2851581	0	0	0	4263482.4	7115063.4	12290544.1	120.6	208.3	428.6	316.4	112.2	321.7	33.2	33.2
				8841927.4	30168656	64229.2	219149.9	7848377.7	16847234.6	54864268.2	109020334.6	1149.6	2291.5	2932.5	1754.6	1178.1			