Raritan Valley COMMUNITY COLLEGE
Facilities & Grounds Department
P. O. Box 3300 ● Somerville, New Jersey 08876-1265
ph: 908-218-8879 ● fax: 908-526-0306

Greenhouse Gas Inventory 2019-20

Prepared by Susan Dorward, Sustainability & Energy Coordinator

December 17, 2020

1 Table of Contents

1 Introduction

Raritan Valley Community College continues to demonstrate its commitment to addressing the issue of climate change by becoming carbon neutral for Scope 1 (direct emissions from natural gas, oil, and gasoline) and Scope 2 (indirect emissions from purchased electricity) in fiscal year 2017. Scope 3, which includes emissions from student and employee commuting, is not included in this inventory. Carbon neutrality is defined as having no net emissions after minimizing the carbon footprint as much as possible and offsetting the remaining emissions. To our knowledge, RVCC is the first two-year institution of higher education in the US to reach carbon neutrality for Scopes 1 and 2. The College has remained carbon neutral for Scopes 1 and 2 for FY18, FY19, and FY20.

The College has increased its energy efficiency continually since 2005. In addition, the College purchases Green-e certified renewable energy credits (since 2014) and certified carbon offsets (since 2017) to achieve carbon neutrality. For FY20, the College purchased US renewable energy RECS and third party verified no-till agriculture offsets.

This report summarizes Raritan Valley Community College's greenhouse gas emissions for the 2019-20 fiscal year (July 1-June 30), which will be referred to simply as FY20. This profile is intended to be a calculation designed to help the College better evaluate the current impact of their operations and facilities on GHG, and to help measure GHG emission reductions compared to the 2004-5 FY baseline (reported in 2011). 2008, 2011, 2014, and 2017 data are also provided for comparison.

RVCC's emission inventory includes Scope 1, Scope 2, and select Scope 3 emissions of three major GHGs identified in the Kyoto Protocol, namely Carbon dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_2O). To calculate emissions, the College used the new SIMAP™ tool (see Section 2.2 for details). SIMAP™ does not quantify Hydrofluorocarbon (HFC), Hydrochlorofluorocarbons (HCFC), Sulfur hexafluoride (SF_6), or Perfluorocarbon (PFC) emissions. It does calculate CO_2-equivalent emissions from refrigerants, called fugitive emissions, in Scope 1 calculations. SIMAP™ also reports NO_x emissions but does not include these in Scope 1 calculations. Given the nature of RVCC's operations, emissions of HFCs, HCFCs, SF_6, PFCs, and NO_x are expected to be insignificant; the majority of emissions are expected to be in the form of CO_2, with much smaller portions of N_2O and CH_4.

Note that the campus was shut down starting in mid-March due to the coronavirus pandemic. The building management system settings were adjusted so that most of the campus was "unoccupied" for about two months, which likely contributed to reduced electricity and gas usage.

1.1 Campus Overview

Raritan Valley Community College, founded in 1969, is a 2-year public, community college located in North Branch, New Jersey. Located on a property of 242 acres, the College's campus consists of 17 buildings, 10 parking areas and wooded and riparian areas.

1.2 Environmental Agreements

In March 2009, Raritan Valley Community College considered joining the American College and University Presidents Climate Commitment (ACUPCC, the Commitment), a coalition of colleges and universities concerned about the impacts of global warming and dedicated to reducing their institutions' greenhouses gas (GHG) emissions. RVCC decided not to join the ACUPCC because of the pledge to achieve carbon neutrality, which we were not sure was possible.

ACUPCC signatories were to select two or more of seven specified tangible actions to reduce greenhouse gases. Raritan Valley Community College has implemented two such actions:

1. Establish a policy that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard or equivalent.

2. Adopt an energy-efficient appliance purchasing policy requiring purchase of ENERGY STAR certified products in all areas for which such ratings exist.

Rather than joining the ACUPCC, in 2009 Raritan Valley Community College pledged to reduce its environmental impact and raise environmental awareness by signing an agreement of environmental stewardship with the EPA. The agreement is in the form of a Memorandum of Understanding (MOU). RVCC is the first community college in the nation to sign an environmental stewardship agreement with the EPA.

Using EPA guidelines and voluntary programs, RVCC developed policies and programs that focus on protecting and bettering the environment, allowing RVCC to take a leadership role in this area. This agreement enabled RVCC to actively pursue and document green initiatives that benefit our faculty, staff, students and community. Although the EPA program was shut down in 2016, the College continues to follow the program's guidelines.

1.3 Other GHG Incentives

In February 2007, Governor Jon S. Corzine signed Executive Order No. 54 mandating that greenhouse gas (GHG) emissions in New Jersey be reduced by twenty (20) percent to the levels of 1990 by the year 2020. The mandate further required an eighty (80) percent reduction below 2006 emission levels by the year 2050. Governor-elect Phil Murphy has promised to raise the 2050 goal to 100% clean energy.

In 2010, Raritan Valley Community College became a charter member of the American Association of Sustainability in Higher Education's (AASHE) Sustainability Tracking and Reporting System (STARS) program. In qualifying Raritan Valley Community College for the Silver rating in this program, the College provided data and documentation in a broad range of sustainability-related areas. As part of this process, the college estimated emissions for academic year 2004-2005, and calculates greenhouse gas emission reductions based on this data. The College has been rated by STARS three times, most recently achieving a Silver rating in 2019. RVCC now ranks as the #1 community college in the US in the "Air and Climate" category. The College also earned a perfect score in the "Water" category. Overall, the STARS program ranks RVCC as the #6 community college in the country.

2 Inventory Methodology

2.1 Emission Scopes

Institutional sources of greenhouse gas emissions are conventionally divided into three different scopes. These distinctions identify operational boundaries for institutions to "scope" their sources of emissions and to provide accountability for prevention of "double counting" or conversely, "double credits". These three scopes, numbered in degrees of removal from institutional control, are as follows.

2.1.1 Scope 1 (Direct Emissions)

Scope 1 refers to all direct emissions from facility operations. As per established reporting protocols, this is a required reporting category and incorporates emissions from sources owned and controlled by facility. Raritan Valley Community College's Scope 1 or Direct Emissions come from the following sources:

1. Stationary combustion of fossil fuels
2. Vehicle emissions from campus owned fleet
3. Refrigerant releases
4. Other fuel combustion from maintenance operations (lawn mowers, etc.)

Note that fertilizer emissions count in Scope 1, but RVCC did not use any fertilizer in 2014.

2.1.2 Scope 2 (Indirect Emissions from Purchased Energy)

This scope includes all indirect emissions that result from the purchase of electricity, heat, or steam, but occur at sources owned or controlled by another company. Scope 2 is also a required reporting category in GHG reporting protocols. Raritan Valley Community College's indirect emissions from purchased energy result from the following:

1. Indirect emissions generated in the production of electricity consumed by the institution

2. Emissions offset by the purchase of Renewable Energy Certificates

2.1.3 Scope 3 (Other Indirect Emissions)

Scope 3 emissions are a consequence of the activities of an entity, occurring from sources not owned or controlled by the facility. These activities may include employee and student commuting, and emissions at landfills and wastewater treatment plants as a result of the solid waste and wastewater generated at the college. Scope 3 emissions for commuting, solid waste, wastewater, and office paper are included in this inventory.

2.2 Tool

In previous years, the campus GHG inventory was calculated using a standardized greenhouse gas calculator, Clean Air-Cool Planet's CarbonMAP online tool. University of New Hampshire took over management of this tool and in September 2017 replaced it with SIMAP™ (Sustainability Indicator Management and Analysis Platform), created by the University of New Hampshire and available at https://unhsimap.org/. Like its predecessor, SIMAP™ uses standard methodologies codified by the GHG Protocol Initiative. It allows for inputting institutional data for each of the Scope 1, 2, and 3 emission sources and automatically calculates carbon and nitrogen emissions.

3 Global Warming Potential

The global warming potential (GWP) represents the contribution to global warming by a greenhouse gas or a chemical over a given period of time as compared with the contribution of the same amount of carbon dioxide. All GWP values represent global warming potential over a 100-year time horizon.

Global warming potentials (GWPs) are used to compare the abilities of different greenhouse gases to trap heat in the atmosphere and are based on the radiative efficiency (heat-absorbing ability) of each gas relative to that of carbon dioxide (CO_2), as well as the decay rate of each gas (the amount removed from the atmosphere over a given number of years) relative to that of CO_2. The GWP provides a construct for converting emissions of various gases into a common measure, which allows climate analysts to aggregate the radiative impacts of various greenhouse gases into a uniform measure denominated in carbon or carbon dioxide equivalents.

To incorporate and evaluate non-CO_2, gases in the participant's total GHG emissions inventory, the absolute tonnages of the emissions of these GHGs are converted to CO_2 equivalents (E). To do this, the absolute tonnage of a given GHG is multiplied by the GHG's global warming potential (GWP). The table below lists the 100-year GWPs used to express emissions on a CO_2 -

equivalent basis. For FY20 calculations, we used the SIMAP's 2019 emissions factors version and IPCC's AR5 GWP values (select values shown below).

Global Warming Potential (GWP) for Greenhouse Gases

GAS	100-Year GWP
CO_2	1
CH_4	28
N_2O	265
HCFC-22	1,760
HFC-134a	1,430
CF_4 (PFC-14)	6,630
SF_6	23,500

4 Institutional Data

The SIMAP™ tool requires the input of institutional data to enable normalized calculations such as energy usage per gross square foot and emissions per student. It also helps put the GHG results into context across the years, as we work hard to decrease GHG emissions while the institution grows.

4.1 Population

While the student population declined since 2017, online enrollment increased in 2020 due to summer enrollment during the pandemic. Note that the data below is for the academic year (September-August) rather than the fiscal year. SIMAP™ has a different set of population metrics than the old tool, which itself had changing population metrics over time. For simplicity, we show only those metrics used in SIMAP™ since 2017.

	AY2020	AY2017
FTE Students	5,112	5,578
FTE Staff	300	335
FTE Faculty	235	241
FTE Distance Education	819	324
FT Staff	194	219
PT Staff	317	348
FT Faculty	123	127
PT Faculty	336	342

4.2 Physical Space

Data is in gross square feet. The only new space since 2017 is the Print Shop, which is approximately 2,500 square feet. This represents a space increase of just .4%.

Square feet	2020	2017	2014	2011	2008	2005
Total Space	583,000	580,500	510,000	486,000	486,000	441,000
Laboratory Space	20,300	20,300	12,500			
Dining Space	18,000	18,000	18,000			
Athletic Facilities	50,000	50,000	50,000			

5 Weather

The weather in FY20 was a little colder in the winter and a little warmer in the summer compared to 2017. Contrasting with this, the polar vortex over the winter of 2013-14 resulted in significant increases in energy usage that year. To compare years, the total number of heating degree days (HDD) and cooling degree days (CDD) are shown below. FY20 had the lowest total heating and cooling degree days (TDD) of the six years measured. (Data was sourced from Weather Data Depot using the NJSO weather station in Somerville.)

	2020	2017	2014	2011	2008	2005
HDD	3,699	3,490	4,886	4,246	4,121	4,347
CDD	1,772	2,005	1,523	1,764	1,519	1590
TDD	5,471	5,495	6,409	6,010	5,640	5,937
% more than 2020		0.44%	17.07%	8.41%	2.81%	8.26%

6 Total Emissions

The new SIMAP^{TM} online tool, recommended by the American College and University Presidents Climate Commitment, was used to calculate campus GHG emissions. Raw data from the input forms are used to automatically calculate emissions of each GHG. Included here are calculations for CO_2, CH_4, and N_2O.

For each emissions source (such as natural gas combustion), input data (such as MMBtu's of gas) and specific conversion factors are used to calculate GHG emissions for each applicable GHG, in kilograms (kg). Then CO_2 equivalents are calculated for each of these GHGs. These equivalents are then summed and converted to metric tons carbon dioxide equivalent (MTCDE). In this way, the equivalent amount of MTCDEs of CO_2 emissions is determined for each emissions source, reported as MTDCEs.

Total gross GHG Scope 1 and Scope 2 emissions for 2020 were 4814.76 metric tons of carbon dioxide equivalent greenhouse gases (MTCDE GHG). The College purchased 1,579 MTCDE in carbon offsets and 9.364 MWh in renewable energy credits (RECs) (3,237 MTCDE) to offset these emissions, resulting in the College's being carbon neutral in Scopes 1 and 2. The carbon

offsets are third party verified from a no-till agriculture project. The RECs are Green-e certified US wind.

6.1 Total Emissions by Scope

RVCC net Scope 1 and Scope 2 emissions, which takes REC and carbon offset purchases into account, is -1.4 MTCDE. This means that the College's emissions are carbon neutral (or slightly carbon negative, to be exact). RVCC's Scope 1 and 2 gross emissions decreased by 16.1% since 2017, despite a slight increase in building space. The pandemic shutdown in the spring and relatively favorable weather were factors in this decrease.

Select Scope 3 emissions are presented in section 7.3.

Year-to-year comparison of GHG MTCDE

MTCDE	2020	2017	2014	2011	2008	2005
Scope 1 (gross)	1,577.92	1,875.17	1,972.29	2,081.30	2,380.60	5,515
Carbon offsets	1,579.00	1,876.00				
Scope 1 (net)	-1.08	-0.83				
Scope 2 (gross)	3,056.99	3,649.03	4,035.16	4,252	4,916	4,927
RECs	3,057.00	3,650.00	903.67			
Scope 2 (net)	-0.01	-0.97	3,131.49	4,252	4,916	4,927
Scope 1 + 2 (gross)	4,634.91	5,524.20	6,007.45	6,333.30	7,296.60	10,442.00
Scope 1 + 2 (gross) % reduction in 2020		16.10%	22.85%	26.82%	36.48%	55.61%
Scope 1 + 2 (net)	-1.09	-1.8	5,103.78	6,333.30	7,296.60	10,442.00

6.2 Normalized Emissions

The amount of emissions per square foot and per FTE continues to decrease over time, despite the reduction in FTE. FTE data represents the total of student (5,112), staff (300), and faculty (235) "full time equivalents". FTE data is not provided for prior years because the population data collected has changed with the new carbon calculator tool.

	2020	2017	2014	2011	2008
Scope 1+2 (gross)	4,634.91	5,524.20	6,007.45	6,333.30	7,296.60
FTE students, staff, and faculty	5,647	6,154			
Building Space sq ft	583,000	580,500	510,000	486,000	486,000
MTCDE Emissions per FTE	0.82	0.90			
Emissions per 1000 sq ft building space	7.95	9.5	11.8	13	15

6.3 Gross Emissions by Greenhouse Gas

Compared to 2017, the College emitted less of all greenhouse gases except CH_4. The numbers below represent Scope 1 and Scope 2 only. (The SIMAP tool automatically calculates electricity grid transmission and distribution losses, which are Scope 3 and are not included below.)

	2020	2017
CH_4 (kg)	416	301
CH_4 (MTCDE)	11.65	7.52
CO_2 (kg)	4,612,986	5,500,230
CO_2 (MTCDE)	4,612.99	5,500.23
N_20 (kg)	38	54
N_20 (MTCDE)	10.07	16.11
GHG (MTCDE)	4,634.70	5,524.20

7 Gross Emissions by Source

The SIMAP-generated table below shows emissions by source for Scope 1 and Scope 2. All rows are Scope 1 except the last row is Scope 2.

Source	Quantity	Unit	CO2 (kg)	CO2 (MTCDE)	Biogenic (MTCDE)	CH4 (kg)	CH4 (MTCDE)	N2O (kg)	N2O (MTCDE)	GHG MTCDE
Direct Transportation Sources: University Fleet: Diesel Fleet	88	US gallon	896	0.90	0.00	0	0.00	0	0.00	0.90
Direct Transportation Sources: University Fleet: Gasoline Fleet	1,471	US gallon	12,633	12.63	0.00	1	0.02	0	0.12	12.77
On-Campus Stationary Sources: Distillate Oil (#1-4)	1,828	US gallon	18,574	18.57	0.00	3	0.07	0	0.04	18.69
On-Campus Stationary Sources: Natural Gas	29,048	MMBtu	1,540,146	1,540.15	0.00	153	4.29	3	0.81	1,545.25
Refrigerants & Chemicals: HFC-134a	0	kilogram	0	0.00	0.00	0	0.00	0	0.00	0.31
Electricity, Steam, and Chilled Water: Electricity	9,363,127	kWh	3,040,736	3,040.74	0.00	259	7.25	34	9.00	3,056.99

7.1 Scope 1 Emissions (Stationary Sources)

MTCDE	2020	2017	2014	2011	2008	2005
Stationary Combustion	1,563.94	1,846.26	1,914	2,044	2,313	5,482
Mobile combustion	13.67	28.57	41	32	29	33
Fugitive emissions (refrigerants)	0.31	0.34	16.6	5.3	38.6	unknown
Total Scope 1	1,577.92	1,875.17	1,972	2,081	2,381	5,515

% reduction in 2020	15.85%	19.98%	24.17%	33.73%	71.39%

Stationary sources of emissions located on campus include fuel-burning equipment such as the co-generation engine, boilers, water heaters, emergency generators, and vehicle fleet. With the exception of the fleet and three diesel emergency generators, all of the equipment combusts natural gas. The facility keeps records of total monthly natural gas usage, which is inclusive of natural gas used by all the equipment located in the buildings. Refrigerants are also included in this category.

7.1.1 Cogeneration

Cogeneration is a form of stationary combustion. RVCC operates a cogeneration plant, which opened in 2008. For steam output, MVARh was treated as MWh and then converted to MMBTU. In 2020, the cogeneration plant did not run. Note that while this reduced total natural gas consumption (adding therms from sections 7.1.1 and 7.1.2), the result is that more electricity was consumed from the grid.

	2020	2017	2014	2011	2008
Electric Output (kWh)	0	636,000	702,000	2,944,500	2,160,000
Steam Output (MMBTU)	0	457	2513.5		
Natural Gas Usage (Therm)	0	57,717	56,587	141,840	112,840

7.1.2 Other On-Campus Stationary

The decline in natural gas consumption since 2005 is due to the cogeneration plant. Solar panels with a 446kW capacity went live in November 2011. Note that RVCC does not own the SRECs (solar renewable energy credits) for the solar array. Generating the electricity on campus reduces distribution loss. Solar numbers were obtained from billing, as the online Noveda interface produced inconsistent numbers. Solar numbers vary with weather and temperature.

	2020	2017	2014	2011	2008	2005
#2 heating oil (gal)	1,827.50	2,434	12,524	5,498	4,977	5,381
Natural gas (Therm)	290,484	284,710	278,993	233,930	314,720	1,025,650

Solar electricity generated on campus (kWh)	513,261	421,285	488,575

7.1.3 Fleet

Fuel consumption for the fleet and diesel emergency generators was calculated based on amount of fuel ordered during the year. Reduced fuel consumption is due to the pandemic shutdown in the spring.

	2020	2017	2014	2011	2008	2005
Diesel (gal)	88.2	683	1,113	536		479
Gas (gal)	1,471.3	2,363.53	3,317.6	2,998	3,200	3,200
Total MTCDE	13.67	28.57	41	32	29	33

7.1.4 Refrigerants

A small amount of replacement refrigerants were used. Vending machine refrigerant is based on an average from the vendor and the number of refrigerated vending machines. No refrigerant data was collected for 2005.

lbs	2020	2017	2014	2011	2008
R410A	0	0	5	0	0
HCFC-22 (R-22)	0	31	15	7	50
HFC-134a (vending machines)	.53	.53	.5	.5	

7.2 Scope 2 Emissions (Indirect Emissions from Purchased Energy)

Scope 2 includes emissions from the College's electricity consumption, purchased from commercial power companies (e.g., JCP&L). The College did not purchase any steam or chilled water. Since RVCC does not own the SRECs for its solar array, the electricity used from the array is included in the purchased electricity amount, in accordance with EPA standards.

GHG emissions from the generation of electricity consumed by the College in its owned or controlled equipment and operations are reported as indirect emissions. Consumed electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the entity. Scope 2 emissions physically occur at the facility where electricity is generated, and are a special category of indirect emissions.

Raritan Valley Community College uses electricity predominantly for lighting and ventilation purposes at most of the facilities and operations. Some limited heating equipment also operates on electricity.

Beginning in October 2012, RVCC started purchasing 10% renewable energy credits (RECs) in the form of Green-E certified US wind energy. In December 2013, RVCC increased this to 35%. In December 2014, RVCC increased this to 100%. Note that in the SIMAP^{TM} tool, offsets are in the "Sinks" category. They are included in Net emissions numbers below as they are intended to offset purchased electricity.

Note that the MTCDE per kWh has decreased over the years as the fuel mix for electricity generation has shifted to more natural gas and renewables. This results in lower MTCDE, even though we purchased more electricity.

Scope 2 Emissions (market-based)

	2020	2017	2014	2011	2008	2005
Purchased Electricity (kWh)	9,363,127	9,325,677	9,307,901	8,211,350	9,493,200	9,420,638
Purchased RECs (kWh)	9,364,000	9,326,000	2,084,500	0	0	0
Gross MTCDE	3,056.99	3649.03	4,035	4,252	4,916	4,927
Net MTCDE	-0.29	-0.13	3,131	4,252	4,916	4,927
% gross reduction in 2017		16.22%	24.24%	28.10%	37.82%	37.95%

7.3 Scope 3 Emissions (Other Indirect Emissions)

MTCDE	2020	2017	2014	2011	2008	2005
Commuting	3,864.7	8,101.65	11,033.78	*6,720*	*6,157*	*5,058*
Solid Waste	44.34	-6.63	-6.99	268		
Wastewater	2.87	4.16	4.26	25.0	19.9	14.4
Office Paper	86.33	262.25	66.17	60.9		
Total	**3,998.24**	**8,361.43**	11,098.22	*7494.8*	*6663.0*	*5557.8*

Totals for 2011 and prior were taken from the 2011 GHG report. Italics indicates that that the numbers are not directly comparable.

7.3.1 Commuting

Transportation mode percentages are from the December 2013 transportation survey. Miles per trip is taken from "A Geographical Analysis of Transportation Demand" by Jay Kelly and Tanya Rohrbach, 2012.

Commuting weeks per year were reduced by 12 due to the pandemic shutdown, which started in late March. (This allows for minimal commuting to campus during shutdown.)

While the historical data is not directly comparable, it is provided here for completeness. Prior to 2014, the method to calculate GHG emissions assumed that students and faculty make five (5) roundtrips per week for thirty (30) weeks per year, and that each roundtrip is approximately 18 miles for all travelers. In addition, it was assumed that two (2) part-time students equal one (1) full-time student, and three (3) adjuncts equal one (1) full-time faculty. Staff and summer travel were not included. According to the 2010 survey, 10% of students and 3% of employees carpooled and 1% of students take the bus. As shown in the following subsections, these numbers increased in the 2013 survey. In addition the GHG calculation varied depending on the tool used.

MTCDE	2020	2017	2014	2011	2008	2005
Student	3,159.95	4,461.63				
Faculty	191.1	447.01				
Staff	513.65	764.78				
Total	3,864.7	5,673.42	*11,033.78*	*6,720*	*6,157*	*5,058*

FTE	2020	2017
On-campus Student	4,293	5,254
Faculty	235	241
Staff	300	335

7.3.1.1 Student Commuting

RVCC does not have on-campus housing. Therefore, all students commute to campus. We used student FTE numbers, subtracting out the FTE for online learning. Commuting weeks is one less than faculty commuting weeks.

Students: FTE students – FTE online = 5112 – 829 = 4293
Trips per week: 10
Commuting weeks per year: 38 – 12 = 26

Mode	% of trips	Miles per trip	Total miles	MTCDE
Walk	1	1	11,162	0
Carpool	15	8.6	1,439,872	259.51

Rail	0	8.6	0	0
Bus	2	8.6	191,983	63.1
Personal car	82	8.6	7,871,301	2,837.34
Total				3,159.95

7.3.1.2 Faculty Commuting

FTE Faculty: 235

Trips per week: 10

Commuting weeks per year: 39 (30 for spring and fall semesters, 9 for summer) – 12 = 27

Mode	% of trips	Miles per trip	Total miles	MTDCE
Walk	3	1	0	0
Carpool	9	14.5	82,802	14.92
Rail	2	14.5	2,783	2.79
Bus	4	14.5	12,085	12.10
Personal car	82	14.5	447,449	161.29
Total				191.1

7.3.1.3 Staff Commuting

Travel mode data is the same as in the faculty table above (staff and faculty were not differentiated in the 2013 survey).

FTE Staff: 300

Trips per week: 10

Commuting weeks year: 48 – 12 = 36

Mode	% of trips	Miles per trip	Total miles	MTDCE
Walk	3	1	0	0
Carpool	9	14.5	140,940	25.40
Rail	2	14.5	31,320	4.75
Bus	4	14.5	62,640	20.61
Personal car	82	14.5	1,284,120	462.88
Total				513.65

7.3.2 Solid Waste

The SIMAP calculation appears to be different from the CarbonMAP one used earlier. The compost data is collected but not used in any calculations.

Short tons	2020	2017	2014	2011

Landfill	282.79	221	233	227
Composted	0	9.35	4	
MTCDE (landfill)	44.34	-7.51	-6.99	268

7.3.2.1 Landfilled Waste

In 2020, RVCC's waste hauler took **282.79 short tons** of our waste to the Hunterdon County Transfer Station. The waste then goes to the Grows/Tullytown landfills in PA. These landfills collect methane and send it to a power plant to be converted to energy. SIMAP appears to have changed their emissions calculations for this and no longer count it as negative emissions. Prior to 2014, waste was taken to a landfill without methane recovery. Note that waste hauler tonnage assumes that all dumpsters are full when tipped.

7.3.2.2 Composted Waste

RVCC did not compost any organics in 2020. A composter was installed in the spring but has not been used yet due to the pandemic shutdown.

7.3.3 Wastewater

Sewer service is billed based on water usage. RVCC has fixed major leaks in its water system, resulting in significant decreases in water usage and estimated wastewater since 2014. Wastewater is processed by Raritan Valley Sewerage Authority, which aerobically digests, de-waters, and incinerates the waste. Decreased water usage is due in part to the pandemic shutdown in the spring.

	2020	2017	2014	2011	2008	2005
Volume (million gallons)	6.65	9.14	8.78	48.4	38.2	27.7
MTCDE	2.87	4.44	4.26	25	19.9	14.4
% emissions reduction in 2020		35.36%	32.63%	88.52%	85.58%	80.07%

7.3.4 Office Paper

Purchasing buys 30% post-consumer recycled office paper. A bulk order was placed in December 2019 to avoid a price increase. It appears that the emissions calculation for paper changed over time. Copy Center paper has no recycled content and was not included in earlier inventories. Emissions from paper were not included in the 2005 and 2008 inventories.

	2020	2017	2014	2011
0% recycled paper (reams)	1,780			

30% recycled paper (reams)	10,860	9,600	9,600	10,400
Total MTCDE	86.33	56.98	66.17	60.9