



Greenhouse Gas Inventory Management Plan

CY 2019 Inventory

Report Version 1.1

July 2020

Prepared for:

American Public Education, Inc.

Table of Contents

	<u>Page</u>
1. General Information	1
1.1 Scope of Reporting Boundaries	1
1.2 Base Year	2
2. Scope 1: Direct Emissions	3
2.1 Stationary Combustion	3
2.2 Mobile Combustion	4
2.3 Fugitive Emissions	5
2.4 Electricity Emissions: Location-based Environmental Aspects	7
2.5 Electricity Emissions: Market-based	7
3. Scope 3: Upstream Indirect Emissions	8
3.1 Employee Commuting	8
3.2 Business Travel	9
3.3 Waste Disposal	11
4. Quality Control Procedures	13
5. Conclusion	14

1. General Information

Sundowner Sustainability Consulting, LLC (Sundowner) was contracted by American Public Education, Inc. (APEI) to compile their greenhouse gas (GHG) inventory for the calendar year (CY) 2019, spanning January 1 to December 31, 2019. This inventory has been prepared in accordance with the World Resources Institute Greenhouse Gas Protocol Corporate Accounting and Reporting Standard¹ (WRI Protocol), The Scope 2 Guidance and the Scope 3 Accounting and Reporting Standard. The WRI Protocol is built on five generally accepted financial accounting and reporting principles: Relevance, Completeness, Consistency, Transparency, and Accuracy.

Consistent with the CY 2018 inventory, 100-year Global Warming Potentials (GWP's) from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) are used in the calculation of the CY 2019 inventory. All seven Kyoto GHG's are reported (CO₂, CH₄, N₂O, HFC's, PFC's, SF₆ and NF₃), though APEI does not generate PFC's, SF₆ or NF₃.

Data was provided by the Facilities, Human Resources, and Finance departments, and where actual information was not available, through surveys and estimates.

This document summarizes the data sources and methods used to prepare APEI's GHG inventory. Refer to Appendix C for all data inputs, calculations, and emissions totals. The compilation of APEI's complete CY18 greenhouse gas inventory provided a benchmark against which measurable action for reductions can be taken, and CY19 emissions are compared against CY18 throughout this report.

1.1 Reporting Boundaries

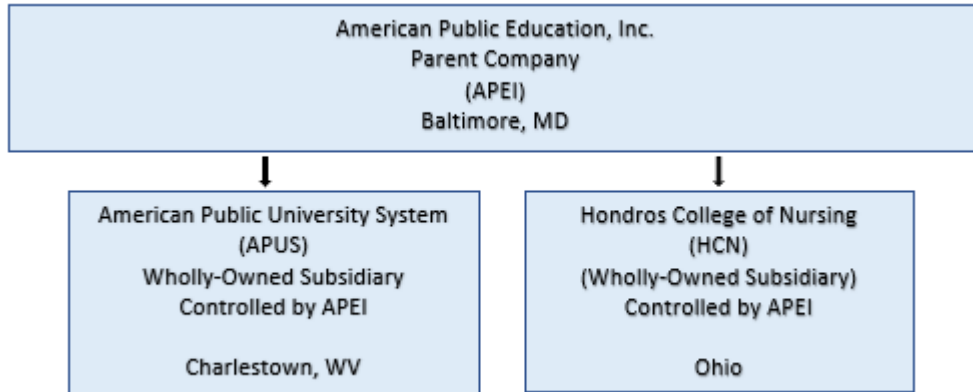
The CY2019 inventory has been prepared according to the Operational Control reporting methodology. All Kyoto greenhouse gases are included in the reporting scope (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆ and NF₃) though APEI does not emit PFC's, SF₆ or NF₃. Scope 1 and Scope 2 emissions are reported, along with emissions from the following upstream Scope 3 categories: Employee Commuting, Business Travel, and Waste Generated in Operations. All operations take place within the United States, primarily at the American Public University System (APUS) in Charles Town, WV, with two executive office facilities, one in Manassas, VA and one American Public Education Inc, (APEI) office in Baltimore, MD.

APEI also owns and operates the Hondros College of Nursing, which consists of 5 campuses in Ohio (Columbus, Cincinnati, Cleveland, Dayton, and Toledo), and one in Indianapolis, Indiana. The Indianapolis campus was not staffed until the beginning of 2020, and therefore was not included in the CY 2019 inventory but will be included in the CY 2020 inventory. Activity data for these facilities was largely unavailable at the time the inventory was calculated and therefore emission values were calculated based on square footage or employee counts when applicable. Actual square footage data was provided in CY 2019 providing more granularity to individual facility estimates.

¹ <https://ghgprotocol.org/corporate-standard>



APEI’s operational structure is as follows:



1.2 Base Year

The CY 2018 inventory serves as the base year as it is the first year where a complete inventory has been compiled.² A base year is required by the WRI protocol to allow for consistent, meaningful comparisons of “like for like”, over time.

There are certain situations which require a base year recalculation. These situations include the following:

- Structural changes in the organization, (e.g., the transfer of ownership of emissions generating activities to another organization). This includes mergers, acquisitions, divestitures, and outsourcing or insourcing of emitting activities.
- Changes in calculation methodology or improvement in accuracy of emission factors or activity data.
- Discovery of significant errors, or a number of errors that cumulatively have a significant impact.

The base year will be recalculated if any of the above situations, either individually or combined, result in a difference of more than 5% of total emissions. Organic growth or decline will not trigger baseline recalculation.

The release of revised EPA emission factors for electricity and business travel had a significant impact on reported emissions. In addition, an error identified in reported waste emissions was corrected. The base year was recalculated, and revised calculations can be found in Appendix D.

Metric Tons CO2e	CY 2018 Base Year	CY 2019	Change
Scope 1 Emissions	99.80	136.71	37%
Scope 2 Emissions - Location-based	4,169.36	3,234.69	-22%
Scope 2 Emissions - Market-based	3,946.64	2,299.87	-42%
Scope 3 Emissions - Employee Commuting	1,867.48	1,445.08	-23%
Scope 3 Emissions - Business Travel	408.16	313.63	-23%
Scope 3 Emissions - Waste Disposal	58.03	61.11	5%

² The CY14 inventory was completed in 2015 for reporting to Second Nature but this inventory did not include emissions from stationary combustion or market-based electricity.



2. Direct Emissions: Scope 1

Scope 1 emissions are emissions that occur as a direct result of the reporter's operations. For APEI, this includes combustion of petroleum-based fuels, and fugitive emissions from refrigeration. Emissions were calculated using emission factors obtained from the United States EPA Center for Corporate Climate Leadership³ Emission Factor Hub. EPA emission factors were updated in March 2020. Of Scope 1 emissions, only CH₄ and N₂O from vehicles are affected. These emissions sources are miniscule and therefore do not impact the comparison between CY18 and CY19.

2.1 Stationary Combustion

Building Heating

Propane is used for building heating at 203 South George Street, and fuels a fireplace at 111 West Congress Street. All other buildings at the Charlestown, WV location are heated by electric heat pump, as is APEI's Baltimore Facility. APUS's Manassas office facility is heated using natural gas.

Combustion data was provided for Manassas, VA in CY19, and actual emissions were calculated. Natural gas data was estimated in 2018 using the EIA Commercial Building Energy Consumption Survey (CBECS)⁴, 2012 release⁵. CBECS provides energy intensity data for facilities based on geographical location and principle building activity. Building heating is assumed to come from natural gas combustion when using CBECS data. Emissions were calculated from estimated energy use according to the energy intensity value for offices in the Southern United States census region⁶. CBECS data has been known to be conservative. Actual data from invoices was lower than previous year estimates, reducing reported Scope 1 emissions.

Building heating is electric for the five HCN campuses and Baltimore office, so stationary combustion does not occur at these facilities. Electricity consumption data was not available for these locations so energy use was estimated for each facility using square footage and CBECS intensity factors for heating. Intensity factors for education space in the mid-west census region were applied. Building heating estimates were calculated from natural gas values in scf/square foot, and then converted to kWh. This value was then combined with electricity estimates reported under Scope 2.

Emergency Generators

APUS has four diesel-powered emergency generators, three of which are permitted and tested regularly as part of their permit requirements. The permitted generators are tested weekly for 30 minutes at a time as to confirm proper functionality.

³ <https://www.epa.gov/climateleadership/center-corporate-climate-leadership-ghg-emission-factors-hub>

⁴ <https://www.eia.gov/consumption/commercial/data/2012/>

⁵ CBECS 2018 values not yet available at the time this inventory was prepared.

⁶ <https://www.eia.gov/consumption/commercial/maps.php>

The following table lists generator locations and models.

Location	Make and Model	Serial Number
303 West Third Avenue	Mitsubishi, S12H-Y2PTAW-1	900REOZMD
393 North Lawrence Street	John Deere, 6135HF485S	400REOZJ
330 North George Street	John Deere, 6068HFG85	200REOZJF

Each facility with a generator has a fuel tank which is filled approximately once per year. Emissions were calculated from fuel use provided from invoices. The time period between fill-ups was December 6, 2017 to October 17, 2019. In order to estimate a usage value for 2019, gallons were divided by number of days between tank fills to obtain a gallons/day value, and then multiplied by 365 to cover a year's time span. The same fuel volumes were used to estimate emissions in CY2019 as were used in CY2018. Because diesel consumption is a minimal portion of the inventory, any inaccuracy resulting from the estimation process would not have a material impact on the inventory. There is also a small (50 kW) generator located at 111 W. Congress Street which is not tracked for air quality purposes. Upper bound estimates for emissions from this generator result in only a few hundred kg of emissions. The Hondros College of Nursing does not operate any emergency generators for the buildings they occupy as they are leasing space in a multi-tenant building, and the Manassas and Baltimore offices do not have emergency generators.

2.2 Mobile Combustion

APUS has five vehicles that travel primarily between the two campuses, within a four-block radius. Estimated miles per gallon for city driving were obtained from the United States Department of Energy⁷ for each vehicle model and used to estimate fuel consumption.

Year	Make and Model	Fuel Type	MPG
2015	Nissan NV200	Gasoline	24
2015	Ford F150	Gasoline	17
2015	Nissan Quest	Gasoline	20
2011	Chevrolet Silverado (Hybrid)	Gasoline	20
2010	2010 Ford Econoline 250	Gasoline	13 ⁸

CO₂ emissions were calculated from fuel consumption based on the facilities manager's estimate that all vehicles combined traveled approximately 1,000 miles in 2019. Miles traveled were divided equally among the vehicles and used to calculate emissions from CH₄ and N₂O based on vehicle type (gasoline light-duty trucks). Emissions from vehicles make up less than 1% of total emissions (Scope 1 and 2 combined). HCN does not keep any company vehicles. Total emissions from vehicles were reduced slightly due to a change in EPA values for CH₄ and N₂O, but the difference was negligible (0.006 tons)

⁷ <https://fuelconomy.gov/>

⁸ MPG data was not available for the 2010 Ford Econoline 250 so 2005 data was used (the most recent model year available).

2.3 Fugitive Emissions

APEI has a licensed HVAC technician on staff to handle all equipment charging and refrigerant recovery. The Simplified Mass Balance Calculation Method was used to calculate fugitive emissions from buildings. The two satellite office locations are not serviced by the staff technician. Refrigerant use for these sites was estimated based on square footage, using an emission factor calculated from The World Bank Group GHG Emissions Inventory Management Plan, HVAC industry data and emission factors from EPA Climate Leaders. Refrigerant use at Hondros College of Nursing was estimated based on square footage and the same emission factor as the APUS/APEI Satellite office locations. The refrigerant was assumed to be R-410a.

Refrigerant in APEI's vehicle air conditioning systems are not tracked, and therefore emissions were estimated using the Screening Method published by The Climate Registry (TCR) in their General Reporting Protocol. Upper bound estimates for leakage rates are taken from TCR's default emission factors, released May 2019.

Emissions from refrigerants currently make up the majority of Scope 1 emissions. Tracking this source, as is done at the Charles Town Campus, provides the most accurate data, which is important for setting reduction targets. Estimates for refrigerant use based on square footage are generally very conservative, and any HVAC improvements would not be recognized using estimations. APEI/APUS would benefit from managing and tracking refrigerant at their Manassas and Baltimore offices and at HCN.

Fugitive emissions increased significantly in CY19 when the refrigerant was charged at the IT facility. IT centers generally require more air conditioning for servers and other computer equipment than standard office facilities so it is expected that this facility use a larger quantity of refrigerant than other facilities, however, the need to recharge a system implies leakage. APEI might consider investigating any leakage occurring in that system, as refrigerants have a particularly large impact on climate change.

3. Indirect Emissions: Scope 2

Indirect emissions constitute emissions that are a consequence of the activities of the company but occur at sources owned or controlled by another company. Indirect, or Scope 2 emissions include purchased electricity, purchased steam, and purchased heating and cooling (i.e. district heating and district cooling). APEI does not purchase steam, heating or cooling.

APEI made some significant reductions in consumption in CY 2019. A like for like comparison of kWh usage at the ten main APUS facilities was performed, as shown in the table below

Table 1: Year to Year Change in Electricity Consumption*

Facility	Address	Square Footage	CY 2018 kWh Consumption	CY2019 kWh Consumption	% Change
Finance Center	393 N. Lawrence Street	105,000	1,176,968	1,239,261	5%
Academics	330 North George Street	45,000	464,304	429,504	-7%
IT Center	303 West Third Avenue	38,200	1,120,268	1,042,672	-7%
Etter Hall (HR)	111 West Congress Street	10,432	177,040	160,160	-10%
Security Office	216 South George Street	5,400	99,075	109,033	10%
Overnight Guest Quarters	208 South George Street	4,844	35,138	39,212	12%
Leased to CDU	300 South George Street	4,400	48,840	n/a	n/a
Classroom Support	115 West Congress Street	3,500	n/a	160,160	n/a
Overnight Guest Quarters	200 South George Street	3,100	35,358	36,370	3%
Conference Rooms and Guest Quarters	203 South George Street	3,000	18,495	17,052	-8%
Facilities Department	219 South Charles Street	1,600	46,169	45,159	-2%

*All kWh values provided by Potomac Edison

APEI currently has two solar arrays installed and has received approval to install a third array on the IT Building.

Solar Array Location	Address	System Size
Finance Building	393 North Lawrence Street	375 kW
Academics Building	330 N. George Street	22 kW
IT Center	303 West Third Avenue	TBD

Currently APEI is selling RECs through SREC for all solar power generated (1 REC equals 1 MWh of electricity). In 2019, 415 RECs were sold, and that value (415 MWh) was used for total 2019 solar generation.

3.1 Electricity Emissions: Location-based

Location based emissions are calculated from kWh usage according to utility bills, and emission factors from the most current eGRID⁹ release available. Location-based emissions in the CY2018 inventory were calculated using eGRID2016 release. A new eGRID2018 dataset was released in March of 2020 and those factors have been applied to the CY 2019 inventory and the recalculated CY2018 base year inventory.

Solar power generated and consumed on-site is usually not included in the location-based value as this power has not been retrieved from the grid, however, APEI is selling RECS for the power generated, and therefore must report the power from the RECs sold as if it is grid electricity consumed. In 2019, this amounted to 415 RECs, or about 220 metric tons of CO₂e, (less emissions than CY18 despite a higher number of RECs sold, due to a reduction in the carbon intensity of grid electricity in this region).

Emissions were calculated from monthly electricity consumption data provided by Potomac Edison, and the carbon intensity factor for the appropriate eGRID subregion was applied.

3.2 Electricity Emissions: Market-based

Market based emission are calculated according to WRI's emission factor hierarchy. APEI does not purchase renewable power through Energy Attribute certificates (RECs) or other contractual instruments. Electric utilities/suppliers servicing APEI's properties do not all currently publish a verified CO₂ metric of their power mix.

Therefore a residual mix¹⁰ emission factor (Green-E)¹¹ was used in accordance with the market-based emission factor hierarchy described in WRI's Scope 2 Guidance¹². Green-E emission factors were also updated and differ from the original 2018 inventory.

Updated eGRID and Green-E factors have been applied to the base year recalculations in Appendix D

⁹ <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>

¹⁰ <https://www.green-e.org/docs/energy/Residual%20Mix%202018.pdf>

¹¹ Note that not all reporting programs allow the use of Green-E factors (e.g., The Climate Registry) as an acceptable residual mix emission factor. Use of Green-E is acceptable for reporting to the Carbon Disclosure Project.

¹² <https://www.wri.org/publication/ghg-protocol-scope-2-guidance>

4. Scope 3: Upstream Indirect Emissions: Scope 3

For the 2018 calendar year, Scope 3 emissions were calculated for employee commuting, business travel and waste. These sources were chosen based on availability of data. Additional sources may be added in the future. Scope 3 emissions are calculated according to the appropriate chapter of the WRI Protocol *Technical Guidance for Calculating Scope 3 Emissions*.

4.1 Employee Commuting

Emissions were calculated using the distance method outlined by the WRI Protocol Technical Guidance, Chapter 7 and emission factors from EPA. Emissions reported for APUS are calculated based on distance, according to vehicle type. Transportation method and distance to and from work were obtained and the appropriate emission factor was applied for each category. This data was then used to calculate an average CO₂e value per person for the year. For the CY2019 inventory, this average per person value was applied to updated employee counts provided for each location.

An employee commuter survey was conducted in CY18 for all APUS employees, in order to obtain information regarding transportation habits for traveling to and from work.

Transportation Method	Number of Commuters
Passenger Car	550
Light-Duty Truck	16
Carpool*	42
Subtotal: Employees at Charles Town	608
Remote Workers	255
Total Survey Responses	863

*Carpooler assumed to be passengers in a commuter vehicle

The employee survey was successful at obtaining the data necessary for calculating emissions and as a result it was assumed that full commuting data was captured in CY18.

In 2019, revised employee counts were provided for each facility. The average value calculated from the CY18 survey was applied to the total number of commuters at each location. Emission totals decreased significantly, primarily due to the reduced number of employees reported for Charlestown and Manassas (558 in 2019 vs 608 in 2018) and partly due to revised lower emission factors from EPA. APEI might consider issuing a similar survey for the School of Nursing employees when the next employee commuting survey is completed to represent HCN employee commuting more accurately.

4.2 Business Travel

Data on employee business travel was provided by the APEI’s travel agency, Direct Travel for air and rail data, and from APEI’s internal accounting department for vehicle miles traveled and rental car information.

Air Travel

Air travel is generally the largest contributor to emissions from business travel, and it makes up the majority of emissions from business travel. Total air mileage traveled in CY 19 was reduced significantly, which brought down business travel emissions. EPA emission factors for air travel were updated in the new release, and therefore a mileage comparison was performed between CY 2018 and CY 2019.

Airline Trip Length	CY 2018 Miles Traveled	CY 2019 Miles Traveled
Short Haul (< 300 miles)	915	1,099
Medium Haul (>= 300 miles, < 2300 miles)	628,899	507,387
Long Haul (>= 2300 miles)	1,139,908	748,070
Total Miles Traveled	1,769,722	1,256,556

APEI has made considerable progress in reducing air travel.

Rail Travel

Rail travel was identified based on station name and carrier ID (2V). Stations were identified in the “segment_itinerary” column. This information was used to estimate mileage traveled. Mileage values were obtained from Google Maps. Actual mileage is not provided for directions by rail, so car directions were used to obtain distance between stations, and the route was adjusted to most closely follow the Amtrak rail line. The following stations were included in the 2019 data set. Two stations were added that did not appear in the 2018 dataset (PAO and PVD).

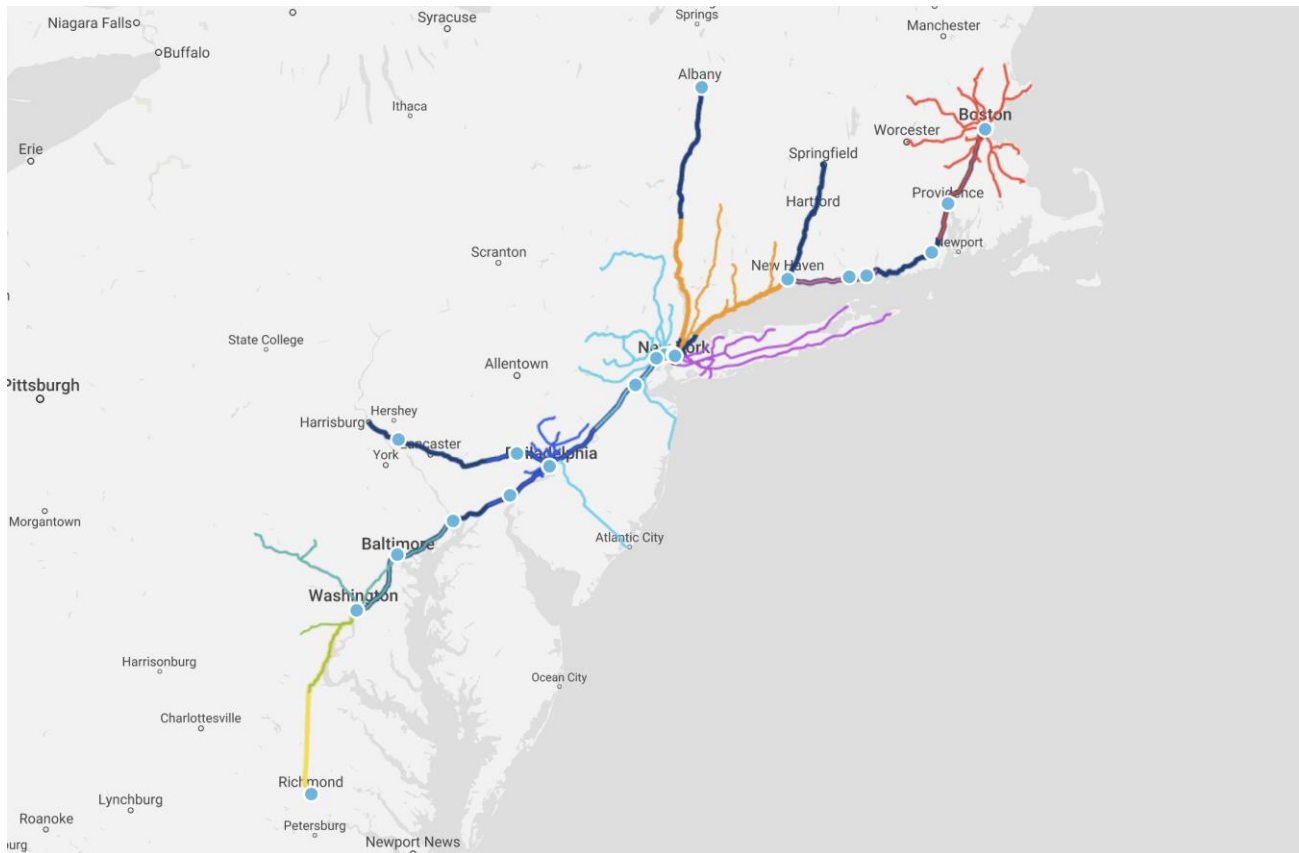
Station Symbol	Station Name
BAL	Baltimore, MD Penn Station
BBY	Boston, MA Back Bay Station
BWI	Baltimore, MD Marshall Airport
NWK	Newark, NJ Penn Station
NYP	New York, NY Penn Station
PAO	Paoli, Pennsylvania
PVD	Providence, Rhode Island
WAS	Washington DC, Union Station

Rail Miles traveled decreased significantly in 2019, per year, and APEI might consider encouraging rail transit above vehicle and short-haul flights to show a preference towards use of climate-friendly modes of transportation.



	Passenger Miles CY 2018	Passenger Miles CY 2019
Rail Travel	7,384	3,038

EPA emission factors were updated in 2020 to include Intercity Rail factors specific to the Northeast Corridor, and these factors have been used to calculate the CY19 inventory. Amtrak’s Northeast Corridor service extends from Boston to Washington DC, as shown on the map below. All rail trips taken in CY2019 were within the Northeast Corridor.



Source: <https://nec.amtrak.com/>

Vehicle Miles Traveled

Business travel in personal vehicles and rental cars were calculated using distances submitted for reimbursements. Data was provided by the accounting department. APUS and APEI values have been calculated separately. HCN values are included under APEI. Consistent with the CY18 inventory, mileage was estimated (based on averages) for January and February due to the low number of entries for those time periods. APEI was transitioning into the newly implemented electronic tracking system at that time. CY19 data was used as a proxy for CY18. December data was also estimated based on averages for the CY18 inventory at that time, as December data was not yet available. For CY19, a more complete data set was



provided, which contained December data as well. December estimates used in CY18 proved to be a bit high, and therefore emissions from this source are slightly lower when compared to the previous year estimates.

Business travel emissions from Taxi (including Car Service, Uber and Lyft) and Rental car data have been estimated using the 2019 IRS mileage reimbursement rate. This IRS rate increased from 54.5 cents per mile in 2018 to 58 cents per mile in 2019. This resulted in a lower mileage estimate, and therefore slightly lower emissions from this source than the previous year, which was using the same CY19 data as proxy. Revised business travel emission factors from EPA were slightly lower than the previous release, which also had an impact on final emission values for this category of business travel emissions. All Taxi and Rental Car emissions have been reported under APEI because the majority of entries (labeled as “Credit Card”) did not specify the entity.

4.3 Waste Disposal

Emissions from waste have been calculated using the national average decay rate emission factor for Mixed Municipal Solid Waste (MSW) from EPA’s WARM model, version 15¹³. The GHG emission factors used in WARM are based on a life cycle perspective and incorporate landfill technology (e.g., LFG recover, flaring etc.), carbon storage and emissions from transport.

WRI’s average-data method was used, which requires inputs of the total mass of waste generated in operations, and the proportion of waste being treated by different methods (e.g., percent landfilled, incinerated, recycled etc.). All waste was assumed to be landfilled mixed MSW (municipal solid waste), and the emission factor used was the National Average Decay Rate for Typical Collection. WRI guidance for Waste Generated in Operations states that “Any claims of avoided emissions associated with recycling should not be included in, or deducted from, the scope 3 inventory.” Therefore, recycled materials were not included in the emissions total.

Sundowner calculated weights from volume data obtained from monthly invoices, based on number of containers, container size and number of pickups per week. Volume values were converted to weight using the volume to weight conversion factor provided by Republic Services (45 lbs/cubic yard). In developing the CY18 inventory, the determination was made that the metric provided by Republic Services was more accurate than weight values calculated based on EPA’s conversion values.

Emissions did not decrease at Charles Town because the number of waste containers, pickups and container sizes were not reduced from the previous year. There is no way to know if bins were always full at pickup, or if actual waste reduction occurred.

An error was identified in the CY18 inventory calculations. Emissions had not been extrapolated across the entire year. This was corrected in both inventories.

Estimates for APEI’s remaining facilities were calculated based on number of employees. Waste data was not available for the Hondros School of Nursing, and therefore waste generation was estimated on a per person

¹³ <https://www.epa.gov/warm>

basis using the EPA-provided estimate of 4.38 lbs/person per day. This value presumably applies to a full day, so this value was adjusted to reflect 8 hours at work of an assumed 16 waking-hour day, and a year was assumed to contain 248 working days, consistent with the number of days used in calculating miles traveled in the employee commuter survey. The same method was applied to the APEI office in Baltimore and the APUS office in Manassas. Any changes in emission values for these facilities would only result from staffing changes. The employee count at HCN increased from 209 to 274 and this caused an increase in emissions reported in CY19 over the corrected CY18 data.

5. Quality Control Procedures

The inventory was submitted to APEI for review and comment, in addition to Sundowner Internal Review.

Internal Sundowner quality control procedure follows the WRI Protocol, Table 4: Generic Quality Management Measures, and includes a second party review of:

- Data gathering, input and handling activities
- Data documentation
- Calculating emissions and checking calculations

Data samples were reviewed for transcription errors, version control, data references, clear explanation of methodology, and logical and clear presentation of calculations.

6. Conclusion

APEI's total emissions, including APUS and HCN have been combined and reported in the table below:

American Public Education, Inc. (Includes APEI, APUS and HCN)	CY 2018 Base Year	CY 2019
Emissions Source	Emissions (metric tons CO2e)	Emissions (metric tons CO2e)
Scope 1 Emissions		
Stationary combustion	38.47	34.46
Mobile emissions	2.45	2.44
Fugitive emissions	58.88	99.81
Subtotal	99.80	136.71
Scope 2 Emissions - Location-based		
Electricity	4,169.36	3,234.69
District Heating	-	-
District Cooling	-	-
Subtotal	4,169.36	3,234.69
Scope 2 Emissions -Market-based		
Electricity	3,946.64	2,299.87
District Heating	-	-
District Cooling	-	-
Subtotal	3,946.64	2,299.87
Total Scope 1 and Location-Based Scope 2 Emissions	4,269.16	3,371.40
Total Scope 1 and Market-Based Scope 2 Emissions	4,046.44	2,436.58
Scope 3 Emissions		
Employee Commuting	1,867.48	1,445.08
Business Travel	408.16	313.63
Air	277.60	192.97
Rail	1.04	0.18
Vehicle	129.52	120.49
Waste Disposal	58.03	61.11

APPENDIX A: FACILITY LIST

American Public Education, Inc. (Parent Company)				
Facility Name (Or other identifier)	Facility Address	City	State	Zip
Executive offices	Quarry Lake	Baltimore	MD	21209
American Public University System				
Facility Name (Or other identifier)	Facility Address	City	State	Zip
Etter Hall	111 West Congress Street	Charles Town	WV	25414
Classroom Support	115 West Congress Street	Charles Town	WV	25414
Overnight Guest Quarters	200 South George Street	Charles Town	WV	25414
Conference Rooms and Guest Quarters	203 South George Street	Charles Town	WV	25414
Overnight Guest Quarters	208 South George Street	Charles Town	WV	25414
Security Office	216 South George Street	Charles Town	WV	25414
Facilities Department	219 South Charles Street	Charles Town	WV	25414
Leased to CDU	300 South George Street	Charles Town	WV	25414
Academics	330 North George Street	Charles Town	WV	25414
IT Center	303 West Third Avenue	Ranson	WV	25414
Finance/Admissions/Facilities	393 N. Lawrence Street	Charles Town	WV	25414
Facilities Storage	406 South Buchanan	Ranson	WV	25414
Marketing/Student Services	10110 Battleview Parkway 114	Manassas	VA	20109
Hondros College of Nursing				
Facility Name (Or other identifier)	Facility Address	City	State	Zip
Columbus	4140 Executive Parkway	Westerville	OH	43081
Cincinnati	7600 Tylers Pl. Blvd	West Chester	OH	45069
Cleveland	5005 Rockside Rd. Suite 130	Independence	OH	44131
Dayton	1810 Successful Drive	Fairborn	OH	45324
Toledo	1684 Woodlands Drive	Maumee	OH	43537

APPENDIX B: DOCUMENT REVISIONS

Version Number:			
<i>Version</i>	<i>Prepared By:</i>	<i>Date</i>	<i>Approved by (Name and Title):</i>
1.0	Brooke Farrell, Sundowner Sustainability Consulting Initial Report	2020-01-15	Christopher Symanoskie, VP Corporate Communications
1.1	Brooke Farrell, Sundowner Sustainability Consulting Updated to reflect 2019 changes Added Appendix D, Base Year Recalculation	2020-07-20	

APPENDIX C: SUNDOWNER GHG INVENTORY CALCULATION TOOL



Greenhouse Gas Inventory Calculation Tool

Client Name	American Public Education, Inc. (APEI)
City	Charles Town, West Virginia
Website	apei.com
Reporting Year	CY 2019
Reporting Protocol	WRI GHG Protocol
Control Approach	Operational Control
Reporting Program	Carbon Disclosure Project (CDP)
GHG's Reported	All Kyoto GHG's: CO2, CH4, N2O, HFCs, PFCs, SF6, NF3 (no PFC's SF6 or NH3 generated)
IPCC Assessment Report	AR4

Client Contact Information	Name	Email Address
Vice President, Corporate Communications	Christopher Symanoskie	csymanoskie@apei.com
Associate Vice President, Facilities	Michael Gunia	MGunia@apei.com
Facilities Director	Mel Dilley	MDilley@apei.com
HRIS & Reporting Analyst, Human Resources	April Mull	AMull@apei.com
Finance	Jeff Bostian	JBostian@apei.com

Additional Contacts	Name	Email Address
Potomac Edison	Tony Lewis	ablewis@firstenergycorp.com
Republic Services	Joan Beverley	JBeverley@republicservices.com

Sundowner Staff	Name	Email Address
Inventory Prepared by:	Brooke Farrell	brooke@sundownersustainability.com
Quality Control	Ellie Perry	ellie@sundownersustainability.com



Totals by Organization:

CY 2019	American Public University System (APUS)	Hondros School of Nursing	APEI
Emissions Source	Emissions (metric tons CO2e)	Emissions (metric tons CO2e)	Emissions (metric tons CO2e)
Scope 1 Emissions			
Stationary combustion	34.46	-	-
Mobile emissions	2.44	-	-
Fugitive emissions	46.50	53.32	-
Subtotal	83.40	53.32	-
Scope 2 Emissions - Location-based			
Electricity	2,062.28	1,155.13	17.28
District Heating	-	-	-
District Cooling	-	-	-
Subtotal	2,062.28	1,155.13	17.28
Scope 2 Emissions -Market-based			
Electricity	1,535.73	745.94	18.20
District Heating	-	-	-
District Cooling	-	-	-
Subtotal	1,535.73	745.94	18.20
Total Scope 1 and Location-Based Scope 2 Emissions	2,145.67	1,208.45	17.28
Total Scope 1 and Market-Based Scope 2 Emissions	1,619.12	799.26	18.20
Scope 3 Emissions			
Employee Commuting	983.45	458.28	3.35
Business Travel*	71.50	-	242.13
Air	-	-	192.97
Rail	-	-	0.18
Vehicle	71.50	-	48.99
Waste Disposal	34.13	26.79	0.20
	*Note that Some Business Travel for APUS has been reported under APEI	*Note that Business Travel for HCN has been reported under APEI	



Sundowner Sustainability Consulting

Scope 1: Emissions from Stationary Combustion				Totals:	tCO2e	
				APUS	34.46	
				HCN	0.00	
				APEI	0.00	
				Total	34.46	tCO2e
Organization	Facility Name	Facility Address	Building Number	State	Square Footage	Actual (A) or Estimated (E) consumption
APUS	HR	111 West Congress Street	111	WV	10,432	A
APUS	Classroom Support	115 West Congress Street	115	WV	3,500	A
APUS	Overnight Guests	200 South George Street	200	WV	3,100	A
APUS	Guests and Conference Rooms	203 South George Street	203	WV	3,000	A
APUS	Overnight Guests	208 South George Street	208	WV	4,844	A
APUS	Security/Overnight guests	216 South George Street	216	WV	5,400	A
APUS	Facilities	219 South Charles Street	219	WV	1,600	A
CDU	Leased to CDU	300 South George Street	300	WV	4,400	A
APUS	IT	303 West third Avenue Ranson	303 (generator)	WV	38,200	A
APUS	Academics	330 North George Street	330 (fire pump/generator)	WV	38,200	A
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393 (generator)	WV	105,000	A
APUS	Facilities Storage	406 South Buchanan Ranson	406	WV	6,300	A
APUS	Marketing/Student Services	10110 Battleview Parkway 114	Manassas	VA	24,986	E
APEI	Executive Offices	Quarry Lake	Baltimore	MD	2,500	E
HCN	Corporate Office	6530 West Campus Oval, Suite	New Albany	OH	5,671	A
HCN	Columbus	4140 Executive Parkway	Westerville	OH	20,913	A
HCN	Cincinnati	7600 Tylers Pl. Blvd	West Chester	OH	20,062	A
HCN	Cleveland	5005 Rockside Rd. Suite 130	Independence	OH	22,120	A
HCN	Dayton	1810 Successful Dr.	Fairborn	OH	17,216	A
HCN	Toledo	1684 Woodlands Drive	Maumee	OH	17,216	A
Data Sources:						
Estimated data calculated using 2012 CBECS energy intensities.						
Propane data obtained from Propane Usage 2019.xls						
Diesel gallons obtained from invoices for each generator location. Estimated based on daily average						
Diesel generators servicing Hondros College of Nursing are operated by building management and therefore not reported by APEI.						



Scope 1: Emissions from Stationary Combustion - Continued

Facility Address	Natural Gas Energy Use (MMBtu)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	tCO2e (metric tons CO2e)	Propane Energy Use (gallons)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	tCO2e (metric tons CO2e)	Diesel Emergency Generators (gallons)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	tCO2e (metric tons CO2e)
111 West Congress Street	-	-	-	-	0.00	163.70	0.94	0.00	0.00	0.94	31.00	0.32	0.00	0.00	0.32
115 West Congress Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
200 South George Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
203 South George Street	-	-	-	-	0.00	1,531.20	8.76	0.00	0.00	8.79	-	-	-	-	0.00
208 South George Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
216 South George Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
219 South Charles Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
300 South George Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
303 West third Avenue Ranson	-	-	-	-	0.00	-	-	-	-	0.00	328.00	3.35	0.00	0.00	3.36
330 North George Street	-	-	-	-	0.00	-	-	-	-	0.00	27.00	0.28	0.00	0.00	0.28
393 N. Lawrence Street	-	-	-	-	0.00	-	-	-	-	0.00	126.00	1.29	0.00	0.00	1.29
406 South Buchanan Ranson	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
10110 Battleview Parkway 114	366.80	19.46	0.00	0.00	19.48	-	-	-	-	0.00	-	-	-	-	0.00
Quarry Lake	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
6530 West Campus Oval, Suite 17	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
4140 Executive Parkway	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
7600 Tylers Pl. Blvd	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
5005 Rockside Rd. Suite 130	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
1810 Successful Dr.	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
1684 Woodlands Drive	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
Total Emissions					19.48					9.73					5.24

Scope 1: Emissions from Stationary Combustion - Continued				
Total Stationary Combustion				
CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	tCO2e (metric tons CO2e)	Comments
1.25	0.00	0.00	1.26	Diesel consumption pro-rated by days, assumed to be the same as 2018
-	-	-	0.00	
-	-	-	0.00	
8.76	0.00	0.00	8.79	
-	-	-	0.00	
-	-	-	0.00	
-	-	-	0.00	
-	-	-	0.00	Not operated by APEI
3.35	0.00	0.00	3.36	Diesel consumption pro-rated by days, assumed to be the same as 2018
0.28	0.00	0.00	0.28	Diesel consumption pro-rated by days, assumed to be the same as 2018
1.29	0.00	0.00	1.29	Diesel consumption pro-rated by days, assumed to be the same as 2018
-	-	-	0.00	
19.46	0.00	0.00	19.48	Actual data obtained for CY2019 (CBECs estimates used in CY2018)
-	-	-	0.00	
-	-	-	0.00	
-	-	-	0.00	
-	-	-	0.00	
-	-	-	0.00	
-	-	-	0.00	
Total Emissions			34.46	



Scope 1: Mobile Emissions		Totals:		tCO2e									
		APUS			2.44								
		HCN			0.00								
		APEI			0.00								
		Total			2.44	tCO2e							
Organization	Vehicle Make and Model	Year	Vehicle Type	Vehicle Type	Fuel Type	MPG*	Miles Traveled (estimated)	Gallons (estimated)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	tCO2e (metric tons CO2e)	
APUS	2015 Nissan NV200	2015	Cargo van	Gasoline Light-Duty Trucks	Motor Gasoline	24	1000	42	0.37	0.000009	0.000003	0.37	
APUS	2015 Ford F150 2WD	2015	Pickup truck	Gasoline Light-Duty Trucks	Motor Gasoline	17	1000	59	0.52	0.000009	0.000003	0.52	
APUS	2015 Nissan Quest	2015	Minivan	Gasoline Light-Duty Trucks	Motor Gasoline	20	1000	50	0.44	0.000009	0.000003	0.44	
APUS	2011 Chevrolet Silverado (Hybrid) 4WD	2011	Pickup truck	Gasoline Light-Duty Trucks	Motor Gasoline	20	1000	50	0.44	0.000010	0.000003	0.44	
APUS	2010 Ford Econoline E250**	2010	Commercial Van	Gasoline Light-Duty Trucks	Motor Gasoline	13	1000	77	0.68	0.000010	0.000004	0.68	
Total Emissions												2.44 tCO2e	
*City MPG used; vehicles travel between the two campuses, within a 4 block radius; source: https://fuelconomy.gov/													
**Model year 2005 used, no entry for 2010 on fuelconomy.gov website													
Hondros School of Nursing and APEI Baltimore do not have any Company Vehicles													

Scope 1: Fugitive Emissions		Totals:		tCO2e												
		APUS		46.50												
		HCN		53.32												
		APEI		0.00												
		Total		99.81 tCO2e												
Facility Air Conditioning																
Organization	Facility Name	Facility Address	Building Identifier	Square Footage	Actual (A) or Estimated (E) consumption	Equipment Type	New Equipment charge	Quantity of Refrigerant used to Service Equipment (lbs.)	Coolant recovered from decommissioned equipment	Charge Capacity (lbs.)	Refrigerant type	HFC (metric tons)	tCO ₂ e (metric tons CO ₂ e)	Comments		
APUS	HR	111 West Congress Street	111	10,432	A	Commercial AC	0	0	0	82.54	R-410A	0.00000	0.00			
APUS	HR	111 West Congress Street	111		A	Commercial AC	0	0	0	5.90	R-407C	0.00000	0.00			
APUS	Classroom Support	115 West Congress Street	115	3,500	A	Commercial AC	0	0	0	35.60	R-410A	0.00000	0.00			
APUS	Overnight Guests	200 South George Street	200	3,100	A	Commercial AC	0	0	0	41.40	R-410A	0.00000	0.00			
APUS	Guests and Conference Rooms	203 South George Street	203	3,000	A	Commercial AC	0	0	0	Not provided	R-410A	0.00000	0.00			
APUS	Overnight Guests	208 South George Street	208	4,844	A	Commercial AC	0	0	0	48.50	R-410A	0.00000	0.00			
APUS	Security/Overnight guests	216 South George Street	216	5,400	A	Commercial AC	0	0	0	45.50	R-410A	0.00000	0.00			
APUS	Security/Overnight guests	216 South George Street	216		A	Commercial AC	0	0	0	3.70	R-407C	0.00000	0.00			
APUS	Facilities	219 South Charles Street	219	1,600	A	Commercial AC	0	0	0	13.20	R-410A	0.00000	0.00			
CDU	Leased to CDU	300 South George Street	300	4,400	A	Commercial AC	0	0	0	41.10	R-410A	0.00000	0.00	Not operated by APEI		
CDU	Leased to CDU	300 South George Street	300		A	Commercial AC	0	0	0	8.10	R-407C	0.00000	0.00	Not operated by APEI		
APUS	IT	303 West third Avenue Ranson	303	38,200	A	Commercial AC	0	55	0	175.90	R-407C	0.02500	44.35	Changed to R-407C in 2019 from R-410A in 2018		
APUS	Academics	330 North George Street	330	45,000	A	Commercial AC	0	0	0	217.60	R-410A	0.00000	0.00			
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393	105,000	A	Commercial AC	0	0	0	866.70	R-410A	0.00000	0.00			
APUS	Facilities Storage	406 South Buchanan Ranson	406	6,300	A	Commercial AC	0	0	0	Not provided	R-410A	0.00000	0.00			
APUS	Marketing/Student Services	10110 Battleview Parkway 114	Manassas	24,986	A	Commercial AC	0	0	0	205.00	R-22	0.00000	0.00	R-22 is not a Kyoto GHG		
APEI	Executive offices	Quarry Lake	Baltimore	2,500	E	Commercial AC	0	0	0	unknown	R-410A	0.00000	0.00			
HCN	Corporate Office	6530 West Campus Oval, Suite 17	New Albany	5,671	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00113	2.37	Added in CY 2019 Inventory		
HCN	Columbus	4140 Executive Parkway	Westerville	24,970	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00499	10.43	Estimate based on square footage		
HCN	Cincinnati	7600 Tylers Pl. Blvd, West	West Chester	24,970	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00499	10.43	Estimate based on square footage		
HCN	Cleveland	5005 Rockside Rd. Suite 130	Independence	22,120	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00442	9.24	Estimate based on square footage		
HCN	Dayton	1815 Successful Dr. Fairborn	Fairborn	24,970	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00499	10.43	Estimate based on square footage		
HCN	Toledo	1684 Woodlands Drive, Maumee	Maumee	24,970	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00499	10.43	Estimate based on square footage		
Total HFC Emissions from Buildings													97.67	tCO ₂ e		
Vehicle Air Conditioning (estimated using Screening Method)																
Organization	Model Year	Make	Model	Vehicle Type	Loss Rate (Upper Bound Estimate)	Equipment Type	New Equipment charge	Quantity of Refrigerant used to Service Equipment (lbs.)	Coolant recovered from decommissioned equipment	Charge Capacity (lbs.)	Refrigerant Type	HFC (metric tons)	tCO ₂ e (metric tons CO ₂ e)	Comments		
APUS	2015	Nissan	NV200	Cargo van	20%	Vehicle AC	unknown	unknown	unknown	3.3	HFC-134a	0.0003	0.43			
APUS	2015	Ford	F150	pickup truck	20%	Vehicle AC	unknown	unknown	unknown	3.3	HFC-134a	0.0003	0.43			
APUS	2015	Nissan	Quest	Minivan	20%	Vehicle AC	unknown	unknown	unknown	3.3	HFC-134a	0.0003	0.43			
APUS	2011	Chevrolet	Silverado (Hybrid)	pickup truck	20%	Vehicle AC	unknown	unknown	unknown	3.3	HFC-134a	0.0003	0.43			
APUS	2010	Ford	Econoline E250	Commercial Van	20%	Vehicle AC	unknown	unknown	unknown	3.3	HFC-134a	0.0003	0.43			
Total HFC Emissions from Vehicle Air Conditioning													2.15	tCO ₂ e		
Data Sources:																
Utilities 2018.xls																
Facility refrigerant charge quantities tracked by facilities department																
Vehicle refrigerant estimates calculated using screening method identified in The Climate Registry General Reporting Protocol, v2.1, Chapter 16																
Upper bound charge capacity and upper bound loss rates for mobile air conditioning taken from Table 4.1 of TCR's Default Emission Factor Document, May 2019																
HCN and APEI Baltimore do not maintain any vehicles																



Sundowner Sustainability Consulting

Scope 2: Electricity Emissions: Location-Based										Totals:		tCO2e													
										APUS	2,062.28			HCN	1,155.13			APEI	17.28			Total	3,234.69	tCO2e	
Organization	Facility Name	Facility Address	Building Identifier	State	Zip	Square Footage	Energy Intensity (kWh/sq ft)	Actual (A) or Estimated (E) consumption	2019 Energy Use (kWh)	EPA eGRID Subregion	CO ₂ (metric tons)	CH ₄ (metric tons)	N ₂ O (metric tons)	tCO ₂ e (metric tons CO ₂ e)	Comments										
APUS	HR	111 West Congress Street	111	WV	25414	10,432	15	A	160,160	RFCW	84.7139	0.0085	0.0012	85.29											
APUS	Classroom Support	115 West Congress Street	115	WV	25414	3,500	20	A	71,223	RFCW	37.6722	0.0038	0.0005	37.93											
APUS	Overnight Guests	200 South George Street	200	WV	25414	3,100	12	A	36,370	RFCW	19.2373	0.0019	0.0003	19.37											
APUS	Overnight Guests	203 South George Street	203	WV	25414	3,000	6	A	17,052	RFCW	9.0194	0.0009	0.0001	9.08											
APUS	Overnight Guests	208 South George Street	208	WV	25414	4,844	8	A	39,212	RFCW	20.7405	0.0021	0.0003	20.88											
APUS	Security/Overnight guests	216 South George Street	216	WV	25414	5,400	20	A	109,033	RFCW	57.6711	0.0058	0.0008	58.07											
APUS	Facilities	219 South Charles Street	219	WV	25414	1,600	28	A	45,159	RFCW	23.8861	0.0024	0.0003	24.05											
CDU	Leased to CDU	300 South George Street	300	WV	25414	4,400	0	A	0	RFCW	0.0000	0.0000	0.0000	0.00	Not Operated by APEI										
APUS	IT	303 West third Avenue Ranson	303	WV	25414	38,200	27	A	1,042,672	RFCW	551.5035	0.0553	0.0080	555.28											
APUS	Academics	330 North George Street	330	WV	25414	45,000	10	A	429,504	RFCW	227.1788	0.0228	0.0033	228.74											
APUS	Academics	330 North George Street (Solar)	330 Building Solar Array (22 kW)	WV	25414	n/a	n/a	A	26,149	RFCW	13.8311	0.0014	0.0002	13.93	Source: Solar production at building 330 (metered)										
APUS	Academics	330 North George Street (Fire Pump)	330 (fire pump/generator)	WV	25414	n/a	n/a	A	270	RFCW	0.1428	0.0000	0.0000	0.14											
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393	WV	25414	105,000	12	A	1,239,261	RFCW	655.4859	0.0658	0.0096	659.98											
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street (solar)	393 Building Solar Array (375 kW)	WV	25414	n/a	n/a	A	388,851	RFCW	205.6761	0.0206	0.0030	207.09	Source: Total RECs sold in 2019 (415 MWh) from SREC, minus generation at Bldg 330										
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street (generator)	393 (generator)	WV	25414	n/a	n/a	A	520	RFCW	0.2750	0.0000	0.0000	0.28											
APUS	Facilities Storage	406 South Buchanan Ranson	406	WV	25414	6,300	4	A	25,390	RFCW	13.4296	0.0013	0.0002	13.52											
APUS	Marketing/Student Services	10110 Battlevue Parkway 114	Manassas	VA	20109	24,986	15	A	379,347	SRVC	127.9038	0.0115	0.0015	128.65	Invoices covering 1/8/2019 - 1/2/2020, Meter 830137										
APEI	Executive offices	Quarry Lake	Baltimore	MD	21209	2,500	21	E	52,926	RFCE	17.1882	0.0015	0.0002	17.28	Estimated using CBECs 2012 Energy Intensity factor for office space										
HCN	Corporate	6530 West Campus Oval, Suite 170	New Albany	OH	43054	5,671	22	E	124,557	RFCW	65.8824	0.0066	0.0010	66.33											
HCN	Columbus	4140 Executive Parkway, Westerville	Westerville	OH	43081	20,913	22	E	459,330	RFCW	242.9550	0.0244	0.0035	244.62	Estimates included kwh for building heating										
HCN	Cincinnati	7600 Tylers Pl. Blvd, West Chester	West Chester	OH	45069	20,062	22	E	440,639	RFCW	233.0686	0.0234	0.0034	234.67											
HCN	Cleveland	5005 Rockside Rd. Suite 130, Independence	Independence	OH	44131	22,120	13	E	278,712	RFCW	147.4199	0.0148	0.0021	148.43	Estimate does not include kWh for building heating. Used CBECs estimation methodology. Did not include kWh from heating because electricity alone is consistent with estimate from metered data based on 11 months of data (244,175 kWh) .										
HCN	Dayton	1810 Successful Dr. Fairborn	Fairborn	OH	45324	17,216	22	E	378,130	RFCW	200.0054	0.0201	0.0029	201.38											
HCN	Toledo	1684 Woodlands Drive, Maumee	Maumee	OH	43537	22,203	22	E	487,664	RFCW	257.9415	0.0259	0.0038	259.71											
Total									6,232,132					Total Emissions	3,234.69										





Sundowner Sustainability Consulting

Scope 2: Electricity Emissions: Market-Based		Totals:		tCO2e																			
		APUS		1,535.73																			
		HCN		745.94																			
		APEI		18.20																			
		Total		2,299.87		tCO2e																	
Organization	Facility Name	Facility Address	Building Number	State	Zip	Square Footage	Actual (A) or Estimated (E) consumption	Energy Use (kWh)	Purchased/Sold RECs or other Contractual Instruments (converted to kWh)	EPA eGRID Subregion	Green-e Subregion	Electricity Source	CO ₂ (metric tons)	CH ₄ (metric tons)	N ₂ O (metric tons)	tCO ₂ e (metric tons CO ₂ e)	Comments						
APUS	HR	111 West Congress Street	111	WV	25414	10,432	A	160,160	0	RFCW	RFC	grid	55.08	0	0	55.08							
APUS	Classroom Support	115 West Congress Street	115	WV	25414	3,500	A	71,223	0	RFCW	RFC	grid	24.49	0	0	24.49							
APUS	Overnight Guests	200 South George Street	200	WV	25414	3,100	A	36,370	0	RFCW	RFC	grid	12.51	0	0	12.51							
APUS	Guests and Conference Rooms	203 South George Street	203	WV	25414	3,000	A	17,052	0	RFCW	RFC	grid	5.86	0	0	5.86							
APUS	Overnight Guests	208 South George Street	208	WV	25414	4,844	A	39,212	0	RFCW	RFC	grid	13.49	0	0	13.49							
APUS	Security/Overnight guests	216 South George Street	216	WV	25414	5,400	A	109,033	0	RFCW	RFC	grid	37.50	0	0	37.50							
APUS	Facilities	219 South Charles Street	219	WV	25414	1,600	A	45,159	0	RFCW	RFC	grid	15.53	0	0	15.53							
CDU	Leased to CDU	300 South George Street	300	WV	25414	4,400	A	0	0	RFCW	RFC	grid	0.00	0	0	0.00	Not Operated by APEI in CY2019						
APUS	IT	303 West third Avenue Ranson	303	WV	25414	38,200	A	1,042,672	0	RFCW	RFC	grid	358.58	0	0	358.58							
APUS	Academics	330 North George Street	330	WV	25414	45,000	A	429,504	0	RFCW	RFC	grid	147.71	0	0	147.71	Confirm this is a reasonable amount to generate from this size system						
APUS	Academics	330 North George Street (Solar)	330 Building Solar Array (22 kW)	WV	25414	45,000	A	26,149	-26,000	RFCW	RFC	solar	17.93	0	0	17.93	Source: Solar production at building 330 (metered)						
APUS	Academics	330 North George Street (Fire Pump)	330 (fire pump/generator)	WV	25414	38,200	A	270	0	RFCW	RFC	grid	0.09	0	0	0.09							
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393	WV	25414	105,000	A	1,239,261	0	RFCW	RFC	grid	426.19	0	0	426.19							
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street (solar)	393 Building Solar Array (375 kW)	WV	25414	105,000	A	388,851	-389,000	RFCW	RFC	solar	267.51	0	0	267.51	Source: Total RECs sold in 2019 (415 MWh) from SREC, minus generation at Bldg 330						
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street (generator)	393 (generator)	WV	25414	105,000	A	520	0	RFCW	RFC	grid	0.18	0	0	0.18							
APUS	Facilities Storage	406 South Buchanan Ranson	406	WV	25414	6,300	A	25,390	0	RFCW	RFC	grid	8.73	0	0	8.73							
APUS	Marketing/Student Services	10110 Battleview Parkway 114		Manassas	VA	20109	24,986	E	379,347	0	SRVC	SERC	grid	144.35	0	0	144.35						
APEI	Executive offices	Quarry Lake		Baltimore	MD	21209	2,500	E	52,936	0	RFCW	RFC	grid	18.20	0	0	18.20	Estimated using CBECS 2012 Energy Intensity factor for office space					
HCN	Corporate	6530 West Campus Oval, Suite 170		New Albany	OH	43054	5,671	E	124,557	0	RFCW	RFC	grid	42.84	0	0	42.84						
HCN	Columbus	4140 Executive Parkway, Westerville		Westerville	OH	43081	20,913	E	459,330	0	RFCW	RFC	grid	157.97	0	0	157.97						
HCN	Cincinnati	7600 Tylers Pl. Blvd, West Chester		West Chester	OH	45069	20,062	E	440,639	0	RFCW	RFC	grid	151.54	0	0	151.54						
HCN	Cleveland	1810 Successful Dr. Fairborn		Independence	OH	44131	22,120	E	278,712	0	RFCW	RFC	grid	95.85	0	0	95.85						
HCN	Dayton	1810 Successful Dr. Fairborn		Fairborn	OH	45324	17,216	E	378,130	0	RFCW	RFC	grid	130.04	0	0	130.04						
HCN	Toledo	1684 Woodlands Drive, Maumee		Maumee	OH	43537	22,203	E	487,664	0	RFCW	RFC	grid	167.71	0	0	167.71						
Total																Total Emissions	2,299.87						
Data Source: kWh consumption reports provided by Potomac Edison																							
Notes:																							
Utility emission factor for Dominion Energy is unverified, and therefore not used in GHG Calculations.																							
Green-e, "Green-e Energy Residual Mix Emissions Rates (2019), June 20, 2019, https://www.green-e.org/2019-residual-mix																							
Generation data was not available for the Solar Array at 330 N. George Street, so it was calculated from REC sales (RECs were sold for all solar power generated).																							
RECs sold are identified as negative values and have been converted to kWh for calculation purposes. RECs are sold in MWh (1 REC = 1 MWh).																							
Green-E does not publish emission factors for CH4 and N2O. Standard practice to not report these emissions when using Green-E																							
For HCN facility estimates, building heating was included by converting heating values from natural gas use into kWh																							



Scope 3: Employee Commuting				Totals:	tCO2e			
				APUS	983.45			
				HCN	458.28			
				APEI	3.35			
				Total	1,445.08	tCO2e		
Employee Commuter Survey Results:								
Organization	What mode of transportation do you typically utilize?	Annual Commute Totals (miles)	Number of Employees	CO2 (metric ton GHG)	CH4 (metric ton GHG)	N2O (metric ton GHG)	CO2e (metric tons)	
Charles Town	Passenger Car: includes passenger cars, minivans, SUV's, and small pickup trucks	4,071,833	550	1,364.064	0.037	0.033	1,374.69	
Charles Town	Light-Duty Truck: includes full-size pick-up trucks, full-size vans, and extended-length SUV's	148,006	16	68.231	0.002	0.001	68.72	
Charles Town	Motorcycle	0	0	n/a	n/a	n/a	n/a	
Charles Town	Walk	0	0	n/a	n/a	n/a	n/a	
Charles Town	Bicycle	0	0	n/a	n/a	n/a	n/a	
Charles Town	Bus	0	0	n/a	n/a	n/a	n/a	
Charles Town	Carpool	0	42	n/a	n/a	n/a	n/a	
APUS Total		4,219,839	608				1,443.40	(surveyed)
							863	Employees Surveyed
Estimates based on surveyed data:							1.67	tCO2e/employee
Organization	Location		Number of Employees not covered in survey	CO2 (metric ton GHG)	CH4 (metric ton GHG)	N2O (metric ton GHG)	CO2e (metric tons)	
APUS	Charles Town (Includes APUS and APEI)		524				876.41	
APUS	Manassas		64				107.04	
HCN	Hondros College of Nursing		274				458.28	tCO2e
APEI	APEI Baltimore Office		2				3.35	tCO2e
							1,445.08	(estimated)
Notes:								
Data Source: EE Commute Survey Report 12.19.2019 - Sundowner Report								
Distance-based method								
863 Surveys completed								
Assumed 248 working days per year (261 average work days - 13 PTO days)								
Survey data includes APUS employees only								

Scope 3 Business Travel - Air and Rail Miles					Emission Calculations		
	Miles:			Air		Rail	
Short Haul	1,099	Air Travel - Short Haul (< 300 miles)	CO2	191.15 metric tons		0.18 metric tons	
Medium Haul	507,387	Air Travel - Medium Haul (>= 300 miles, < 2300 miles)	CH4	0.00 metric tons		0.00002 metric tons	
Long Haul	748,070	Air Travel - Long Haul (>= 2300 miles)	N2O	0.01 metric tons		0.00000 metric tons	
			tCO2e	192.97 metric tons		0.18 metric tons	
Rail Travel	3,038	Intercity Rail - Northeast Corridor (i.e. Amtrak) C					
Notes:							
All air and rail business travel reported under APEI, as data does not provide breakdown between APUS, HCN and APEI.							
Segment Itinerary WAS BAL was changed from long haul air (9,414 miles identified in the trip_miles column) to rail. WAS is not an airport and BAL is Batman Airport, Turkey. Actual route is Washington to B. Per Direct Travel, XXX ZZZ charges are for paid seats for travelers. Miles were removed for XXX ZZZ itinerary. IN 2019, only one XXX ZZZ entry had miles associated with it. Removals were highlighted in grey							
Data Source:							
APUS Trip Detail 2019							

Scope 3 Business Travel - Personal Vehicle Miles						Notes:			
						File source: Mileage data.xlsx, Mileage and Reimbursement Amounts_2019			
						HCN Data is included under APEI			
Data Provided			Mileage Estimates			Emission Calculations			
APEI Mileage		APUS Mileage	APEI Mileage		APUS Mileage	APEI Mileage		APUS Mileage	
January	46	436	January	3,200	18,147	estimated*	Total Miles	36,436	211,786
February	2,984	3,449	February	3,200	18,147	estimated*	Total CO2	12.2061	70.9482
March	4,809	17,197	March	4,809	17,197		Total CH4	0.0003	0.0019
April	5,484	16,064	April	5,484	16,064		Total N2O	0.0003	0.0017
May	6,786	26,008	May	6,786	26,008		Total CO2e (metric tons)	12.30	71.50
June	1,925	14,204	June	1,925	14,204				
July	1,141	14,983	July	1,141	14,983		Total		83.80
August	2,024	13,012	August	2,024	13,012				
September	1,596	25,121	September	1,596	25,121				
October	3,184	21,261	October	3,184	21,261				
November	1,847	15,477	November	1,847	15,477				
December	1,241	12,164	December	1,241	12,164				
Total Miles	33,067	179,375	Total Miles	36,436	211,786				
		212,442			248,222				
						* Data estimated for January and February of 2019 due to incomplete data			

Scope 3 Business Travel - Car rentals and Taxi's				Notes:		
				File source: "Car rental-Uber-Taxi.xls"		
				All data reported under APEI (Includes APUS)		
				Mileage estimates calculated from IRS 2019 business travel rate.		
				2018 entries were excluded from totals (4 entries)		
				Dataset re-run for CY19 inventory to incorporate any late expenses		
Mileage Estimate Calculations		Emission Calculations				
Costs (\$)	Mileage Estimate	Total Miles				
Car Rental	\$5,328.14	9,186	108,664	Total CO2		36.40
Taxi	\$48,640.45	83,863		Total CH4		0.0010
Fuel	\$8,972.46	15,470		Total N2O		0.0009
Mileage	\$84.00	145		Total CO2e (metric tons)		36.69
\$	63,025.05	108,664				

			Totals:	tCO2e					
Scope 3: Waste Disposal Emissions			APUS	34.13					
			HCN	26.79					
			APEI	0.20					
			Total	61.11		tCO2e			
Organization	Pickup Location	Actual or Estimate	Employee Count	lbs./day*	lbs/year	short tons	tCO2e	Comments	
APUS	330 N George St	A	n/a	n/a	n/a	56.31	20.27	Short Tons calculated from invoice data (bin size and frequency of pickups)	
APUS	111 W. Congress	A	n/a	n/a	n/a	7.04	2.53	Short Tons calculated from invoice data (bin size and frequency of pickups)	
APUS	303 W. 3rd St	A	n/a	n/a	n/a	14.08	5.07	Short Tons calculated from invoice data (bin size and frequency of pickups)	
APUS	Manassas	E	64	140	34,760	17.38	6.26		
APEI	Baltimore	E	2	4	1,086	0.54	0.20		
HCN	Corporate	E	19.0	42	10,319	5.16	1.86		
HCN	Columbus	E	78.0	171	42,363	21.18	7.63		
HCN	Cincinnati	E	41.0	90	22,268	11.13	4.01		
HCN	Cleveland	E	47.0	103	25,527	12.76	4.59		
HCN	Dayton	E	43.0	94	23,354	11.68	4.20		
HCN	Toledo	E	46.0	101	24,984	12.49	4.50		
HCN	Indianapolis	E	0	0	-	0.00	0.00	Indianapolis campus not staffed in 2019	
Total					184,660.80	169.76	61.11		
Data Sources:									
https://archive.epa.gov/epawaste/nonhaz/municipal/web/pdf/2012_msw_fs.pdf									
https://archive.epa.gov/epawaste/nonhaz/municipal/web/html/									
Notes:									
4.38 lbs. MWS generated per person per day									
MSW emissions value consistent with WARM v15 Model (small difference to do rounding of emission factor)									
Assumed 248 working days per year (261 average work days - 13 PTO days)									
For HCN, assumed all workers generate the same amount of waste whether full-time or part-time.									
For lbs./day, assume 8 hours of 16 waking hours per day (50% of day) spent at work									
Per WRI Category 5: Waste Generated in Operations, "Any claims of avoided emissions associated with recycling should not be included in, or deducted from, the scope 3 inventory, but may instead be reported separately from scope 1, scope 2, and scope 3 emissions"									

APPENDIX D: BASE YEAR RECALCULATION

American Public Education, Inc. (APEI)	CY 2018 Base Year
Emissions Source	Emissions (metric tons CO2e)
Scope 1 Emissions	
Stationary combustion	38.47
Mobile emissions	2.44
Fugitive emissions	58.88
Subtotal	99.80
Scope 2 Emissions - Location-based	
Electricity	3,900.88
District Heating	-
District Cooling	-
Subtotal	3,900.88
Scope 2 Emissions -Market-based	
Electricity	2,809.76
District Heating	-
District Cooling	-
Subtotal	2,809.76
Total Scope 1 and Location-Based Scope 2 Emissions	4,000.68
Total Scope 1 and Market-Based Scope 2 Emissions	2,909.56
Scope 3 Emissions	
Employee Commuting	1,818.05
Business Travel	401.46
Air	274.51
Rail	0.84
Vehicle	126.11
Waste Disposal	58.03
Municipal Solid Waste	58.03

Totals by Organization:

American Public University System (APUS)		CY 2018 Base Year	Hondros School of Nursing		CY 2018 Base Year	APEI Baltimore		CY 2018 Base Year
Emissions Source	Emissions (metric tons CO2e)		Emissions Source	Emissions (metric tons CO2e)		Emissions Source	Emissions (metric tons CO2e)	
Scope 1 Emissions			Scope 1 Emissions			Scope 1 Emissions		
Stationary combustion	38.47		Stationary combustion	-		Stationary combustion	-	
Mobile emissions	2.44		Mobile emissions	-		Mobile emissions	-	
Fugitive emissions	6.89		Fugitive emissions	50.95		Fugitive emissions	1.05	
Subtotal	47.80		Subtotal	50.95		Subtotal	1.05	
Scope 2 Emissions - Location-based			Scope 2 Emissions - Location-based			Scope 2 Emissions - Location-based		
Electricity	2,566.87		Electricity	1,316.73		Electricity	17.28	
District Heating	-		District Heating	-		District Heating	-	
District Cooling	-		District Cooling	-		District Cooling	-	
Subtotal	2,566.87		Subtotal	1,316.73		Subtotal	17.28	
Scope 2 Emissions -Market-based			Scope 2 Emissions -Market-based			Scope 2 Emissions -Market-based		
Electricity	1,941.27		Electricity	850.29		Electricity	18.20	
District Heating	-		District Heating	-		District Heating	-	
District Cooling	-		District Cooling	-		District Cooling	-	
Subtotal	1,941.27		Subtotal	850.29		Subtotal	18.20	
Total Scope 1 and Location-Based Scope 2 Emissions	2,614.67		Total Scope 1 and Location-Based Scope 2 Emissions	1,367.68		Total Scope 1 and Location-Based Scope 2 Emissions	18.33	
Total Scope 1 and Market-Based Scope 2 Emissions	1,989.07		Total Scope 1 and Market-Based Scope 2 Emissions	901.24		Total Scope 1 and Market-Based Scope 2 Emissions	19.25	
Scope 3 Emissions			Scope 3 Emissions			Scope 3 Emissions		
Employee Commuting	1,443.40		Employee Commuting	371.30		Employee Commuting	3.35	
Business Travel*	74.37		Business Travel*	-		Business Travel	327.09	
Air	-		Air	-		Air	274.51	
Rail	-		Rail	-		Rail	0.84	
Vehicle	74.37		Vehicle	-		Vehicle	51.74	
Waste Disposal	37.35		Waste Disposal	20.48		Waste Disposal	0.20	
Municipal Solid Waste	37.35		Municipal Solid Waste	20.48		Municipal Solid Waste	0.20	

*Note that Some Business Travel for APUS has been reported under APEI

*Note that Business Travel for HCN has been reported under APEI

Scope 1: Emissions from Stationary Combustion				Totals:	tCO2e	
				APUS	38.47	
				HCN	0.00	
				APEI	0.00	
				Total	38.47 tCO2e	
Organization	Facility Name	Facility Address	Building Number	State	Square Footage	Actual (A) or Estimated (E) consumption
APUS	HR	111 West Congress Street	111	WV	10,432	A
CDU	Leased to CDU	115 West Congress Street	115	WV	3,500	A
APUS	Overnight Guests	200 South George Street	200	WV	3,100	A
APUS	Guests and Conference Rooms	203 South George Street	203	WV	3,000	A
APUS	Overnight Guests	208 South George Street	208	WV	4,844	A
APUS	Security/Overnight guests	216 South George Street	216	WV	5,400	A
APUS	Facilities	219 South Charles Street	219	WV	1,600	A
APUS	TBD	300 South George Street	300	WV	4,400	A
APUS	IT	303 West third Avenue Ranson	303 (generator)	WV	38,200	A
APUS	Academics	330 North George Street	330 (fire pump/generator)	WV	38,200	A
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393 (generator)	WV	105,000	A
APUS	Facilities Storage	406 South Buchanan Ranson	406	WV	6,300	A
APUS	Marketing/Student Services	10110 Battleview Parkway 114	Manassas	VA	24,986	E
APEI	Executive offices	Quarry Lake	Baltimore	MD	2,500	E
HCN	Columbus	4140 Executive Parkway	Westerville	OH	24,970	A
HCN	Cincinnati	7600 Tylers Pl. Blvd	West Chester	OH	24,970	A
HCN	Cleveland	5005 Rockside Rd. Suite 130	Independence	OH	22,120	A
HCN	Dayton	1810 Successful Dr.	Fairborn	OH	24,970	A
HCN	Toledo	1684 Woodlands Drive	Maumee	OH	24,970	A
Data Sources:						
Estimated data calculated using 2012 CBECS energy intensities.						
Propane data obtained from Utilities 2018.xlsx						
Diesel gallons obtained from invoices for each generator location						
Diesel generators servicing Hondros College of Nursing are operated by building management and therefore not reported by APEI.						

Scope 1: Emissions from Stationary Combustion - Continued															
Facility Address	Natural Gas Energy Use (MMBtu)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	tCO2e (metric tons CO2e)	Propane Energy Use (gallons)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	tCO2e (metric tons CO2e)	Diesel Emergency Generators (gallons)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	tCO2e (metric tons CO2e)
111 West Congress Street	-	-	-	-	0.00	160.30	0.92	0.00	0.00	0.92	31.00	0.32	0.00	0.00	0.32
115 West Congress Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
200 South George Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
203 South George Street	-	-	-	-	0.00	1,547.50	8.85	0.00	0.00	8.89	-	-	-	-	0.00
208 South George Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
216 South George Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
219 South Charles Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
300 South George Street	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
303 West third Avenue Ranson	-	-	-	-	0.00	-	-	-	-	0.00	328.00	3.35	0.00	0.00	3.36
330 North George Street	-	-	-	-	0.00	-	-	-	-	0.00	27.00	0.28	0.00	0.00	0.28
393 N. Lawrence Street	-	-	-	-	0.00	-	-	-	-	0.00	126.00	1.29	0.00	0.00	1.29
406 South Buchanan Ranson	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
10110 Battleview Parkway 114	440.93	23.40	0.00	0.00	23.42	-	-	-	-	0.00	-	-	-	-	0.00
Quarry Lake	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
4140 Executive Parkway	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
7600 Tylers Pl. Blvd	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
5005 Rockside Rd. Suite 130	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
1810 Successful Dr.	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
1684 Woodlands Drive	-	-	-	-	0.00	-	-	-	-	0.00	-	-	-	-	0.00
Total Emissions					23.42					9.81					5.24

Scope 1: Emissions from Stationary Combustion - Continued				
Total Stationary Combustion				
CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	tCO2e (metric tons CO2e)	Comments
1.23	0.00	0.00	1.24	
-	-	-	0.00	Not operated by APEI
-	-	-	0.00	
8.85	0.00	0.00	8.89	
-	-	-	0.00	
-	-	-	0.00	
-	-	-	0.00	
-	-	-	0.00	
3.35	0.00	0.00	3.36	
0.28	0.00	0.00	0.28	
1.29	0.00	0.00	1.29	
-	-	-	0.00	
23.40	0.00	0.00	23.42	Estimated using CBECS
-	-	-	0.00	
-	-	-	0.00	All building heating at HCN is electric
-	-	-	0.00	All building heating at HCN is electric
-	-	-	0.00	All building heating at HCN is electric
-	-	-	0.00	All building heating at HCN is electric
-	-	-	0.00	All building heating at HCN is electric
Total Emissions			38.47	

Scope 1: Mobile Emissions										Totals:			
										tCO2e			
										APUS 2.45			
										HCN 0.00			
										APEI 0.00			
										Total 2.45 tCO2e			
Organization	Vehicle Make and Model	Year	Vehicle Type	Vehicle Type	Fuel Type	MPG*	Miles Traveled (estimated)	Gallons (estimated)	CO2 (metric tons)	CH4 (metric tons)	N2O (metric tons)	tCO2e (metric tons CO2e)	
APUS	2015 Nissan NV200	2015	Cargo van	Gasoline Light-Duty Trucks	Motor Gasoline	24	1000	42	0.37	0.000016	0.000007	0.37	
APUS	2015 Ford F150 2WD	2015	pickup truck	Gasoline Light-Duty Trucks	Motor Gasoline	17	1000	59	0.52	0.000016	0.000007	0.52	
APUS	2015 Nissan Quest	2015	Minivan	Gasoline Light-Duty Trucks	Motor Gasoline	20	1000	50	0.44	0.000016	0.000007	0.44	
APUS	2011 Chevrolet Silverado (Hybrid) 4WD	2011	pickup truck	Gasoline Light-Duty Trucks	Motor Gasoline	20	1000	50	0.44	0.000016	0.000007	0.44	
APUS	2010 Ford Econoline E250**	2010	Commercial Van	Gasoline Light-Duty Trucks	Motor Gasoline	13	1000	77	0.68	0.000016	0.000007	0.68	
Total Emissions												2.45	
*City MPG used; vehicles travel between the two campuses, within a 4 block radius; source: https://fuelconomy.gov/													
**Model year 2005 used, no entry for 2010 on fuelconomy.gov website													
Hondros School of Nursing and APEI Baltimore do not have any Company Vehicles													



Sundowner Sustainability Consulting

Scope 1: Fugitive Emissions		Totals:		tCO2e												
		APUS		6.89												
		HCN		50.95												
		APEI		1.05												
		Total		58.88 tCO2e												
Facility Air Conditioning																
Organization	Facility Name	Facility Address	Building Identifier	Square Footage	Actual (A) or Estimated (E)	Equipment Type	New Equipment charge	Quantity of Refrigerant used to Service Equipment (lbs.)	Coolant recovered from decommissioned equipment	Charge Capacity (lbs.)	Refrigerant type	HFC (metric tons)	tCO2e (metric tons CO2e)	Comments		
APUS	HR	111 West Congress Street	111	10,432	A	Commercial AC	0	0	0	82.54	R-410A	0.00000	0.00			
APUS	HR	111 West Congress Street	111		A	Commercial AC	0	0	0	5.90	R-407C	0.00000	0.00			
CDU	Leased to CDU	115 West Congress Street	115	3,500	A	Commercial AC	0	0	0	35.60	R-410A	0.00000	0.00	Leased to CDU - out of operational control?		
APUS	Overnight Guests	200 South George Street	200	3,100	A	Commercial AC	0	0	0	41.40	R-410A	0.00000	0.00			
APUS	Guests and Conference Rooms	203 South George Street	203	3,000	A	Commercial AC	0	0	0	Not provided	R-410A	0.00000	0.00			
APUS	Overnight Guests	208 South George Street	208	4,844	A	Commercial AC	0	0	0	48.50	R-410A	0.00000	0.00			
APUS	Security/Overnight guests	216 South George Street	216	5,400	A	Commercial AC	0	0	0	45.50	R-410A	0.00000	0.00			
APUS	Security/Overnight guests	216 South George Street	216		A	Commercial AC	0	0	0	3.70	R-407C	0.00000	0.00			
APUS	Facilities	219 South Charles Street	219	1,600	A	Commercial AC	0	0	0	13.20	R-410A	0.00000	0.00			
APUS	TBD	300 South George Street	300	4,400	A	Commercial AC	0	0	0	41.10	R-410A	0.00000	0.00			
APUS	TBD	300 South George Street	300		A	Commercial AC	0	0	0	8.10	R-407C	0.00000	0.00			
APUS	IT	303 West third Avenue Ranson	303	38,200	A	Commercial AC	0	0	0	175.90	R-410A	0.00000	0.00			
APUS	Academics	330 North George Street	330	45,000	A	Commercial AC	0	5	0	217.60	R-410A	0.00227	4.75			
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393	105,000	A	Commercial AC	0	0	0	866.70	R-410A	0.00000	0.00			
APUS	Facilities Storage	406 South Buchanan Ranson	406	6,300	A	Commercial AC	0	0	0	Not provided	R-410A	0.00000	0.00			
APUS	Marketing/Student Services	10110 Battleview Parkway 114	Manassas	24,986	A	Commercial AC	0	0	0	205.00	R-22	0.00000	0.00	R-22 is not a Kyoto GHG		
APEI	Executive offices	Quarry Lake	Baltimore	2,500	E	Commercial AC	0	1.10	0	unknown	R-410A	0.00050	1.05			
HCN	Columbus	4140 Executive Parkway	Westerville	24,970	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00499	10.43	Estimate based on square footage		
HCN	Cincinnati	7600 Tylers Pl. Blvd, West Chester	West Chester	24,970	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00499	10.43	Estimate based on square footage		
HCN	Cleveland	5005 Rockside Rd, Suite 130	Independence	22,120	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00442	9.24	Estimate based on square footage		
HCN	Dayton	1810 Successful Dr. Fairborn	Fairborn	24,970	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00499	10.43	Estimate based on square footage		
HCN	Toledo	1684 Woodlands Drive, Maumee	Maumee	24,970	E	Commercial AC	unknown	unknown	unknown	unknown	R-410A	0.00499	10.43	Estimate based on square footage		
Total HFC Emissions from Buildings													56.74	tCO2e		
Vehicle Air Conditioning (estimated using Screening Method)																
Organization	Model Year	Make	Model	Vehicle Type	Loss Rate (Upper Bound Estimate)	Equipment Type	New Equipment charge	Quantity of Refrigerant used to Service Equipment (lbs.)	Coolant recovered from decommissioned equipment	Charge Capacity (lbs.)	Refrigerant Type	HFC (metric tons)	tCO2e (metric tons CO2e)	Comments		
APUS	2015	Nissan	NV200	Cargo van	20%	Vehicle AC	unknown	unknown	unknown	3.3	HFC-134a	0.00003	0.43			
APUS	2015	Ford	F150	pickup truck	20%	Vehicle AC	unknown	unknown	unknown	3.3	HFC-134a	0.00003	0.43			
APUS	2015	Nissan	Quest	Minivan	20%	Vehicle AC	unknown	unknown	unknown	3.3	HFC-134a	0.00003	0.43			
APUS	2011	Chevrolet	Silverado (Hybrid)	pickup truck	20%	Vehicle AC	unknown	unknown	unknown	3.3	HFC-134a	0.00003	0.43			
APUS	2010	Ford	Econoline E250	Commercial Van	20%	Vehicle AC	unknown	unknown	unknown	3.3	HFC-134a	0.00003	0.43			
Total HFC Emissions from Vehicle Air Conditioning													2.15	tCO2e		
Data Sources:																
Utilities 2018.xls.																
Facility refrigerant charge quantities tracked by facilities department																
Vehicle refrigerant estimates calculated using screening method identified in The Climate Registry General Reporting Protocol, v2.1, Chapter 16																
Upper bound charge capacity and upper bound loss rates for mobile air conditioning taken from Table 4.1 of TCR's Default Emission Factor Document, May 2019																
HCN and APEI Baltimore do not maintain any vehicles																





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Scope 2: Electricity Emissions: Location-Based					Totals:	tCO2e											
					APUS	2,566.87											
					HCN	1,316.73											
					APEI	17.28											
					Total	3,900.88	tCO2e										
Organization	Facility Name	Facility Address	Building Identifier	State	Zip	Square Footage	Actual (A) or Estimated (E) consumption	Energy Use (kWh)	EPA eGRID Subregion	CO ₂ (metric tons)	CH ₄ (metric tons)	N ₂ O (metric tons)	tCO ₂ e (metric tons CO ₂ e)	Comments			
APUS	HR	111 West Congress Street	111	WV	25414	10,432	A	177,040	RFCW	93.6423	0.0094	0.0014	94.28				
CDU	Leased to CDU	115 West Congress Street	115	WV	25414	3,500	A	0	RFCW	0.0000	0.0000	0.0000	0.00	Not Operated by APEI			
APUS	Overnight Guests	200 South George Street	200	WV	25414	3,100	A	35,358	RFCW	18.7020	0.0019	0.0003	18.83				
APUS	Guests and Conference Rooms	203 South George Street	203	WV	25414	3,000	A	18,495	RFCW	9.7826	0.0010	0.0001	9.85				
APUS	Overnight Guests	208 South George Street	208	WV	25414	4,844	A	35,138	RFCW	18.5856	0.0019	0.0003	18.71				
APUS	Security/Overnight guests	216 South George Street	216	WV	25414	5,400	A	99,075	RFCW	52.4040	0.0053	0.0008	52.76				
APUS	Facilities	219 South Charles Street	219	WV	25414	1,600	A	46,169	RFCW	24.4203	0.0025	0.0004	24.59				
APUS	TBD	300 South George Street	300	WV	25414	4,400	A	48,840	RFCW	25.8331	0.0026	0.0004	26.01				
APUS	IT	303 West third Avenue Ranson	303	WV	25414	38,200	A	1,120,268	RFCW	592.5466	0.0595	0.0086	596.61				
APUS	Academics	330 North George Street	330	WV	25414	45,000	A	464,304	RFCW	245.5857	0.0246	0.0036	247.27				
APUS	Academics	330 North George Street	330 Building Solar Array (22 kW)	WV	25414	n/a	A	89,000	RFCW	47.0750	0.0047	0.0007	47.40	Source: Total RECs sold in 2018 (453 MWh), minus generation at Bldg 393			
APUS	Academics	330 North George Street	330 (fire pump/generator)	WV	25414	n/a	A	248	RFCW	0.1312	0.0000	0.0000	0.13				
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393	WV	25414	105,000	A	1,176,968	RFCW	622.5371	0.0625	0.0091	626.80				
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393 Building Solar Array (375 kW)	WV	25414	n/a	A	364,000	RFCW	192.5316	0.0193	0.0028	193.85	Source: Solar production tab of Utilities 2018.xls 364,059 kWh, 364 RECs sold			
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393 (generator)	WV	25414	n/a	A	520	RFCW	0.2750	0.0000	0.0000	0.28				
APUS	Facilities Storage	406 South Buchanan Ranson	406	WV	25414	6,300	A	25,902	RFCW	13.7004	0.0014	0.0002	13.79				
APUS	Marketing/Student Services	10110 Battlevue Parkway 114	Manassas	VA	20109	24,986	E	1,756,477	SRVC	592.2284	0.0534	0.0072	595.70	Actual data for Jan-August. Estimated for remainder of year using actual data for first half of year			
APEI	Executive offices	Quarry Lake	Baltimore	MD	21209	2,500	E	52,926	RFCE	17.1882	0.0015	0.0002	17.28	Estimated using CBCECS 2012 Energy Intensity factor for office space			
HCN	Columbus	4140 Executive Parkway	Westerville	OH	43081	24,970	E	548,438	RFCW	290.0868	0.0291	0.0042	292.07				
HCN	Cincinnati	7600 Tylers Pl. Blvd	West Chester	OH	45069	24,970	E	548,438	RFCW	290.0868	0.0291	0.0042	292.07				
HCN	Cleveland	5005 Rockside Rd. Suite 130	Independence	OH	44131	22,120	E	278,712	RFCW	147.4199	0.0148	0.0021	148.43				
HCN	Dayton	1810 Successful Dr.	Fairborn	OH	45324	24,970	E	548,438	RFCW	290.0868	0.0291	0.0042	292.07				
HCN	Toledo	1684 Woodlands Drive	Maumee	OH	43537	24,970	E	548,438	RFCW	290.0868	0.0291	0.0042	292.07				
Total													Total Emissions	3,900.88			





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Scope 2: Electricity Emissions: Market-Based																		
Totals:																		
															1,941.27			
															850.29			
															18.20			
															2,809.76	tCO2e		
Organization	Facility Name	Facility Address	Building Number	State	Zip	Square Footage	Actual (A) or Estimated (E) consumption	Energy Use (kWh)	Purchased/Sold RECs or other Contractual Instruments (converted to kWh)	EPA eGRID Subregion	Green-e Subregion	Electricity Source	CO ₂ (metric tons)	CH ₄ (metric tons)	N ₂ O (metric tons)	tCO ₂ e (metric tons CO ₂ e)	Comments	
APUS	HR	111 West Congress Street	111	WV	25414	10,432	A	177,040	0	RFCW	RFC	grid	60.88	0	0	60.88		
CDU	Leased to CDU	115 West Congress Street	115	WV	25414	3,500	A	0	0	RFCW	RFC	grid	0.00	0	0	0.00	Not Operated by APEI	
APUS	Overnight Guests	200 South George Street	200	WV	25414	3,100	A	35,358	0	RFCW	RFC	grid	12.16	0	0	12.16		
APUS	Guests and Conference Rooms	203 South George Street	203	WV	25414	3,000	A	18,495	0	RFCW	RFC	grid	6.36	0	0	6.36		
APUS	Overnight Guests	208 South George Street	208	WV	25414	4,844	A	35,138	0	RFCW	RFC	grid	12.08	0	0	12.08		
APUS	Security/Overnight guests	216 South George Street	216	WV	25414	5,400	A	99,075	0	RFCW	RFC	grid	34.07	0	0	34.07		
APUS	Facilities	219 South Charles Street	219	WV	25414	1,600	A	46,169	0	RFCW	RFC	grid	15.88	0	0	15.88		
APUS	TBD	300 South George Street	300	WV	25414	4,400	A	48,840	0	RFCW	RFC	grid	16.80	0	0	16.80		
APUS	IT	303 West third Avenue Ranson	303	WV	25414	38,200	A	1,120,268	0	RFCW	RFC	grid	385.27	0	0	385.27		
APUS	Academics	330 North George Street	330	WV	25414	45,000	A	464,304	0	RFCW	RFC	grid	159.68	0	0	159.68	Confirm this is a reasonable amount to generate from this size system	
APUS	Academics	330 North George Street	330 Building Solar Array (22 kW)	WV	25414	45,000	A	0	-89,000	RFCW	RFC	solar	30.61	0	0	30.61	Calculated from SRECs sold (453 RECs sold in 2018)	
APUS	Academics	330 North George Street	330 (fire pump/generator)	WV	25414	38,200	A	248	0	RFCW	RFC	grid	0.09	0	0	0.09		
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393	WV	25414	105,000	A	1,176,968	0	RFCW	RFC	grid	404.77	0	0	404.77		
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393 (generator)	WV	25414	105,000	A	520	0	RFCW	RFC	grid	0.18	0	0	0.18		
APUS	Finance/Admissions/Facilities	393 N. Lawrence Street	393 Building Solar Array (375 kW)	WV	25414	105,000	A	0	-364,000	RFCW	RFC	solar	125.18	0	0	125.18	Source: Solar production tab of Utilities 2018.xls 364,059 kWh, 364 RECs sold	
APUS	Facilities Storage	406 South Buchanan Ranson	406	WV	25414	6,300	A	25,902	0	RFCW	RFC	grid	8.91	0	0	8.91		
APUS	Marketing/Student Services	10110 Battleview Parkway 114		Manassas	VA	20109	24,986	E	1,756,477	0	SRVC	SERC	grid	668.37	0	0	668.37	Actual data for Jan-August. Estimated for remainder of year using actual data for first half of year
APEI	Executive offices	Quarry Lake		Baltimore	MD	21209	2,500	E	52,926	0	RFCE	RFC	grid	18.20	0	0	18.20	Estimated using CBCECS 2012 Energy Intensity factor for office space
HCN	Columbus	4140 Executive Parkway, Westerville		Westerville	OH	43081	24,970	E	548,438	0	RFCW	RFC	grid	188.61	0	0	188.61	
HCN	Cincinnati	7600 Tylers Pl Blvd, West Chester		West Chester	OH	45069	24,970	E	548,438	0	RFCW	RFC	grid	188.61	0	0	188.61	
HCN	Cleveland	7600 Mackay Rd, Westerville		Independence	OH	44131	22,120	E	278,712	0	RFCW	RFC	grid	95.85	0	0	95.85	
HCN	Dayton	1810 Successful Dr, Fairborn		Fairborn	OH	45324	24,970	E	548,438	0	RFCW	RFC	grid	188.61	0	0	188.61	
HCN	Toledo	1684 Woodlands Drive, Maumee		Maumee	OH	43537	24,970	E	548,438	0	RFCW	RFC	grid	188.61	0	0	188.61	
Total															Total Emissions		2,809.76	
Data Source: kWh consumption reports provided by Potomac Edison																		
Notes:																		
Utility emission factor for Dominion Energy is unverified, and therefore not used in GHG Calculations.																		
Green-e, "Green-e Energy Residual Mix Emissions Rates (2018)," April 27, 2018 (https://www.green-e.org/docs/energy/Residual%20Mix%202018.pdf).																		
Generation data was not available for the Solar Array at 330 N. George Street, so it was calculated from REC sales (RECs were sold for all solar power generated).																		
RECs sold are identified as negative values and have been converted to kWh for calculation purposes. RECs are sold in MWh (1 REC = 1 MWh).																		
Green-E does not publish emission factors for CH4 and N2O. Standard practice to not report these emissions when using Green-E																		
For HCN facility estimates, building heating was included by converting heating values from natural gas use into kWh																		



Scope 3: Employee Commuting				Totals:	tCO2e			
				APUS	1,443.40			
				HCN	371.30			
				APEI	3.35			
				Total	1,818.05	tCO2e		
Employee Commuter Survey Results:								
Organization	What mode of transportation do you typically utilize?	Annual Commute Totals (miles)	Number of Employees	CO2 (metric ton GHG)	CH4 (metric ton GHG)	N2O (metric ton GHG)	CO2e (metric tons)	
APUS	Passenger Car: includes passenger cars, minivans, SUV's, and small pickup trucks	4,071,833	550	1,364.064	0.037	0.033	1,374.69	
APUS	Light-Duty Truck: includes full-size pick-up trucks, full-size vans, and extended-length SUV's	148,006	16	68.231	0.002	0.001	68.72	
APUS	Motorcycle	0	0	n/a	n/a	n/a	n/a	
APUS	Walk	0	0	n/a	n/a	n/a	n/a	
APUS	Bicycle	0	0	n/a	n/a	n/a	n/a	
APUS	Bus	0	0	n/a	n/a	n/a	n/a	
APUS	Carpool	0	42	n/a	n/a	n/a	n/a	
APUS Total		4,219,839	608				1,443.40	(surveyed)
							863	Employees Surveyed
Estimates based on surveyed data:							1.67	tCO2e/employee
Organization	Location		Number of Employees not covered in survey	CO2 (metric ton GHG)	CH4 (metric ton GHG)	N2O (metric ton GHG)	CO2e (metric tons)	
HCN	Hondros College of Nursing		222				371.30	tCO2e
APEI	APEI Baltimore Office		2				3.35	tCO2e
							376.32	(estimated)
Notes:								
Data Source: EE Commute Survey Report 12.19.2019 - Sundowner Report								
Distance-based method								
863 Surveys completed								
Assumed 248 working days per year (261 average work days - 13 PTO days)								
Survey data includes APUS employees only								



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Scope 3 Business Travel - Air and Rail Miles				Emission Calculations			
Miles:				Air		Rail	
Short Haul	915	Air Travel - Short Haul (< 300 miles)		CO2	271.93 metric tons	0.83	metric tons
Medium Haul	628,899	Air Travel - Medium Haul (>= 300 miles, < 2300 miles)		CH4	0.00 metric tons	0.00007	metric tons
Long Haul	1,139,908	Air Travel - Long Haul (>= 2300 miles)		N2O	0.01 metric tons	0.00002	metric tons
				tCO2e	274.51 metric tons	0.84	metric tons
Rail Travel	7,384	Intercity Rail (i.e. Amtrak) ^c					

Notes:
 All air and rail business travel reported under APEI, as data does not provide breakdown between APUS, HCN and APEI.
 Segment Itinerary WAS BAL was changed from long haul air (9,414 miles identified in the trip_miles column) to rail. WAS is not an airport and BAL is Batman Airport, Turkey. Actual route is Washington to Baltimore. Data was removed from grey cells and replaced with Direct Travel, XXX ZZZ charges are for paid seats for travelers. Miles were removed for each XXX ZZZ itinerary, as each had a corresponding entry with a round trip flights from TPA to DCA. Removals were highlighted in grey

Data Source:
 APUS Air Travel 2018

Scope 3 Business Travel - Vehicle Miles				Emission Calculations			
Data Provided		Mileage Estimates		APEI Mileage		APUS Mileage	
January	46	436	January	3,119	18,356	Total Miles	37,296
February	2,984	3,449	February	3,119	18,356	Total CO2	12.4942
March	4,432	17,197	March	4,432	17,197	Total CH4	0.0003
April	5,446	16,084	April	5,446	16,084	Total N2O	0.0003
May	7,109	29,100	May	7,109	29,100	Total CO2e (metric tons)	12.59
June	1,925	14,204	June	1,925	14,204		74.37
July	1,141	14,983	July	1,141	14,983		
August	2,024	13,012	August	2,024	13,012		
September	1,596	25,635	September	1,596	25,635		
October	3,108	21,254	October	3,108	21,254		
November	1,293	13,736	November	1,293	13,736		
December	0	745	December	2,984	18,356		
Total Miles	31,104	169,834	Total Miles	37,296	220,273		
		200,937			257,569		

Notes:
 File source: Mileage Mar through Nov 2019.xls provided by Jeff Bostian, Assistant Controller
 2018 Mileage data not available. 2019 data used as proxy
 HCN Data is included under APEI

Scope 3 Business Travel - Car rentals and Taxi's			Emission Calculations	
Mileage Estimate Calculations				
Car Rental	\$5,218.90	9,575.96	Total Miles	115,967.36
Taxi	\$48,926.85	89,774.04	Total CO2	38.85
Fuel	\$8,972.46	16,463.23	Total CH4	0.001
Mileage	\$84.00	154.13	Total N2O	0.001
	\$ 63,202.21	115,967.36	Total CO2e (metric tons)	39.15

Notes:
 File source: "Car rental-Uber-Taxi.xls"
 2018 data not available. 2019 data used as proxy (including 3 entries from 2018)
 Reported under APEI



			Totals:	tCO2e				
Scope 3: Waste Disposal Emissions			APUS	37.35				
			HCN	20.48				
			APEI	0.20				
			Total	58.03 tCO2e				
Organization	Pickup Location	Actual or Estimate	Employee Count	lbs./day*	lbs/year	short tons	tCO2e	Comments
APUS	330 N George St	A	n/a	n/a	n/a	31.18	11.22	Data supplied by Republic Services Rep; 330 N. George and 393 N. Lawrence share the same dumpsters.
APUS	111 W. Congress	A	n/a	n/a	n/a	15.59	5.61	Data supplied by Republic Services Rep
APUS	303 W. 3rd St	A	n/a	n/a	n/a	31.18	11.22	Data supplied by Republic Services Rep. Requested confirmation of values.
APUS	Manassas	E	95	208	51,596	25.80	9.29	
APEI	Baltimore	E	2.00	4	1,086	0.54	0.20	
HCN	Columbus	E	41.9	92	22,757	11.38	4.10	
HCN	Cincinnati	E	41.9	92	22,757	11.38	4.10	
HCN	Cleveland	E	41.9	92	22,757	11.38	4.10	
HCN	Dayton	E	41.9	92	22,757	11.38	4.10	
HCN	Toledo	E	41.9	92	22,757	11.38	4.10	
Total						161.18	58.03	*corrected (added lbs/year column)
Data Sources:								
https://archive.epa.gov/epawaste/nonhaz/municipal/web/pdf/2012_msw_fs.pdf								
https://archive.epa.gov/epawaste/nonhaz/municipal/web/html/								
Notes:								
4.38 lbs. MWS generated per person per day								
MSW emissions value consistent with WARM v15 Model (small difference to do rounding of emission factor)								
Assumed 248 working days per year (261 average work days - 13 PTO days)								
For HCN, using calculated Full-Time Equivalent to account for 25 part-time workers (assume half-day)								
For lbs./day, assume 8 hours of 16 waking hours per day (50% of day) spent at work								
Per WRI Category 5: Waste Generated in Operations, "Any claims of avoided emissions associated with recycling should not be included in, or deducted from, the scope 3 inventory, but may instead be reported separately from scope 1, scope 2, and scope 3 emissions"								