

University for the Common Good

Carbon Footprint Report for 2020-21

Executive Summary

Glasgow Caledonian University (GCU/the University) reports its greenhouse gas (GHG) emissions annually, with reports used to improve performance and meet compliance obligations.

The present report covers emissions for the 2020-21 academic year, where in response to restrictions introduced to control the pandemic, University operations were remote. As a result, compared to the University's baseline (2014-15) the present reporting period is considered exceptional. The report outlines how key changes to GCU's operating model have impacted GHG emissions.

The overall reporting approach is unchanged, with the University following the GHG Protocol Standards and adhering to the principles of: accuracy, completeness, consistency, relevance and transparency. The reporting boundaries (operational control) and methodology for the 2020-21 GHG emissions inventory remain the same, although a number of assumptions about data were made and, in line with Scottish Government guidance, emissions for working from home have been made.

In 2020-21 GCU's GHG emissions inventory was 16,923 tonnes CO₂e, 50% lower than in 2018-19 (the last full pre-pandemic inventory) and 75% lower than the 2014-15 baseline. Reductions were particularly noticeable in emissions from electricity and travel (which all but ceased during the reporting period).



Whilst the 2020-21 inventory reflects the full impact of the pandemic on the University's operations, as on-campus activity gradually resumes, its emissions are anticipated to rebound (especially travel), but to a level closer to those of the 2018-19 inventory.

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Introduction

Glasgow Caledonian University (GCU/the University) reports its greenhouse gas emissions (GHG) annually and through its Environmental Management System uses them to benchmark performance, target improvements and assess progress towards environmental commitments and meet compliance obligations.

During the 2020-21 reporting period, and in response to restrictions introduced to control the coronavirus pandemic, the University operated predominantly remotely. From a GHG perspective, this represents significant deviation from the University's traditional operating model and 2020-21 is considered to be exceptional.

This report outlines the key changes to GCU's operational model and how they have impacted GHG emissions from the University.

Data & Methodology

GCU reports its GHG emissions according to the GHG Protocol Standards¹ and adheres to the reporting principles of: accuracy, completeness, consistency, relevance and transparency. The reporting boundaries (operational control) and methodology for the 2020-21 GHG emissions inventory are the same as those used in previous reporting periods.

Whilst the general approach and datasets have not changed (Table 1), the 2020-21 inventory includes a requirement from the Scottish Government to report emissions for staff working from home and for which the recommended methodology² was used (0.3 tCO₂e per FTE working from home).

In addition to the above, the following assumptions were made regarding various aspects of the University's operations:

- It was assumed that students were home based (non-term address) and that there were no emissions from students travelling home. Whilst it is likely that some students will have travelled to our campus, the predominantly remote nature of the University operations during 2020-21 would suggest that this was the exception rather than the rule.
- Emissions from student commuting were estimated using attendance records and the 2018 Travel Survey modal distribution. It is noted that whilst this may not reflect actual travel choices, given the scale of emissions it is a good enough estimate. Attendance records suggest that on a typical term week, 616 students attended campus once a week.
- No business travel took place. Whilst this is not the case, as there was some expenses data for local rail travel, the emissions would have been negligible and have not been included.
- No waste was produced in GCU London. Although it is noted that this is unlikely to be the case, as normal arisings are comparatively small it was assumed that with a predominantly remote operating model very little waste will have arisen.
- A similar assumption was made for sanitary waste from the campus in Glasgow.
- Waste arisings for Caledonian Court were estimated by proportioning historic data with known occupancy rates.
- For staff commuting it was assumed that around 50 individuals were on campus throughout the reporting period and that they drove to campus. Everyone else were working remotely.

¹ Greenhouse Gas Protocol – <u>Corporate Standard</u> and <u>Corporate Value Chain (Scope 3) Standard</u>.

² <u>Public Bodies Climate Change Reporting 2020/21 page 10/28</u> (accessed 26 November 2021).

• Responsibility for reporting emissions from the Test Centre operating from the Arc Sports Centre would be with NHS Scotland. Therefore, GCU's 2020-21 Report excludes gas and electricity data from the Arc Sports Centre.

It is also noted that although the data and calculations in this report were not subject to independent verification or quality assurance, they benefited from a peer review exercise with the University of Strathclyde (in collaboration with the Environmental Association of Universities & Colleges – Scotland).

Emission	Scop	Emission Activity	Typical data quality observations		
Category	е				
Organisation's buildings	1	Gas consumption	High quality data derived from gas meter readings.		
Organisation's	1	Refrigerant Gases	High quality data derived from contractor`s		
buildings			measurements of systems' fluorinated gas charge.		
Organisation's	1	Business travel (own	High quality data derived from fuel card reports.		
vehicles		fleet)			
Purchased	2	Electricity (Nat. Grid)	High quality data derived from electricity meter		
electricity		Total	readings.		
Purchased	3	Water	High quality data derived from water meter		
Goods &			readings.		
Services					
Purchased	3	Procurement - HEPA	Low-medium quality data. Derived from spend		
Goods &		tool (formerly	data.		
Services	2	HESCEI tool)			
Other fuel &	3	Electricity	High quality data derived from electricity meter		
energy rei.		(transmission &	readings.		
Wasto	2	General Waste &	Modium high Data for Clasgow dorived from		
Generated in	5	recycling	contractors' weighing systems. C. Court and GCU		
Operations		recycling	London data based on historic estimates		
Waste	3	Wastewater	High quality data derived from water meter		
Generated in	5	Wastewater	readings. Assumed 95% of purchased water		
Operations			becomes wastewater.		
Business	3	Travel (business –	High quality data derived from supplier records.		
travel		not owned)			
Employee	3	Travel (commuting –	Low quality data derived from estimates of the		
commuting		staff)	number of staff on-campus and observations about		
			how they travelled during the pandemic.		
Employee	3	Working from home	Medium quality data derived from Scottish		
commuting		(staff)	Government intensity factor for FTE.		
Employee	3	Travel (commuting –	Low quality data derived from estimates of the		
commuting		students)	number of students on-campus and an assumption		
			that modes of travel were the same as those		
			reported in the 2018 Travel Survey.		
Employee	3	UK domiciled	Low quality data based on the assumption that		
commuting		students – travel	there was no need for travel because the majority		
Franks, s.	2	nome.	of students worked from home.		
Employee	3	international	Low quality data based on the assumption that		
commuting		students – travel	there was no need for travel because the majority		
		nome.	of students worked from nome.		

Table 1. Observations on data quality for the University's emissions inventory.

Inventory & Emissions

In 2020-21 GCU's GHG emissions inventory was 16,923 tonnes CO₂e, which was 50% lower than in 2018-19 (the last full pre-pandemic inventory) and 57% lower than the 2014-15 baseline. A summary of GCU's current and historic GHG inventories is provided in Figure 1 and summarised in Table 2. A breakdown is also provided by activity and thematic grouping (Figure 3), with a summary of key changes provided in the next section.

Whilst emissions had been on a downward trajectory after peaking in 2015-16, the onset of the pandemic in 2019-20 is associated with a dramatic reduction (particularly in scope 3 emissions) due to the curtailment of on-campus activity (Figure 1 and Table 2). The curtailment of on-campus activity has resulted in emissions for 2020-21 being less than half of the emissions in 2014-15, the University's GHG inventory baseline. It is anticipated that this reduction will not be permanent and that once activity recovers to pre-pandemic levels, emissions will return to around 2018-19 and 2019-20 levels.



Figure 1. Emissions (tonnes CO₂e) at GCU by scopes in 2014-15.

Scope	Description	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
1	Direct combustion of fuels and other fugitive emissions.	4,598	4,794	4,745	4,589	4,974	5,136	4,979
2	Electricity from the National Grid.	2,784	2,902	2,613	1,881	1,576	998	658
3	Other up- and downstream activities outwith GCU's operational control.	32,232	34,509	28,200	30,625	27,503	22,415	11,286
Total		39,615	42,205	35,557	37,095	34,053	28,549	16,923

Table 2. Emissions (tonnes CO₂e) by scopes.

Although there were emission reductions across all scopes, these were more pronounced in Scopes 2 & 3 (Table 2) and in particular around purchased electricity and travel activity (Figure 2).



Figure 2. GCU's GHG emissions by activity category for 2020-21 and 2014-15 (the baseline), 2018-19 (the last pre-pandemic year) and 2019-20 (the onset of the pandemic).

Emissions are typically reported in scopes, but to help contextualise around particular activities, GCU also aggregates emissions into four thematic groups: energy, supply chain, travel and other. Energy, supply chain and travel represent 99% of reported emissions. Whilst the pandemic has impacted activity levels across all the University, it has almost eliminated emissions from travel (Figure 3), which are about 3.5% of pre-pandemic levels. The following section evaluates the data underlying these emissions to explore the permanence of these changes.



Figure 3. GHG emissions by thematic group, with energy, supply chain and travel dominating inventories. In addition to 2020-21, 2014-15 is included because it is the baseline, 2018-19 is the last 'normal' operating year and 2019-20 represents the onset of the pandemic.

Trends & Observations

The 2020-21 GHG inventory reflects the operation of the University in the midst of the covid pandemic and during a number of national lockdowns. With a focus on remote working, travel to campus and on-behalf of the University is virtually non-existent, energy consumption reduces and purchasing (supply chain emissions) is redirected to support the remote working model.

Travel

During 2020-21 the University adopted a predominantly remote working model and as a result there was no significant business travel, student and staff commuting or student travel home because it was assumed most students were home based (Figure 4). In line with the guidance from the Scottish Government, emissions from staff working were included.

For this reporting period, travel activity at the University emitted 504 tCO₂e, most (80%) attributed to staff working from home. Travel emissions in 2020-21 were 3.5% of pre-pandemic travel emissions (2018-19).





Whilst the remote operating model adopted during 2021-2 meant that there was no significant travel to, from and on-behalf of the University, it is anticipated that as operations move to a hybrid model, emissions in this category will rebound.

The extent of that rebound is unclear, but it is anticipated to be somewhere between 2018-19 and 2019-20 levels thanks to the adoption of hybrid working and a new business travel policy. Hybrid working is likely to reduce the frequency that student and staff commute to the University and will impact emissions from student and staff commuting. Hybrid working, coupled with the new business travel policy, will impact emissions from business travel by reducing demand for travel through online meetings and less flying.

Supply Chain

In 2020-21 11,092 tCO₂e were attributed to the University's supply chain, representing 63% of all reported emissions. Emissions are comparable with previous years, although the proportion is significantly higher (in 2018-19 supply chain emissions were 38% of total reported emissions).

The main category (by Proc HE category³) is software supplies which accounted for 49% of all supply chain emissions (Table 3), with the top 10 Proc HE categories representing 73% of supply chain emissions. There has been little change in the order of the Proc HE sectors with the highest emissions at GCU.

Proc HE cat. description	tCO2e	No. Suppliers	Percentage of supply chain emissions	Rank
IT Software including Bespoke	5,303	50	49%	1
Licences Maintenance				
Desktop, Laptop, Tablet Purchase	610	5	6%	2

³ Proc HE is a national Commodity Coding convention used by the HE Sector and Local Authorities.

Laboratory Capital Equipment	392	18	4%	3
Other/General Computer Supplies	331	32	3%	4
and services				
Building Related Professional	270	11	2%	5
Services				
Server and Networking Equipment	218	6	2%	6
Installation and Maintenance				
Medical, Small Apparatus,	193	24	2%	7
Equipment and Instruments				
Catering Services Outsourced at a	192	1	2%	8
fixed site				
Data Information Services	190	16	2%	9
Temporary & Recruitment	167	19	2%	10
Employment Agencies (Staff)				

 Table 3. Top 10 Proc HE categories for GHG emissions (tCO2e) in GCU's supply chain in 2020-21.

Supply chain emissions are derived from spend with 760 suppliers, and although commercial confidentiality prevents the disclosure of emissions from specific suppliers, the top 10 suppliers (by GHG emissions) were responsible for nearly 50% of all supply chain emissions (Table 4). Many of the top 10 suppliers ranked in previous inventories' top 10.

Supplier (Rank)	tCO₂e	Percentage of supply chain emissions			
1	1,722	16.06%			
2	1,365	12.73%			
3	515	4.81%			
4	376	3.51%			
5	255	2.37%			
6	233	2.17%			
7	223	2.08%			
8	213	1.99%			
9	192	1.79%			
10	171	1.60%			

Table 4. Top 10 suppliers for GHG emission (tCO_2e) in GCU's supply chain in 2020-21.

Whilst the methodology for estimating supply chain emissions is not sufficiently sensitive to reflect our own individual procurement decisions, it helps to identify hot spots to focus on and suppliers to engage to understand how they can support the University's climate commitments.

Energy

In 2020-21 the University emitted 5,532 tCO₂e (33% of all reported emissions), which was 17% lower than in 2018-19. 87% of emissions were attributed to gas, 12% to purchased electricity and the remainder (1%) to transmission and distribution loses of purchased electricity.

Emissions from gas are comparable to pre-pandemic levels, but fell significantly for electricity and by association also transmission and distribution losses (Figure 5).



Figure 5. GHG emissions for energy use at GCU.

The decrease in emissions from electricity is attributed to the decarbonisation of the National Grid and due to reduced activity on-campus, a reduction in the amount of purchased electricity from the grid (Table 5). Modest energy savings upgrades and the exclusion of energy used to power the Arc Sports Centre whilst it was operated as a Covid-19 Test Centre for the NHS will have also contributed to the reduction in energy emissions.

Parameter	2018-19	2019-20	2020-21
Electricity - N. Grid (kWh)	5,311,279	3,409,962	3,100,016
Electricity - Energy Centre (kWh)	4,426,410	4,636,080	4,542,363
Electricity - Total (kWh)	9,737,689	8,046,042	7,642,379
% of total electricity (kWh) from Energy Centre	45%	58%	59%
% change in total kWh (relative to 2018-19)		-17%	-22%
Emission factor (kg CO ₂ .kWh electricity N. Grid)	0.25358	0.23314	0.21233
% change in emission factor (relative to 2018-19)		-8%	-16%

Table 5. A reduction in the amount of electricity used on campus and the decarbonisation of the N. Grid resulted in the reduction of emissions from energy consumption at the University.

As on-campus activity increases, so will demand for electricity and it is anticipated that emissions from energy, primarily from the increased demand for grid electricity, will rebound close to 2018-19 levels.

Other

Emissions from other activity, which includes waste, water, wastewater and refrigerated gases were 166 tCO₂e. In this group, there were reductions in emissions from waste and recycling, water and waste water, which are linked to on-campus activity. Emissions from refrigerants (used in the University's cooling systems) increased, but they are independent of on-campus activity and linked to equipment operational condition.

Although emissions in this group are anticipated to increase with more on-campus activity, the refresh of the University's waste minimisation and recycling plan, as well as the introduction of a water saving plan, will help ensure that they do not become a significant source of emissions.

Closing Remarks

The 2020-21 inventory reflects the full impact of the pandemic on University operations, with particular impact on all types of travel. Whilst the University adapted its operating model by introducing new ways of working, as on-campus activity resumes it is likely that emissions will rebound (especially from travel), although it is expected to a level lower than 2018-19.

Version Control

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