Water Efficiency Plan (2023)

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Introduction

"Water is vital for life. Clean freshwater is necessary for drinking and sanitation, providing for our crops, livestock and industry, and creating and sustaining the ecosystems on which all life depends. However, readily accessible freshwater – which is found in rivers, lakes, wetlands and aquifers – accounts for less than one per cent of the world's water.

As the global human population grows, so too do the demands for water. At the same time, human activity and climate change are disrupting natural water cycles, putting freshwater ecosystems under pressure. Poor water management, pollution, infrastructure development and resource extraction further exacerbate the negative impacts on our freshwater systems." (UNEP[1])

Glasgow Caledonian University (GCU) recognises the importance of water and is committed to ensuring that water use on its Estate contributes to good water and environmental stewardship. The University is also committed to furthering the Sustainable Development Goals (SDG) and become carbon neutral by 2040.

Strategy 2030 sets out the GCU's vision as the University for the Common Good for the next decade and uses the SDG as a framework for achieving its ambition across six strategic themes (Figure 1). The commitment to reduce water use across its Estates sits within the sixth theme: Engaged University Community committed to the Common Good.

GCU's Water Efficiency Plan (WEP) sets out how the University will deliver on these commitments by ensuring that appropriate controls and checks are in place to reduce consumption and the risk of water pollution.

Figure 1 Strategy 2030 vision and ambition.

The WEP help the University will contribute to the following SDG (with Appendix A outlining the contribution to associated targets and indicators):

[1] UNEP (Accessed: 3/2/2023)

- 6 Clean Water and Sanitation
- 7 Affordable and Clean Energy
- 13 Climate Action

This Plan highlights how the University will improve its understanding of where and how water is used as well as the type of measures it will implement to reduce consumption.

Vision for 2030

In 2030, we will have a very detailed understanding of where and how we consume water across all aspects of our operations. Through our environmental management system the risk of water pollution from our operations will be minimal. Rainwater harvesting and grey-water recycling will be a feature of new buildings in our Estate. Our commitment and investment in water efficiency, rainwater harvesting and grey-water recycling will ensure that GCU remains amongst the most water efficient universities in the UK. Rainfall attenuation measures across our Estate will contribute to wider climate adaptation efforts in Glasgow.

Aims & Objectives

The aim of this WEP is reduce water consumption at GCU to below 2,000 litres per student and staff full time equivalent (FTE) and 300 litres per m^2 Gross Internal Area (GIA) by 2029-30. For scope 3 greenhouse gas emissions (GHG) associated with water supply, the aim is for the total emissions to be less than 2 tonnes CO_2e. To achieve this, the University will:

- Establish and review controls to minimise the risk of water pollution from our operations.
- Develop a water monitoring strategy and systems that enables the University to understand where and how water is used across its operations.
- Work with internal and external stakeholders to identify, adopt and share good practice.
- Identify and develop opportunities for reducing water consumption across its Estate.
- Develop key criteria for saving water in new builds and refurbishment projects.
- Identify how rainwater management interventions can contribute to climate adaptation in the University's Estate and the City.

For convenience, interventions are categorized as: insights and monitoring; efficiency, adaptation and planning.

Scope

The scope of the WEP all aspects of GCU's operations that the University has direct operational control. Premises rented by the University are currently not within scope of the WEP, but will be incorporated as opportunities arise/are explored.

Water Use at GCU

Detailed data on water consumption is only available for the Campus in Glasgow, where use is metered at the supply point.

At GCU, water is used for personal hygiene, cleaning, catering and in support of research activity. In 2018-19, GCU used 39,101m^3 in its Campus (the equivalent of 2,670 litres per student and staff full time equivalent (FTE) or 460 litres per square metre gross internal area (GIA)). In the same year, total GHG emissions reported for water were 13.45 t CO_2e using the UK emission factor for water supply. If the Scottish emission factor was used (as was adopted by the University from 2019-20), then total GHG emissions for water would have been 4.30 tCO_2e.

Historic data shows a downward trajectory in total water use (Figure 2), driven by a number a number of water saving measures, that include a more tailored window-cleaning regime, new urinal

controls across the campus and partial installation of more water efficient taps.

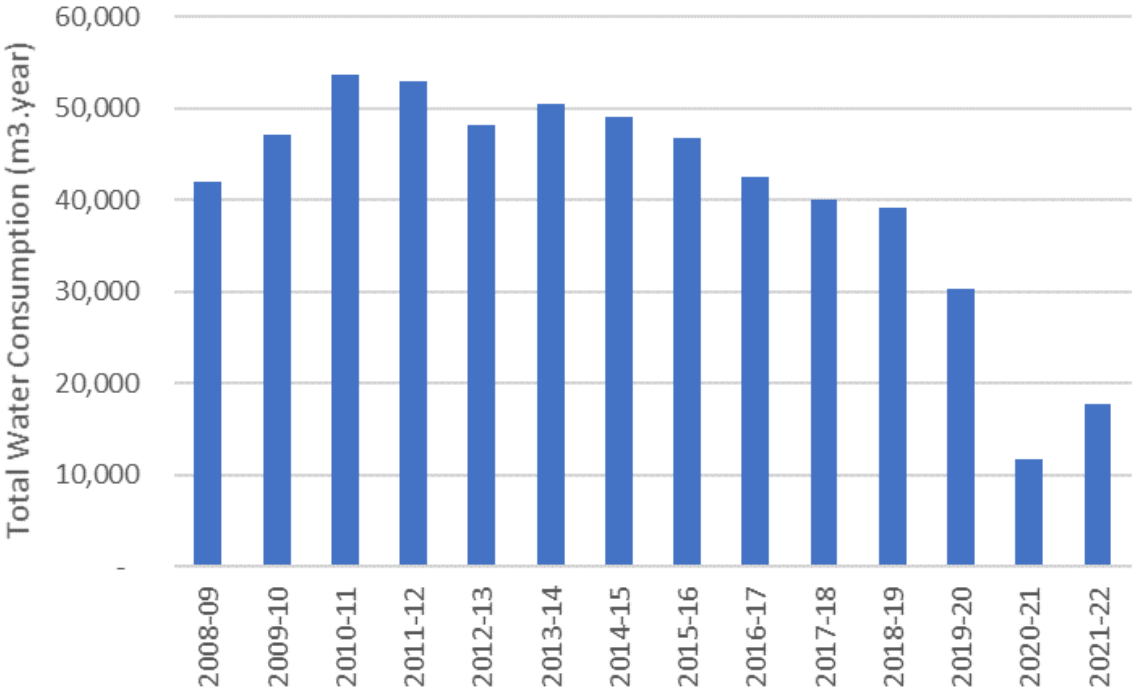

Figure 2 Annual water consumption (m^3) at GCU's Campus in Glasgow. The decline between 2019-20 and 2021-22 is attributed to the Corona Virus Pandemic.

In 2018-19, the last full, pre-pandemic year 39,101m^3 of water was used in the University's Campus. This is equivalent to 2,670 litres per year per student and staff full time equivalent (FTE) or 460 litres per square metre gross internal area (GIA). Consumption in the subsequent years data is available for is lower, but influenced by the reduced activity on campus during the Coronavirus pandemic.

The above normalised factors (litres.FTE and litres.m^2) place GCU amongst the most water efficient universities in the UK (Figure 3 and Figure 4). However, it is worthwhile noting that an extensive range of factors influence water consumption (e.g. nature of the university operation and age of the estate) and comparisons based on FTE and GIA alone are of limited use (but provided for context).

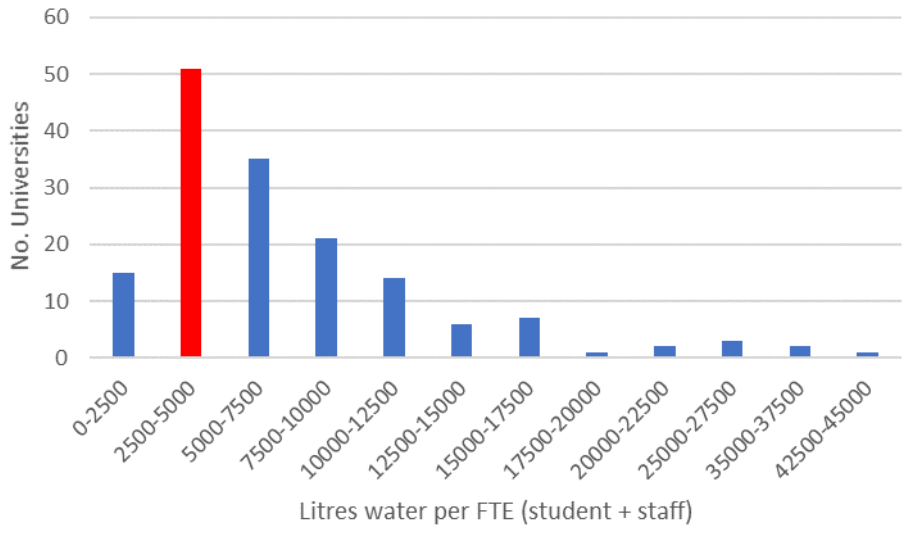

Figure 3 Water use (litres.FTE) in 2018-19 for universities in the UK. GCU is in the red consumption band (second from the left). Data is from HESA EMR 2018-19.

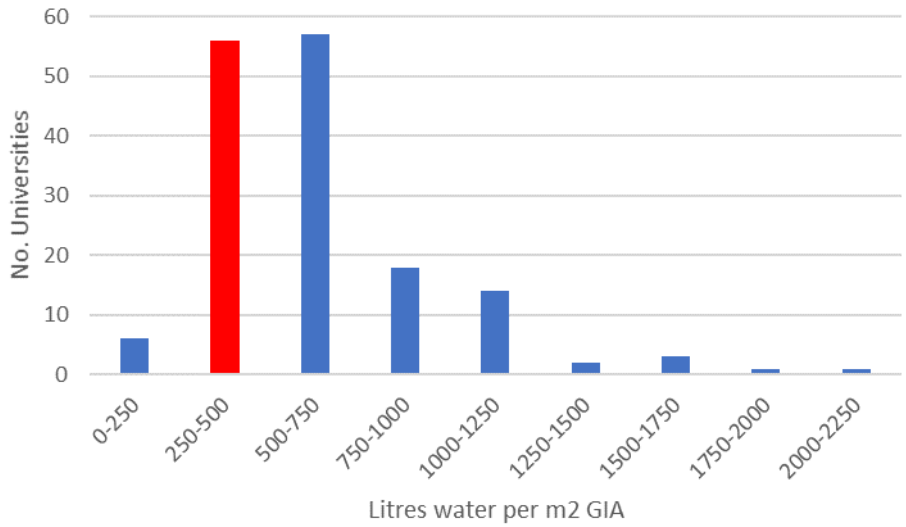

Figure 4 Water use (litres.m² GIA) in 2018-19 for universities in the UK. GCU is in the red consumption band (second from the left). Data is from HESA EMR 2018-19.

Whilst GCU is amongst the most water efficient universities in the UK, there are significant opportunities for further reducing water consumption through efficiency gains through a better understanding of where and how water is used.

Water Efficiency Measures & Interventions

Below is a list of measures and interventions the University will explore to achieve the aims of this WEP. Further detail about where, when and how these opportunities will be explored is detailed in the accompanying Water Efficiency Plan – Implementation Document (WEP-ID), which classifies interventions as: insights and monitoring; efficiency, adaptation and planning.

- Increase capacity to understand, monitor and reduce water consumption.
- Develop systems to monitor, benchmark and report water consumption.
- Develop and refine processes for minimising water pollution.
- Deliver water saving interventions.
- Water saving specifications (for refurbs and new builds).
- Explore rainfall/surface water attenuation measures.
- Implement a recognised water management framework (e.g. ISO 46001)

Water Efficiency Plan Budget

The total budget for delivering the delivering the BP is £175,000 over seven years (to 2029-30) at an average £25,000 per year (in addition to already approved staff costs). A breakdown of the costs is provided in the Water Efficiency Plan Implementation Document.

Management & Monitoring

To support the evidence-based decision-making approach, a variety of metrics will be introduced to help quantify various aspects of the WEP.

The appropriateness of metrics will be reviewed regularly to ensure that they adequately support the delivery of the WEP's aims and objectives.

Metrics will be used to report the state of water efficiency at GCU.

The execution of the WEP through the WEPID will be reviewed annually by GCU's Sustainability Forum. Progress will be reported to the University Executive Group and more widely through the sustainability pages in the University's website.

Appendix A – Contribution to the SDG

SDG	WEP contribution to SDG Target & Indicators
	**Target 6.4 - By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.** Indicator 6.4.1 – Change in water-use efficiency over time The WEP will contribute to this SDG by improving water efficiency at the University by reducing consumption and improving the University's ability to detect water loss.
	**Target 7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix.** Indicator 7.2.1 - Renewable energy share in the total final energy consumption The WEP will contribute to this SDG by reducing demand for water, which will reduce demand for energy to treat/transport water. A reduction in energy consumption means more renewable energy can be used elsewhere. Reducing demand hot water has a similar impact.
	**Target 13.2 - Integrate climate change measures into national policies, strategies and planning.** Indicator 13.2.2- Total greenhouse gas emissions per year The WEP will contribute to this SDG by reducing demand for water (including hot water) which will reduce demand for energy to treat, transport and heat water. Reducing energy associated with the treatment, transportation and heating of water has a corresponding impact on associated emissions.