### Contents

1 Introduc	ction	2
2 Backgro	ound and Context	3
3 Strategi	c Objectives	4
3.2 Gen	eral Principals	4
3.3 Stra	tegic Objectives	5
4 Funding	g	6
5 Culture	and Engagement	7
5.1 Stuc	lents	7
		7
5.3 Cha	mpions	7
5.4 Loca	al Community	7
5.5 Rese	earch, Teaching and engagement	7
6 Strategic	Utility Management	8





## 1 Introduction

Lancaster University is a signif cant energy user. Energy is critical to the campus and the services it provides to research, teaching, students and staf. Energy underpins al university life and supports our core activities.

Lancaster University recognises that its energy consumption has signif cant impact both f nancially and environmentally, and that it has a duty to minimise energy costs, reduce energy waste and carbon emissions. It also has a duty to improve the resilience of its energy supplies to enable it to better deal with supply disruptions. The university aims to address core energy requirements, providing f exible and resilient services to of set and minimise negative impact.

Lancaster University recognises the positive environmental impact it has as an institution, through the education it of ers its students, the research conducted the local community, supplier and business partnerships. The university aims to maximise these positive impacts.

The Energy & Utilities Plan forms part of the overarching Facilities Sustainability Strategy, which draws together and puts into context all environmental sustainability strategies and plans within the Facilities department.

The Energy & Utilities Plan outlines Lancaster University's strategic objectives for reducing utility consumption, costs and carbon emissions.



#### 3.3 Strategic Objectives

The University's strategic objectives are to:

- Achieve the targets outlined in its energy and carbon policy, currently 83% reduction in CO2 emissions by 2050, compared to 2005.
- Update those targets to refect the latest climate science. This will likely mean greater CO2 emissions reductions, achieved before 2050.
- Become an exemplar in practice and thinking.
- Minimise its energy consumption and costs.
- Increase its energy resilience.
- Increase support for research, teaching and

## 5 Culture and Engagement

In terms of cultural change, the Sustainability Management Group and nominated Sub-Groups will actively promote the creation and management of an environmentally sustainable culture at the university where decisions made have sustainability in mind. Cultural and behavioral change projects and initiatives may be developed as part of an integrated approach with other Faculties Sustainability Plans such as the Behaviour Change Plan. This will primarily encourage an emergence approach.

#### 5.1 Students

A focus on awareness and engagement will be delivered by promotional initiatives such as the student 'switch'of ' competition, delivered in cooperation with an external partner and the Green Lancaster team. Run annually across all student residences, subject to UPP participation, this will raise awareness of the impact utilities saving has in support of the wider carbon reduction and sustainability agenda.

## 6 Strategic Utility Management

Lancaster University aims to use the minimum amount of utilities necessary in order to conduct its operations whilst achieving low operating costs and reducing carbon emissions. It is recognised that no system can ever be 100% ef cient, however this Energy & Utilities Plan aims to continuously improve the ef ciency of the university's utilities, buildings and services infrastructure.

The ef ciency of generation, distribution and use of utilities across campus prioritised across a number of key areas.

#### 6.1 N

6.3 Infrastructure - Design, Operation and Investment



The following projects will be prioritised:

- Conversion of the district heating system to variable fow operation.
- Energy Centre separation of heating generation and distribution.
- Extensions of district heating system to the Health Innovation Campus, Infolab and wider campus.
- Feasibility study of connecting the rest of campus to the district heating system.
- Improvements to the energy metering system.
- Feasibility study for a PV Farm on campus.
- Cavity wall insulation upgrades.
- Heating controls improvement project.
- Heat pumps to deliver space heating and domestic hot water.
- Improved monitoring and control systems.
- Water borehole.

Scenario modelling will help to understand the challenges posed by LU's carbon targets, and how they relate to projected growth. The underlying energy demand prof le of the campus will change considerably; demand will be increased as a result of additional (and very highly ef cient) buildings and people, but at the same time it will be reduced as a result of improved ef ciency through building refurbishment projects and data driven optimisations. Specific aims include; extension of the district heating system to all viable buildings on campus, design specification calling for low temperature heating systems and ultimately zero carbon generation campus before 2050.

#### 6.5 Demand Led Supply

One of the features of highly ef cient utility systems is that they are demand led.

For example, demand for heat is infuenced by the University's policy on space heating which constrains both time and temperature of heating provision. Demand for heat is also infuenced by a buildings occupancy, internal and external temperatures, heat gain and other factors. Energy efficiency can be improved if the provision of heating and heating control is better adapted to individual demands for thermal comfort.

The Energy & U tilities Plan aims to improve control of utility consumption progressively to refect these factors to ensure that the optimum level of heat is provided at all times. A similar approach will be explored for other energy end-uses such as ventilation and lighting.

Demand-led utility systems imply a balance between localised and centralised control. This balance may need to evolve over time as new control systems develop, and end users become familiar with them.

# 7 Living Lab

This plan aims to promote and progress Living Lab projects to leverage the university's infrastructure, systems and processes to make it more attractive for research, teaching, research grant funding and private sector collaborations.

Lancaster Living Lab projects seek to develop Lancaster University as a facility for applied energy research, teaching and practise. It aims to open up the campus, its facilities, its information and its management structures and processes for students, staf and businesses to learn about and improve the way they use energy, in a safe and controlled manner. It leverages existing infrastructure and activities to support the core priorities of the university. Living Lab projects will provide Lancaster University with a unique selling point to join and lead consortia in energy related research bids and establish itself as a globally signif cant university in the feld of energy.

Collaborations will be made with the Centre for Global Eco-Innovation, the Data Science Institute and the Faculties.



#### 8 Governance & Review

Responsibility for management and delivery of the Energy & Utilities Plan resides with the University Energy Manager, based in Facilities. Progress in implementing the Energy & Utilities Plan is reported via Facilities line

