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Prepared on 17/11/2021 by Liz Vander Meer for SRS Living Lab applications

# Living Lab project brief

Adapting Hudson Beare Lecture Theatre

## Key SRS contact for this project:

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## Description of the paper

This paper provides a brief overview of a project that could usefully inform the SRS Department's work. This paper describes a proposed Living Lab project that SRS are offering a student to apply to complete as the accredited dissertation portion on their course. Living Labs offer real-life research opportunities for students and researchers, evidence-based recommendations for operational staff and opportunities for research impact for academics.

The question and research of a Living Lab is intended to inform and/or make recommendations for the SRS Department areas of work. The project is owned by the SRS Department and the successful student will be asked to sign a Memorandum of Understanding before proceeding.

This research aligns with one main and two sub themes of the Sustainable Development Goals (see below for more context).

## The Vision for Change:

The project is meant to provide a potential approach to other listed or traditional buildings when it comes to adaptation action; this approach, if viable, would be referenced in our living document Adaptation Framework and inform Estates practice across relevant University buildings.

## Draft research question

Considering data obtained from installed sensors as well as the current building fabric, layout and external context, what is the best way to address temperature, moisture and ventilation issues in Hudson Beare Lecture Theatre, now and in terms of adaptation to climate change?

## Background

University of Edinburgh Estates, supported by SRS (Research and Policy Manager) and Historic Environment Scotland (HES) began a feasibility study in 2018-19 to prepare the ground for a project to adapt the Category B listed Hudson Beare Lecture Theatre through several refurbishment actions; the lecture theatre has been known to have issues with hot/cold balance in our changing climate, thus being uncomfortable for staff and students. Listed buildings will need to be maintained into the future, a lasting part of the University estate, and this project can be seen as a pilot for future adaptation work on historic buildings across campuses. This work reflects goals set out in the University's Adaptation Framework.

Sensors (tinytags) were installed in the Lecture Theatre and on an external wall from 2018 to 2019, capturing data about moisture and temperature. This data, as well as a dissertation undertaken by a student in 2021, will be available to the student, along with a previous living lab project that provides an approach to adaptation of traditional buildings on our campuses. The student will work with SRS, Estates and HES, contributing a significant piece of work for the feasibility study. HES plans to develop Hudson Beare as a case study that can influence refurbishments both on and off University campuses.

This project addresses SDGs: 13 (climate action), 7 (energy) and 3 (health and wellbeing).

## Objectives

Present the case for building adaptation actions in the Scottish context, and in our university context, considering traditional and listed buildings (this can frame the detailed study)

Using data from sensors and any relevant desk research, understand the dynamics of hot, cold, moisture and, based on current fabric and ventilation system, also air flow in Hudson Beare Lecture Theatre (without forgetting the external context)

Explore possible (Innovative) solutions to hot/cold balance, moisture and ventilation issues, in conversation with HES, considering current and future climates

Deliver a final report with conclusions and recommendations

## Data set provision

Research data may be available from the publically available Data Library found here:

[www.ed.ac.uk/sustainability/programmes-and-projects/student-leadership-for-sustainability/living-lab-projects/sdg-data-library](http://www.ed.ac.uk/sustainability/programmes-and-projects/student-leadership-for-sustainability/living-lab-projects/sdg-data-library)

Use the table below to state where and what type of data would be relevant for this research. If the data needs to be generated, sourced from elsewhere or other colleagues, please state this.

<i>Data needed for this project</i>	<i>Data sets available from and contact information</i>
<b>Adaptation resources from EAUC (includes our student report on adaptation of traditional buildings)</b>	<a href="http://www.sustainabilityexchange.ac.uk/adaptation">www.sustainabilityexchange.ac.uk/adaptation</a>
<b>HES</b>	Mairi Davies – mairi.davies@hes.scot
<b>UoE Estates Team</b>	George Muir – G.Muir@ed.ac.uk
<b>Dissertation project on Hudson Beare Lecture Theatre</b>	Supervisor for student, Gary Watmough – gary.watmough@ed.ac.uk

## Outputs

The project write up or dissertation will be a researcher's own piece of research. They will decide what they think the results show and draw their own conclusions. The project will need to be shared with colleagues within and out with SRS, so that we can try to make operations changes based on the researcher's recommendations.

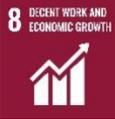
Output format	Not applicable or Yes
Presentation to a number of stakeholders	
Mixed media resource for reuse	
Report with operational recommendations	Yes
Resources for staff/student behaviour change	
Resources for staff/student training	

## Transformational change with the SDGs

The Sustainable Development Goals showcase 17 things humanity must do to ensure peace and prosperity for people and the planet, now and into the future.

The information in this table was obtained with permission from the UN sustainable goals website, [www.un.org/sustainabledevelopment/sustainable-development-goals](http://www.un.org/sustainabledevelopment/sustainable-development-goals)

The Sustainable Development Goals for 2030	Yes is added next to the SDG that this project works on
 <p><b>1 NO POVERTY</b></p> <p><b>e.g. Donate what you don't use.</b> Economic growth must be inclusive to provide sustainable jobs and promote equality. More than 700 million people still live in extreme poverty.</p>	
 <p><b>2 ZERO HUNGER</b></p> <p><b>e.g. Waste less food and support local farmers.</b> A third of the world's food is wasted, yet 821 million people are undernourished. The food and agriculture sector offers key solutions for development, and is central for hunger and poverty eradication.</p>	
 <p><b>3 GOOD HEALTH AND WELL-BEING</b></p> <p><b>e.g. Vaccinate your family.</b> Vaccinations resulted in an 80% drop in measles deaths between 2000 and 2017. Ensuring healthy lives and promoting the well-being for all at all ages is essential to sustainable development.</p>	Yes
 <p><b>4 QUALITY EDUCATION</b></p> <p><b>e.g. Help educate the children in your community.</b> 617 million children and adolescents lack minimum proficiency in reading and mathematics. Obtaining a quality education is the foundation of improving people's lives and sustainable development.</p>	
 <p><b>5 GENDER EQUALITY</b></p> <p><b>e.g. Empower women and children and ensure their equal rights.</b> One in three women has experienced physical and/or sexual violence. Gender equality is not only a fundamental human right, but a necessary foundation for peaceful, prosperous and sustainable world.</p>	
 <p><b>6 CLEAN WATER AND SANITATION</b></p> <p><b>e.g. Avoid wasting water.</b> Water scarcity affects more than 40% of the world's population. Clean, accessible water for all is an essential part of the world we want to live in.</p>	
 <p><b>7 AFFORDABLE AND CLEAN ENERGY</b></p> <p><b>e.g. Use only energy-efficient appliances and light bulbs.</b> Three billion people still lack clean cooking fuels and technologies. Energy is central to nearly every major challenge and opportunity.</p>	Yes

	<p><b>e.g. Create job opportunities for youth.</b> One-fifth of young people are not in education, employment or training. Sustainable economic growth will require societies to create the conditions that allow people to have quality jobs.</p>	
	<p><b>e.g. Fund projects that provide basic infrastructure.</b> Roads, water, sanitation and electricity remain scarce in many developing countries. Investments in infrastructure are crucial to achieving sustainable development.</p>	
	<p><b>e.g. Support the marginalised and disadvantaged.</b> The poorest 40% of the population earn less than 25% of global income. To reduce inequalities, policies should be universal in principle paying attention to the needs of disadvantaged and marginalised populations.</p>	
	<p><b>e.g. Bike, walk or use public transportation.</b> Nine out of ten urban residents breathe polluted air. There needs to be a future in which cities provide opportunities for all, with access to basic services, energy, housing, transportation and more.</p>	
	<p><b>e.g. Recycle paper, plastic, glass and aluminium.</b> By 2050, the equivalent of almost three planets could be required to sustain current lifestyles. It's about doing more and better with less and decoupling economic growth from environmental degradation.</p>	
	<p><b>e.g. Act now to stop global warming.</b> Global emissions of carbon dioxide (CO<sub>2</sub>) have increased by almost 50% since 1990. Climate change is a global challenge that affects everyone, everywhere.</p>	<p><b>Yes</b></p>
	<p><b>e.g. Avoid plastic bags to keep oceans clean.</b> Over three billion people depend on marine and coastal biodiversity for their livelihoods. Careful management of this essential global resource is a key feature of a sustainable future.</p>	
	<p><b>e.g. Plant a tree and help protect the environment.</b> Forests are home to more than 80% of all terrestrial species of animals, plants and insects. Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss.</p>	
	<p><b>e.g. Stand up for human rights.</b> Access to justice for all, and building effective, accountable institutions at all levels. In 2018, the number of people fleeing war, persecution and conflict exceeded 70 million.</p>	<p><b>Yes</b></p>
	<p><b>e.g. Lobby your government to boost development financing.</b> Revitalise the global partnership for sustainable development. Achieving the SDGs could open up US\$12 trillion of market opportunities and create 380 million new jobs by 2030.</p>	

# The University of Edinburgh Strategy 2030

Strategy 2030 can be found here:  
[www.ed.ac.uk/about/strategy-2030](http://www.ed.ac.uk/about/strategy-2030)

## The Social and Civic Responsibility Delivery Plan

To deliver Social and Civic Responsibility at the University of Edinburgh, we have chosen three strategic objectives and one cross-cutting theme.

The Social and Civic Responsibility Delivery Plan can be found here and in a summary box below:  
[www.ed.ac.uk/files/atoms/files/social\\_and\\_civic\\_responsibility\\_delivery\\_plan\\_2020.pdf](http://www.ed.ac.uk/files/atoms/files/social_and_civic_responsibility_delivery_plan_2020.pdf)

**Social and Civic Responsibility – Delivery Plan**

Aligning with the following SDGs

Contributing to additional SDGs

- 1 We will become a zero carbon and zero waste university.**
- 2 We will widen participation in higher education and support inclusion.**
- 3 We will work together with local communities**

**Cross cutting theme:** In our operations, research and teaching we will engage critically with, and contribute to the Sustainable Development Goals

The infographic displays the following SDG icons:

- Aligning with the following SDGs:** 12 (Responsible Consumption and Production), 13 (Climate Action), 14 (Life Below Water), 15 (Life on Land), 4 (Quality Education), 8 (Decent Work and Economic Growth), 10 (Reduced Inequalities), 1 (No Poverty), 11 (Sustainable Cities and Communities).
- Contributing to additional SDGs:** 3 (Good Health and Well-being), 6 (Clean Water and Sanitation), 7 (Affordable and Clean Energy), 5 (Gender Equality), 9 (Industry, Innovation and Infrastructure), 2 (Zero Hunger), 16 (Peace, Justice and Strong Institutions), 17 (Partnerships for the Goals).

The table below shows which Social and Civic Responsibility 2030 objectives this project is relevant for how this project works towards those objectives.

Social and Civic Responsibility Delivery Plan Objectives and one cross cutting theme	Project’s link to the objectives, how it is relevant and how this project works towards those objectives.
<p><b>We will become a zero carbon and zero waste university</b> Increasing opportunities and raising aspirations by making education and employment an achievable goal for more people in Scotland and globally.</p>	<p>This project directly links to this objective by asking the research to look at ways to adapt historically protected buildings like Hudson Beare to ensure they are operating efficiently with the lowest Carbon footprint possible, while being able to fend off extreme weather events expected to be seen in this area of Scotland.</p>
<p><b>We will widen participation in higher education and support inclusion</b> Increasing opportunities and raising aspirations by making education and employment an</p>	<p>This project directly links to this objective by asking the researcher to look at ways to adapt historically protected educational buildings like Hudson Beare to ensure they maximise comfort</p>

<p><b>achievable goal for more people in Scotland and globally.</b></p>	<p>and learning potential, where results could be utilised across other similar buildings.</p>
<p><b>We will work together with local communities to contribute to improve the lives of people across the Edinburgh City Region and beyond.</b></p>	<p>n/a</p>
<p><b>Cross cutting theme: In our operations, research and teaching we will engage critically with, and contribute to the Sustainable Development Goals including the promotion, protection and respect for human rights.</b></p>	<p>This projects works directly on SDG 7,13 and 16 with crossover SDGs implicit.</p>

If you are interested in this project for your dissertation, please email the SRS Project Coordinator for Living Labs and the Sustainable Development Goals [Vanessa.McCorquodale@ed.ac.uk](mailto:Vanessa.McCorquodale@ed.ac.uk) to express your interest or visit our Living Labs website for more information [www.ed.ac.uk/sustainability/programmes-and-projects/student-leadership-for-sustainability/living-lab-projects](http://www.ed.ac.uk/sustainability/programmes-and-projects/student-leadership-for-sustainability/living-lab-projects)