Challenge 1

Land Use for Community Energy

The Challenge

Assess the availability of land or publicly/commercially owned sites in areas of high fuel poverty that could be used for community energy projects to tackle the dual goals of achieving Net Zero and addressing fuel poverty.

Proposed by

South Yorkshire Sustainability Centre

Sheffield City Council

Context

The South Yorkshire Sustainability Centre (SYSC) brings together researchers and policymakers to explore solutions that link climate action with social benefit. One of SYSC's areas of interest is how community energy projects can help to reduce both gas emissions and fuel poverty. This challenge is also of importance to the South Yorkshire Mayoral Combined Authority (SYMCA) which plays a key strategic role in setting and delivering the region's climate, energy, and economic policies across the region.

Community energy projects are renewable energy or energy-saving initiatives that are owned or led by local communities (e.g., solar panels on roofs, community-owned wind turbines). These projects have the potential to provide cheaper, greener energy while benefiting local communities. Government authorities (e.g., councils) can also be involved in this process as it often aligns with local, regional, and national sustainability and housing strategies. They may support such projects by providing funding, sites for development, and planning permissions.

Community energy projects can also help to address fuel poverty. Some households struggle with high energy costs and access to energy-efficient housing which can put an undue burden on households and communities. Although exact definitions can vary, fuel poverty in England is measured using the Low Income Low Energy Efficiency (LILEE) indicator. Identifying suitable land and space for community energy projects in areas most affected by fuel poverty could address two goals at once: reducing carbon emissions and improving social equity.

This challenge tasks you to use data to identify opportunities for community energy projects on available land in high fuel poverty areas, helping Sheffield and South Yorkshire

achieve its Net Zero goals while ensuring the benefits are shared fairly across communities.

Links to relevant information

Net Zero Strategy: Build Back Greener - GOV.UK

Sub-regional fuel poverty in England, 2025 report (2023 data) - GOV.UK

Fuel Poverty in Sheffield - NEA

Definition, impact and sector potential | Community Energy England

Our response to barriers to community energy projects call for evidence

Community energy and low-income households | Joseph Rowntree Foundation

Community Energy Toolkit - SYSC

Map of Community Energy Projects in England

Geographical and Time Constraints

Geography

We suggest that you focus on the Sheffield Metropolitan District. If time and data allow, expand your analysis to the South Yorkshire Combined Authority, and then to the wider Yorkshire and the Humber region. You can find the official geographical definition of these areas in the links below.

Links to relevant information

Sheffield (E08000039) - ONS

South Yorkshire (E47000002) - ONS

Yorkshire and The Humber (E12000003) - ONS

Explanation of UK Geographies - ONS

Timeframe

Your proposed solutions should be achievable by 2040 (i.e., 10 years ahead of the UK's 2050 Net Zero target).

Links to relevant information

United Kingdom | Climate Action Tracker

The Data

All the data and information below comes from public and trusted sources. Please note that you may need to look for additional datasets should you wish to expand the geographical area or produce more comprehensive solutions.

Not all data is neatly available in a spreadsheet, so you may need to get creative with transforming the data into a usable format or finding the original data source(s).

Also, note that not all datasets may be from the same time period so you will need to consider what that means for your solution.

IMPORTANT: You do not need to use all of the provided data and resources!

Links to relevant data and information

Local area data: fuel poverty

Fuel Poverty Detailed Tables 2025 (2024 data) - GOV.UK

Sheffield Housing and Economic Land Sites Map and Sheffield Housing and Economic Land Availability Assessment - December 2023

HM Land Registry - GOV.UK

Datasets | Planning Data and Map of planning data for England

Business Rates | Data Mill North - allows you to identify the location of commercial sites in Sheffield

Sheffield City Council Open Data - includes more information about sites and green spaces

Find open data - GOV.UK - link to public / open data for additional information and consideration

Possible Approaches

Please note that these are **suggestions only and you do not need to follow them**! The approach of each team will depend on the members' backgrounds and skills. There is no single "correct" approach to this challenge.

Beginner-friendly to Intermediate

1. Identify areas of fuel poverty.
2. Identify available public/commercial land.
3. Understand whether the identified public/commercial land is suitable for community energy projects.
4. Combine fuel poverty data with land availability data.
5. Classify identified public/commercial land in areas of fuel poverty based on availability and suitability.
6. Highlight prime areas for potential community energy projects.

Advanced

The above-mentioned steps, plus:

1. Conduct a geospatial analysis of land use and energy potential.
2. Estimate the impact of potential community energy projects (e.g., energy generation potential in kWh).
3. Build a dashboard or a model that can be used by policymakers to allocate land to community energy projects.

What Do Teams Need to Produce

A **10-15 minute presentation** of the team's work to be presented on Day 5, 19 September. Further information about the presentation can be found in
Guidance for Team Presentations - Net Zero Data Challenge 2025.pdf

File(s) or link to the solution submitted to a shared Google Drive Folder. Further information will be provided once the challenge commences. File format will depend on the work that has been done. It could be code, a spreadsheet, PDFs, etc.

What We're Looking For

It's important to note that we do not have a specific solution or approach in mind that you must produce. Your approach should be your own, as we want to see how you will solve the problem!

However, judges will evaluate your solution based on the criteria outlined in
Judging Criteria – Net Zero Data Challenge 2025.pdf

1. Relevance
2. Innovation
3. Use of data
4. Impact and feasibility
5. Presentation and communication

Have a Question?

Don't forget that you can ask us a question via our dedicated Google Group:
groups.google.com/a/sheffield.ac.uk/g/net-zero-data-challenge-group