

ZERO CARBON

RUGELEY

Smart Local Energy System

Design Demonstrator



ZERO CARBON RUGELEY

WP17-D12-2: ZERO CARBON RUGELEY POP-UP ENGAGEMENT: INSIGHTS ON THE ENERGY TRANSITION, MOBILITY, BUILDINGS & COMMUNITY ENERGY

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Zero Carbon Rugeley pop-up
engagement: community insights on the
energy transition, mobility, buildings and
community energy



1 Executive summary

This report details insights generated as part of pop-up (informal, 'drop-in') engagement undertaken as part of the user-centric design and community engagement activities led by Keele University in collaboration with New Vic Borderlines as part of the InnovateUK Zero Carbon Rugeley project which aimed to design a smart local energy system for the town of Rugeley in Staffordshire, with user-centric design principles at its heart. This report outlines the design of the pop-up engagement activities before detailing the data gathered across two pop-up events and discussing insights to inform further engagement activity and key stakeholders to inform approaches to catalysing low-carbon behaviour change.

Both quantitative and qualitative data were collected from the engagement activities. Qualitative data was coded into themes, across the areas of buildings, mobility, and the energy transition. These data generate insights into participant attitudes towards different aspects of smart local energy systems (SLES), and gauge local community appetite for uptake of SLES offerings, as well as develop understanding of barriers and concerns related to a smart local energy transition.

Participants largely self-reported a willingness/readiness to change their energy use both in their mobility habits and in their domestic energy use. However, this willingness was not reflected in their discussion of mobility activities, where multiple barriers/objections to low-carbon mobility solutions were presented. Engagement activity demonstrated significant variation in participants' levels of energy literacy and the prevalence of myths and misconceptions around aspects of the energy transition. These responses highlight the centrality of education and training to shift understanding away from traditional understandings of our energy systems and common areas of fear, uncertainty and doubt, in order to catalyse a SLES-ready community.

2 Contents

1	Executive summary.....	3
2	Contents.....	4
3	Introduction	5
4	Engagement activity design.....	5
5	Jubilee Street Party pop-up event (June 2022)	10
5.1	Results and findings.....	10
5.1.1	Quantitative data (Activity 2).....	10
5.1.2	Qualitative data.....	11
5.1.2.1	Activity 1 - 70 years of energy	12
5.1.2.2	Activity 3 - Mobility	14
5.1.2.3	Activity 4 - Buildings	17
6	Artisan Market pop-up event (July 2022)	21
6.1	Results and findings.....	21
6.1.1	Quantitative data (Activity 2).....	21
6.1.2	Qualitative data.....	22
6.1.2.1	Activity 1 - Energy transition	22
6.1.2.2	Activity 3 - Mobility	24
6.1.2.3	Activity 4 - Buildings	25
7	Rugeley Eco-Day (April 2022)	27
7.1	Mobility	27
7.2	Mobility Hubs	29
7.3	Community Energy	29
8	Discussion and conclusion	31
9	References	32

3 Introduction

Pop-up engagement, which are classed as informal, 'drop-in', in person activity was undertaken as part of the user-centric design and community engagement activities as part of the InnovateUK funded Zero Carbon Rugeley project. These in-person events were only held in the latter stages of the project (which started in March 2020 the month that COVID-19 lockdowns started) once lockdown restrictions were eased and confidence in attending in person events had been regained. This style of pop-up engagement was designed to build broader engagement with the Zero Carbon Rugeley project with a broader range of people within the Rugeley community following the engagement activity that had been undertaken in the project's first phase which involved many more time intense activities, as well as social media engagement. Keele University worked alongside engaged research practitioners from New Vic Borderlines to design and deliver the activities detailed below. Engagement activities were designed to be transferable to any public facing event, enabling researchers to meet the Rugeley community where they were and demonstrating a shift in approach to public engagement from earlier stages of the project where community members were invited to attend and participate in events hosted by the ZCR consortium.

Following design of the activities, the engagement activities were taken to three community events in Rugeley which are detailed in this report. The first was a Jubilee Street Party held in Rugeley town centre to mark the Queen's Platinum Jubilee in June 2022. The second event was a ZCR stall in July 2022 at the Artisan Market held in each month in Rugeley town centre. The third event was a 'Rugeley Eco-Day held in the Rugeley Community Centre. At all the events ZCR held a stall in which community members could drop in and participate in SLES-related activities aimed at generating insights for the ZCR consortium.

4 Engagement activity design

This section outlines the engagement activity design and details the kinds of data the engagement activities collected.

For pop-up activity it is not possible to know ahead of time how long each participant will engage, so it is important to design activities which allow for anything from 30 second passing engagement to around 10 minutes of detailed facilitated discussion. To this end, engagement activity was designed at two levels with participants free to engage at any level. The levels are: (1) 30 second to 2-minute ice breaker activities for passing engagement; (2) 5-10 minutes of activity focussing on one or more

aspects of SLES. Each level of activity includes a short provocation, encouraging participants to answer a closed question, as part of facilitating a broader discussion as participants unpack the reasons for their answer. This activity gathers both quantitative and qualitative data, with the former gauging appetite for different aspects of SLES and the latter providing a descriptive insight into the range of attitudes and perceptions accounting for the quantitative choices.

For the Jubilee Street Party pop-up, each of the four activities below were covered, while for the Artisan Market pop-up event only activities 2 to 4 were carried out. The activities undertaken at the Rugeley Eco-Day event were different to the Jubilee Street Party and Artisan Market and are outlined separately in section 7.

Level 1 activities (30 seconds – 2 minutes)

These activities aim to engage passers-by quickly in the activity. Data/insight is top-level, as the primary use of the activities are as “ice breakers”, but the activity also aims to gather data around the energy literacy of participants, their attitudes to the energy transition, and appetite for different low-carbon solutions.

Activity 1: Energy over the last 70 years

Today is about 70 years of history (the time the Queen has been on the throne), how do you think energy has changed in that time? /How have you seen energy in Rugeley change over time?

- i. How do you think electricity was made at the time of the Queen’s coronation?*
- ii. Where does your electricity come from now?*
- iii. How has the town changed because of this? / How do you feel about the change?*

Activity 2: Changes for net zero

Where energy comes from is changing again to help us reach net-zero. What would you rather change about your life as part of the transition and why? (Participants vote by putting buttons in jars).

- i. How your house works?*

ii. *How you travel around?*

iii. *Both*

Level 2 activities (5 – 10-minutes)

Once participants have completed the second level 1 activity, and have indicated whether they are more open to changing mobility habits, changing their homes or both, participants then progress to a level 2 activity. These activities aim to collect more detailed data around specific aspects of SLES. Each activity comes with another “button in jar” poll. This allows us to track how many participants engage with each activity as well as gather some initial quantitative data. *(Note participants who selected ‘both’ in the previous activity can complete either or both activities depending on their level of engagement).*

Activity 3 - Mobility as a Service (MAAS)/Demand Responsive Travel App:

This activity aims to gather participant data around travel, the barriers to using active travel or public transport and the potential to change travel habits over the long term.

Materials:

Low detail map of Rugeley, tape and objects to mark out journeys, paper and pens to make legend for the map.

Activity:

Participants use the materials to mark out journeys on the map and answer the following questions.

Q1 – What journey do you make most often? (What do you like about it, what don’t you like etc.)

Q2 – If you weren’t going to use your car, how would you make this journey? What would be the benefit of not using the car? (to individuals/communities).

Q3 – What’s stopping you from walking/using public transport?

Q4 – If you were going to make a key to this map for someone else to make this trip what would you want them to know? What would you like to know? How could it make your journey better?

(Note: Facilitators should aim to bring out participants perceptions/assumptions/understandings of active travel.)

Button question:

If you could give up your car, would you want to? Why?

Activity 4 – Buildings:

This activity aims to gather participants’ understandings of energy use in the home and attitudes toward retrofit.

Materials:

Dolls’ house, blank cards, tape, objects.

Activity:

Participants use the above materials to answer the following.

Q1 - How do you use energy in your home? (i.e., heating, electricity uses)

Q2 - What do you know about where the energy comes from? How do you feel about it?

Q3 - Has it always worked this way? (Have you ever been in a house with a coal fire). How did you feel about it?

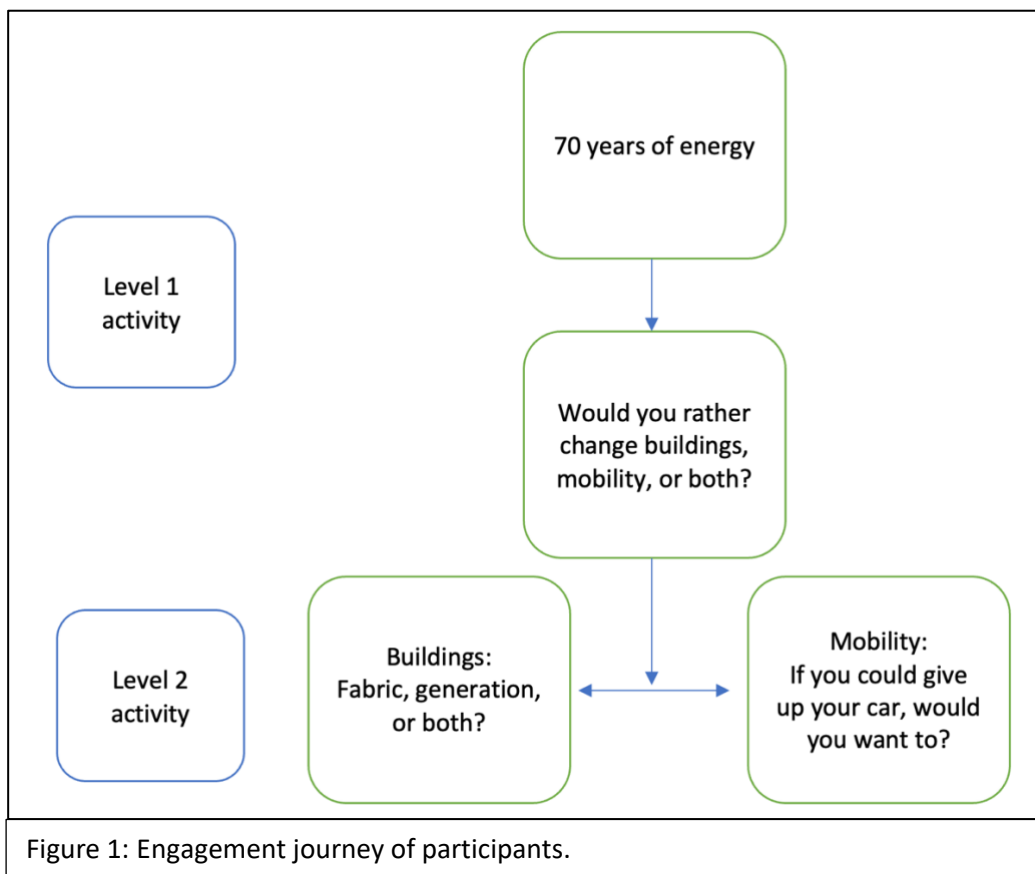
Q4 - Where energy comes from is changing again. What about the house needs to change? What would you want to stay the same?

Button Question:

Would you be more likely to retrofit the fabric of your home, change the technology in your home, or would you want to do both? Why?

As is evident from the interventions outlined above, a decision was taken to leave out any ‘neither’ options in participants responses (i.e., participants could only give a preference for low-carbon measures rather than opt for no low-carbon measures). This decision was in part taken to underline the necessity of a zero-carbon transition reflected in national and local government targets etc. (i.e., “where energy comes from *is* changing”) and in part under the assumption that any objections to low-carbon measures would be expressed in participants’ qualitative responses.

Data was collected from these activities as photographs of the participants’ inputs. Facilitation was carried out in large by New Vic practitioners who were able to talk participants through key concepts where necessary (fabric retrofit, net zero etc.), allowing field notes to be collected by researchers from Keele University. Some audio recordings of highly engaged participants were collected by New Vic where consent had been obtained. Figure 1 provides a visual summary participants engagement journey at pop-up events.



5 Jubilee Street Party pop-up event (June 2022)

Keele University and New Vic Borderlines staged a pop-up engagement in the town centre as part of on the theme of 70 years of energy heritage, as part of the Rugeley Jubilee Street Party organised by the Town Council. The aim of the pop-up activity was to increase the visibility of the ZCR project, promote upcoming ZCR events, as well as build a contact list for members of the public interested in continuing engagement with the project. This section outlines the data collected in detail. It includes analysis and coding of data collected to feed insight from the engagement back into the wider consortium.

5.1 Results and findings

5.1.1 Quantitative data (Activity 2)

Table 1 outlines quantitative data gathered as part of the ‘buttons in jars’ activities. While 54 participants were engaged across the day in total, participants cast votes in some or all the jars, meaning that there are not 54 responses per question. In general, there was a good understanding of key concepts like zero-carbon and net-zero, though at times this may have required some explanation by facilitators.

Table 1: Quantitative data from the Jubilee Street Party engagement.	
Total number engaged: 54	
<p><i>Q1) Where energy comes from is changing again to help us reach net-zero. What would you rather change about your life as part of the transition and why?</i></p> <p>Total answers: 33</p>	Change my home: 12
	Change travel: 5
	Change both: 17
<i>Button Question 1:</i>	Change Fabric: 1

<p><i>Would you be more likely to retrofit the fabric of your home, change the technology in your home, or would you want to do both? Why?</i></p> <p>Total answers: 25</p>	Technology: 11
	Change both: 13
<p><i>Button question 2:</i></p> <p><i>If you could give up your car, would you want to? Why?</i></p> <p>Total answers: 23</p>	Yes: 12
	No: 11

5.1.2 Qualitative data

The following section outlines the qualitative responses gathered from participants. Each activity is considered in turn, outlining the coding of responses which has been undertaken by researchers. As with the quantitative data above, participants engaged with some or all the activities meaning that there were not 54 responses collected for each individual activity. In addition, the data below is pooled from written responses participants gave on blank cards used to label the doll's house and/or the map of Rugeley as part of the discussion, as well as from field notes taken by the researcher. As a result of the "drop-in" nature of the activity it was not possible for the researcher to observe every interaction between facilitators and participants, meaning that some responses were collected solely on cards (figure 2), others solely in field notes, and others appearing in both data sets.



Figure 2: Example of participant responses given on cards for the dolls' house

5.1.2.1 Activity 1 - 70 years of energy

As an icebreaking activity designed for short passing engagement with participants in keeping with the day's main event to celebrate the Queen's Jubilee, the data gathered at this stage are high level and limited in scope. However, it provides some preliminary insight into participants' sense/experience of energy literacy and transition in their lifetimes. Energy literacy was generally low, with most participants unable to identify how the energy they use is made and having limited understanding of how energy generation has changed over time. Perhaps owing to this, the bulk of the data gathered relates to energy in the present and future. Responses are categorised broadly as positive and negative views of energy transition across past, present, and future (table 2).

Table 2: Qualitative data from level 1 activity: 70 years of energy).

Code	Response	Field notes
Energy transition (past/present - positive)	<i>'Air has gotten cleaner (since closing of the power station)'</i>	Participant viewed the decommissioning of the power station and the mine positively, recalling that soot used to collect on windowsills and that her GP remarked that there was high incidence of asthma in Rugeley.

	<p><i>'Concerned about future for kids'</i></p>	<p>Concern for children's futures was a common theme across participants with families and second only to the cost of energy consumption.</p> <p>This framing was the primary environmental concern, rather than for example concern for biodiversity. This concern meant that the energy transition was viewed in a positive light</p>
	<p><i>'Need to nationalise energy'</i></p>	<p>Participant offered this response as part of a criticism of a perceived focus on individual behaviours in the discourse around the energy transition, stating that they believed central planning and control over energy systems was a significant part of the solution.</p>
	<p><i>'Waterfall on heritage trail. Power it up!'</i></p>	<p>Participant was keen to use local assets as energy infrastructure.</p>
<p>Energy transition (present/future – negative)</p>	<p><i>'Wind turbines disruptive to nature'</i></p>	<p>This was a relatively uncommon objection but was based in an articulated desire to protect local natural assets (but may have had other reasons underlying this).</p>
	<p><i>'Community energy is a postcode lottery'</i></p>	<p>This statement was made as part of the same exchange with the participant above who offered the nationalisation of energy assets as a positive vision for the future.</p> <p>By contrast, the participant viewed community energy options negatively</p>

		offering the explanation that variances in the natural and built environment, as well as in degrees of community engagement/infrastructure would create disparities in access to renewable energy.
	<i>'RET (Renewable Energy Technology) materials non-recyclable'</i>	Participant offered the statement as "something they had heard" rather than as a statement of belief/fact, but nonetheless offered it as a concern about the energy transition.

Broadly speaking, participants had a positive attitude towards the energy transition, offering positive perceptions of the decommissioning of coal mines and the power station locally and recognising a need for transition based primarily in concerns about cost, but also the future wellbeing of younger relatives. The responses also showed that where there was scepticism and distrust toward low-carbon solutions this was framed around concerns about conservation of natural assets and ensuring a just transition.

5.1.2.2 Activity 3 - Mobility

This section presents data (table 3) collected as part of the first level 2 activity, mobility. As with the level 1 activity above, responses are sub-coded as "positive" and "negative attitudes toward mobility solutions, with primary codes categorised across public transport, active travel (walking and cycling), and electric vehicles (EVs). As participants did not offer any positive perspectives on public transport, subcodes are categorised as relating to cost, time, and practicality. Data detailing negative attitudes toward EVs has a secondary set of sub-codes across cost, practicality, and scepticism.

Code	Response	Field notes
Active travel (negative)	<i>'Bad weather'</i>	
	<i>'Tiring after work'</i>	

	<i>'Country roads'</i>	Participant highlighted a lack of confidence cycling along country roads around Rugeley.
Active travel (positive)	<i>'Not stuck in traffic'</i>	The two positive comments about active travel were made by two college age participants. Active travel was framed in terms of wellbeing - "clears my mind" and often preferable to vehicle travel at peak times. It may be important to note that neither participant had a personal car, so these reflections are made in relation to public transport, without the lived comparison of car ownership and use.
	<i>'Clears my mind'</i>	
Public transport (cost)	<i>'Cost of buses'</i>	Cost of buses was seen as a barrier to using public modes of transport, particularly for families buying multiple tickets.
	<i>'Cost of public transport (tickets for kids)'</i>	
Public transport (time)	<i>'Too much time to do school and work.'</i> <i>'School runs/catchment/choice'</i>	Several participants highlighted that having both school runs and work commuting to do made public transport less viable as a regular mobility option. One participant drew attention to school catchment areas as creating a problem. Their family included children with specialist educational needs and local authority transport provision is withdrawn if the family choose to send children anywhere other than the nearest available school. The withdrawal

		of free local authority transport had led to the family relying on a personal vehicle for school runs.
	<p><i>'Need more regular buses'</i></p> <p><i>'Trains not frequent'</i></p>	<p>For participants without families the regularity of public transport was a key barrier. This was in relation to both regularity throughout the day and to the start and end of service times.</p> <p>Regularity throughout the day related primarily to commuting to work (i.e., participants feeling that their commute would be too long on public transport), whereas the start and end times of services related to leisure activities (i.e., not being able to use public transport to get home from a night out).</p>
Public transport (practicality)	<i>'Need to move shopping around.'</i>	Practical barriers to public transport use tended to relate to transporting people and goods. This included shopping and leisure activities for people with families.
	<i>'Couldn't give up personal car with kids.'</i>	
EV (positive)	<i>'I like having a nice car'</i>	Positive perceptions of EVs were sometimes framed in terms of luxury (i.e., EVs are the latest and most modern vehicles).
	<p><i>'Need to move forward'</i></p> <p><i>'Cost of running it'</i></p>	<p>Other positive perceptions viewed EVs as a necessity of the energy transition, with the motivation being environmental concerns.</p> <p>Several participants also drew attention to the cost of running their current vehicles as a motivation towards EV use.</p>

EV (negative - cost)	<i>'EVs are expensive'</i>	As with other low-carbon solutions cost is articulated as the primary barrier to opting-in across participants.
EV (negative – practicality)	<i>'Not many charging points'</i>	
EV (negative – scepticism)	<i>'EVs have to be charged (still burn fossil fuels)'</i>	Many participants exhibited scepticism towards EV use as a low-carbon solution.
	<i>'EVs still burn fossil fuels'</i>	This scepticism primarily focused on an awareness that the grid is yet to be fully de-carbonised, though perhaps indicates a lack of awareness of the extent to which decarbonisation has taken place, and the extent to which renewables have been added to the energy mix in the grid as well as the trajectory of decarbonisation.
	<i>'Where's the electric come from?'</i>	

The above shows a significant number of negative perceptions toward low-carbon mobility solutions across participants. Participants offered some positive perceptions of active travel and EV use, with positive perceptions of active travel being largely held by younger participants, likely as a result of less experience of car ownership, potentially more flexible schedules, and greater fitness. Participants expressed the main barriers to alternative mobility solutions as centred on cost and practicality, with several participants showing significant amounts of scepticism toward EVs as a solution.

5.1.2.3 Activity 4 - Buildings

Table 4 presents data collected as part of the second level 2 activity focusing on buildings. Participants' attitudes towards the energy transition in the home were overwhelmingly positive. As a result, responses, rather than being coded as positive and negative are coded across cost, practicalities, reassurance and safeguards, and governance. Whilst cost was again the primary articulated barrier to the uptake of low-carbon solutions, it was also a key motivational driver in the context of the energy price crisis and a useful framing for positive suggestions for overcoming barriers. Some participants were motivated to transition their domestic energy use by

environmental concerns, though this was either a marginal perspective or very much secondary to cost considerations.

Table 4: Qualitative data from level 2 activity (buildings)		
Code	Response	Field notes
Reassurance and safeguards	<i>'Maintenance would be important'</i>	<p>These responses were given by participants who had positive attitudes towards solar panels and other renewable energy technologies .</p> <p>Whilst participants were keen to take up low-carbon offerings, these comments demonstrate concerns around the introduction of new technologies into their homes.</p>
	<i>'Would need a guarantee'</i>	
	<i>'Roof would have to be guaranteed'</i>	
Cost	<i>'Motivated by cost of living'</i>	<p>A common theme across the engagements was the energy price crisis. This context meant that cost was cited as both a barrier to uptake of low-carbon measures as well as a motivation to take up these solutions. Several participants were conscious of the tension between both the cost of taking up low-carbon measures and the cost of not taking them up.</p> <p>Some participants were also conscious that, even with removal of upfront cost, retrofitting represented a significant debt burden. Some participants outlined when they would be happy to take on debt and how long they would be happy for repayment periods to last.</p>
	<i>'Once I've paid off my mortgage'</i>	
	<i>'15-year payback period'</i>	
	<i>'10-year payback period'</i>	
Governance	<i>'Council should pay for solar power'</i>	

	<i>'Need to change how energy is managed'</i>	<p>Participant discussions of energy governance mostly centred on more top down, centralised forms of energy management.</p> <p>Both local authorities and central government were seen as key players in a more planned energy economy (including covering the costs of the energy transition for end users), with current private energy markets being seen as too difficult to coordinate/regulate and this being a contributing factor to energy price crisis.</p>
Practicalities	<i>'Roof space is small'</i>	<p>These comments were given by participants who had positive attitudes towards domestic low-carbon solutions but represent concerns about introducing new technologies into the home, relating to both their own home and to scepticism about some aspects of the new energy system. These included doubts about the amount of energy solar PV could produce (owing to small roof space to fit an array) and concerns about how long technologies will last before replacements are needed.</p>
	<i>'Batteries don't last'</i>	

Participants attitudes towards domestic low-carbon solutions were overwhelmingly positive. The significant amount of appetite for domestic retrofitting was motivated largely by the prevalence of the energy price crisis in the news at the time. Participants' readiness to adopt low-carbon measures was mitigated by concerns around the installation of new technologies in their homes, demonstrating a need to improve understanding around the technologies. This also highlights the

challenge of changes required by individual decisions made in people's own personal space. Whereas the focus on top-down approaches by some may indicate a lack of willingness to assume individual agency.

6 Artisan Market pop-up event (July 2022)

Keele University and New Vic Borderlines staged a pop-up engagement in July 2022 as part of the monthly Artisan market in Rugeley town centre. The engagement ran activities 2,3, and 4 in same way as the Jubilee Street Party. Activity 1's '70 years of energy' framing was made specifically in the context of the Platinum Jubilee, so was omitted from this pop-up event, meaning that there was only one level 1 activity. Alongside generating insights to feed into the ZCR consortium, the aim of the pop-up activity was to increase the visibility of the ZCR project, promote upcoming ZCR events, as well as build a contact list for members of the public interested in continuing engagement with the project. This section outlines the data collected in detail. It includes analysis and coding of data collected to feed insight from the engagement back into the wider consortium.

6.1 Results and findings

6.1.1 Quantitative data (Activity 2)

Table 5 outlines quantitative data gathered as part of the 'buttons in jars' activities. 24 participants were engaged across the day, with participants engaging to different degrees with different levels of activity.

Table 5: Quantitative data from the Artisan Market engagement.	
Total number engaged: 24	
<p><i>Q1) Where energy comes from is changing again to help us reach net-zero. What would you rather change about your life as part of the transition and why?</i></p>	Change my home: 3
	Change travel: 3
	Change both: 4
Total answers: 10	
<p><i>Button Question 1:</i></p> <p><i>Would you be more likely to retrofit the fabric of your</i></p>	Change Fabric: 0
	Technology: 4

<p><i>home, change the technology in your home, or would you want to do both? Why?</i></p> <p>Total answers: 6</p>	
	Change both: 2
<p>Button question 2:</p> <p><i>If you could give up your car, would you want to? Why?</i></p> <p>Total answers: 8</p>	Yes: 5
	No: 3

6.1.2 Qualitative data

The following section outlines the qualitative responses gathered from participants. It considers each activity in turn, outlining coding of responses which has been undertaken by researchers. The data are pooled from written responses participants gave on blank cards as part of activities, as well as from field notes taken by the researcher.

6.1.2.1 Activity 1 - Energy transition

In contrast to the Jubilee event, engagement at the Artisan Market was run without the ‘70 years of energy’ framing and therefore without the level 1 activity on the energy transition. However, during engagement some participants did comment on the energy transition. These comments were tangential to discussions around buildings and mobility and are coded below as comments on energy transitions themselves, the motivations for energy transition and positive and negative perceptions of low-carbon solutions (table 6).

Table 6: Qualitative data from Artisan Market (energy transition)		
Code	Response	Field notes
Transitions	<i>‘Centralisation of schools and hospitals has isolated Rugeley.’</i>	Comment was made as part of discussion facilitated during level 2 activity on mobility.

		Participant was highlighting the centralisation of schools and hospitals in the district (Cannock) as a change that has created mobility problems for Rugeley (i.e., less need to run bus services through the town).
Motivations	<i>'Interest in renewable because of kids.'</i>	The deferred benefits of energy transition for future generations were a common theme for participants across events.
	<i>'Want to retire so looking at ways of reducing energy costs.'</i>	Cost on the other hand was the most common motivation for energy transition where, particularly in the context of the energy price crisis, participants highlight an appetite to reduce energy costs where possible.
Solutions (positive)	<i>'Canals need fixing to protect heritage.'</i>	Heritage is a common and important theme that emerges from engagement in Rugeley. Participants often express a desire to protect heritage through any energy transition.
	<i>'Use more electric.'</i>	Participant demonstrated good understanding of energy transition and expressed a desire to see more domestic electrification alongside decarbonisation of the grid.
	<i>'Renewable energy should be easy in England.'</i>	Participant expressed frustration at the relative lack of renewable energy production in England, offering wind as a solution based on weather conditions.
Solutions (negative)	<i>'Community energy: people in deprived areas can't pay.'</i>	Scepticism around community energy in this instance is focussed on cost and a concern that it will only benefit the able-to-pay demographic.

As with the Jubilee Street Party event, participants were broadly positive about the energy transition in their lives with negative attitudes based around concerns over the ability for lower income communities to access low-carbon solutions. Again, the motivating factors for people engaging in the energy transition were based around an appetite to reduce energy costs and for the benefit of younger family members.

6.1.2.2 Activity 3 - Mobility

This section presents data collected as part of the level 2 activity on mobility. Responses (table 7) are coded as relating to public transport and private car ownership, though sub-coding as positive and negative attitudes to these modes of transport was not sufficient as data gathered was overwhelmingly negative in both cases (facilitators specifically asked participants for any negative perceptions of private car ownership). Instead, sub-codes include “time” and “cost” as above, as well as responses relating to “EVs” and “comfort”.

Code	Response	Field notes
Public transport (time)	<i>‘Poor regularity of public transport.’</i>	Participant identified the daily work commute as the journey they made most often and cited the lack of regular train services between Rugeley and Stafford as the reason that they made the journey by car. It is of note that during the engagement facilitators discovered that trains between Rugeley and Stafford are hourly, but that this was still viewed as insufficient.
Public transport (comfort)	<i>‘Avoid busy public transport’</i> <i>‘No conductor on bus/train. Don’t feel safe.’</i>	Comfort was framed both in terms of physical and emotional comfort. This included physical discomfort of crowded public transport but also emotional discomfort in large crowds and in unsupervised trains.

Private car ownership (comfort)	<i>'I'd want someone else to drive me around.'</i>	When asked directly if there were any downsides to private car ownership, participant stated that it would be better if someone else could drive them around. This again offers the framing of luxury as a lens through which to understand the benefits of low-carbon mobility solutions to the Rugeley community.
Private car ownership (cost)	<i>'Don't like the cost of fuel.'</i>	As above, participant responses were given in response to a direct provocation by facilitators to consider any negatives of private vehicle ownership.
	<i>'Cost of fuel a negative.'</i>	
Private car ownership (EV)	<i>'EV battery disposal.'</i>	Participants demonstrated a scepticism toward EVs based on the materials used in their production and their disposal.

Whilst participant responses were similar thematically to the Jubilee engagement, facilitator provocations to illicit any negative perceptions of private car ownership proved useful in understanding potential motivations to adopt low-carbon transport solutions, although highlights the necessity of financial incentives of using public transport – an area which is currently considered as a barrier (Jubilee Street Party data).

6.1.2.3 Activity 4 - Buildings

Table 8 presents data collected as part of the second level 2 activity, buildings. As with data gathered at the Jubilee Street Party event participant responses are coded across 'governance', 'cost' and 'practicalities'. For this engagement however, participants' considerations of the practical implications of adopting low carbon solutions were based around negative perceptions of the solutions (so were a demotivating factor) whereas in the Jubilee engagement participants (though expressing negative perceptions) were broadly positive about retrofit solutions.

Table 8. Qualitative data from Artisan Market (buildings)		
Code	Response	Field notes

Governance	<i>'People want it but won't go for it themselves.'</i>	Both participants' responses relate to a perceived appetite in the community to take-up low carbon offerings for buildings. Participants shared the point of view that without central government funding cost was too significant a barrier even for the able to pay demographic, highlighting a perceived lack of agency amongst homeowners.
	<i>'Needs central investment (government)'</i>	
Cost	<i>'Cost/Benefit doesn't add up. Would rather wind.'</i>	Participant was commenting on a perception of solar PV as only lasting a short amount of time comparative to the cost and viewed wind as a better option.
	<i>'On benefits so can't afford.'</i>	Highlighting cost as a barrier.
	<i>'Cost savings felt by able to pay.'</i>	Participant commented on a perceived injustice with the roll out of energy saving measures to able to pay demographics as this group are most able to afford rising energy costs.
Practicality	<i>'Solar panels only last so long'</i>	The perceived short life of solar PV was a common objection across engagement activity.
	<i>'Heavy metals need disposing of'</i>	There is a common perception across engagement that the materials of low-carbon measures have negative impacts on the environment.
	<i>'Too old to think about doing that now'</i>	Participant saw the repayment period as unworkable at their age.

In contrast to the Jubilee engagement participants' attitudes towards domestic low-carbon solutions were less unequivocally positive. A significant degree of scepticism is evident in the responses above primarily centring on the likelihood of community members adopting domestic energy solutions with their own money and perceived negative impacts of solar PV and EV materials on the environment. Again, this demonstrates a need to improve understanding around domestic low-carbon measures.

7 Rugeley Eco-Day (April 2022)

The Rugeley Community Church and Centre hosted an 'Eco Day' event in April 2022 bringing together local groups who focus on sustainability. The aim of the day was to encourage networking between local groups and connect with the community. Given that the event was focused specifically on sustainability, level 2 activities were chosen as the appropriate engagement method under the assumption that attendees would be willing to stop and chat. Engagement focused upon Mobility, Mobility Hubs, and Community Energy, posing key questions to attendees about each topic using a Monopoly Board (figure 3) to collate responses throughout the day.

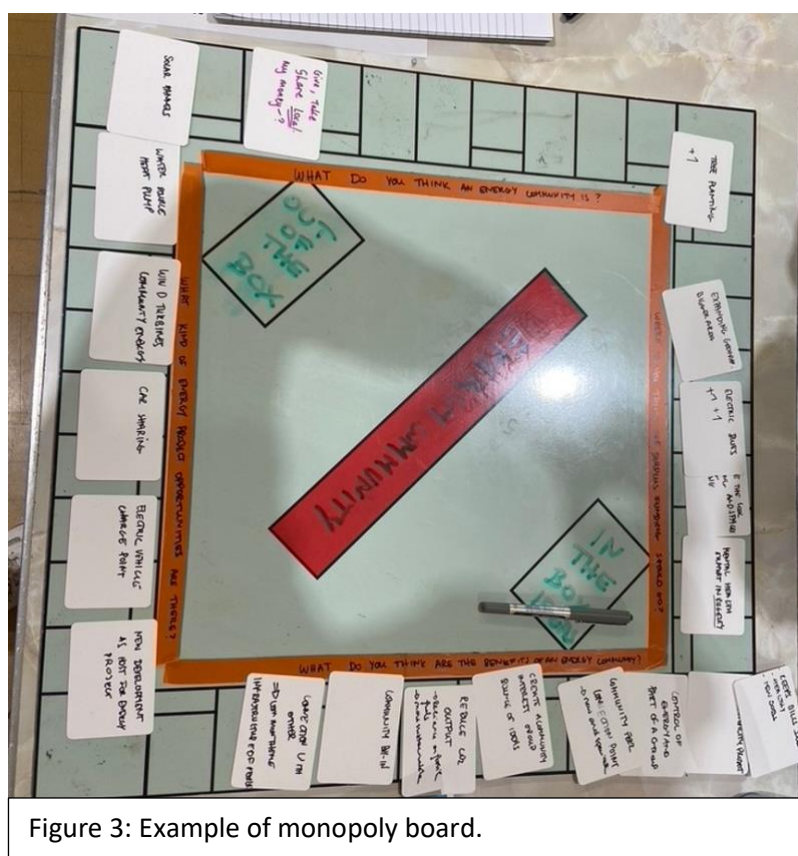


Figure 3: Example of monopoly board.

7.1 Mobility

Key questions presented to attendees regarding mobility included: 1) Where do you travel to? 2) How do you currently travel? 3) How could travel be improved? 4) How would you use an automated bus? 5) What are the barriers to Active Travel? Responses to questions about mobility in Rugeley largely focused upon the infrastructure of transport in Rugeley. There were a number of complaints

about the existing bus service, with several attendees raising issues with the lack of service to the train stations in Rugeley, and out of Rugeley. Furthermore, attendees felt that Rugeley was not designed to encourage active travel. The results are presented in table 9.

Table 9: Mobility responses.	
Question	Response
Where do you travel to?	<ul style="list-style-type: none"> - Town centre on a weekly basis. - Community Centre on a weekly basis. - Further afield to Shropshire, London, Southeast.
How do you currently travel?	<ul style="list-style-type: none"> - Cycling for leisure and holidays. - Mixed modes of transport, walking, cycling and car. - Car due to limited mobility.
How could travel be improved?	<ul style="list-style-type: none"> - Connect bus and train timetable, no bus to Cannock Chase or visitor's centre. - Reintroduce the Stafford to Rugeley bus service. - A good bus service to get cars off the road, it would generate a more friendly and sociable environment.
How would you use an automated bus?	<ul style="list-style-type: none"> - Needs to be consistent, reliable, and run later in the evening.
What are the barriers to Active Travel?	<ul style="list-style-type: none"> - Weather and heavy traffic. - Train footbridge not accessible at the train station. - No covered or warm waiting room at the train station a problem when there's long waits between trains.

7.2 Mobility Hubs

Key questions presented to attendees regarding mobility hubs included: 1) Preferred Hub Locations? 2) What features would you like to see? 3) Why wouldn't you use them? 4) Why would you use them? Responses generated a number of locations throughout Rugeley where mobility hubs would be preferred. There was an emphasis on mobility hubs being easy to use as well as a focus upon accessibility for disabled users. The results are presented in table 10.

Question	Response
Preferred Hub locations?	<ul style="list-style-type: none"> - Rugeley Town Train station. - Tesco x 3. - Bus Station. - Main Square. - Leisure Centre. - Premier Inn.
What features would you like to see?	<ul style="list-style-type: none"> - Mobility scooters/wheelchairs to use and leave at the hubs. - Needs to be easy to use.
Why wouldn't you use them?	<ul style="list-style-type: none"> - Wrong locations (not on common travel routes). - If they were expensive to use and not accessible.
Why would you use them?	<ul style="list-style-type: none"> - If they had mobility scooters/wheelchairs to use on an ad hoc basis.

7.3 Community Energy

Key questions presented to attendees regarding Community Energy included: 1) What do you think are the benefits of community energy? 2) What kind of energy project opportunities are there? 3)

Where should surplus funding go? 4) What do you think community energy is? Questions focusing on community energy generated a range of responses outlining the perceived benefits of community energy in Rugeley. The results are presented in table 11.

Table 11: Community Energy responses	
Questions	Response
What do you think are the benefits of community energy?	<ul style="list-style-type: none"> - Connections with others, infrastructure of people. - Control of energy and part of a group. - Keeps bills down, healthy, new jobs. - Sustainability project. - Reduce CO₂ output and reliance on fossil fuels. - Create a community interest group, bounce ideas off each other.
What kind of energy project opportunities are there?	<ul style="list-style-type: none"> - Water source heat pump. - Wind turbines. - Car sharing. - Electric vehicle charging point. - New development as host for energy projects. - Solar panels.
Where should surplus funding go?	<ul style="list-style-type: none"> - Electric buses x3. - Tree planting x2. - Mental health support in Rugeley. - Improve the look and spaces of Rugeley, cleaning, fixing, planting. - Expanding geography, bigger area.
What do you think community energy is?	<ul style="list-style-type: none"> - Give. - Take. - Share. - Local. - My Money.

8 Discussion and conclusion

In Table 12, we can see that participants largely stated a willingness/readiness to change their energy use both in their mobility habits and in their domestic energy use. Whilst in the level 2 activities participants largely demonstrated a readiness to adopt low-carbon domestic energy solutions, this willingness was not reflected in their responses to mobility activities where multiple barriers/objections to low-carbon mobility solutions were presented. Whilst these objections demonstrate the significant amount of work required to catalyse low-carbon behaviour change in mobility, they also sign-post areas where ZCR can achieve wins (i.e., the lack of public charging points creating reticence for EV use).

	Positive attitudes/perceptions	Negative attitudes/perceptions
Energy transition	7	4
Active travel	3	2
Public transport	0	11
Electric vehicles	3	6

Positive perceptions of low-carbon mobility solutions tended to be framed in terms of luxury and wellbeing. This could provide a useful entry point for behaviour change, framing the perceived “slowness” of active travel and public transport as a benefit to health and wellbeing (see slow technologies - Hallnas and Redstrom, 2001). Luxury on the other hand relates to EVs in the context of being the most modern vehicles.

A theme that emerged across different discussions was participants’ concerns about justice, equity and accessibility. These concerns referenced the need to ensure that the energy transition did not leave behind or disadvantage those who were unable to pay, ensuring that everybody, no matter their geography or circumstance were able to benefit from the transition, and that accessibility issue were at the heart of addressing some of the barriers to low carbon mobility.

It is important to note that the data presented above reflects self-reported attitudes by participants. This data set, therefore, may be limited in that there may be some issues participants were less likely or unwilling to discuss in a public setting. Some responses may also reflect subconscious

unwillingness to assume individual's own agency for change, such as emphasising the need for top-down approaches. The responses were also undoubtedly influenced by the energy price crisis which was a key topic of discussion in the media at the time of these events. Such times may provide useful leverage points for change.

The data from the engagement activities outlined demonstrate a significant disparity in energy literacy with some participants showing more nuanced understanding of energy systems and the energy transition while for others there is a prevalence of fears, uncertainties and doubts. Addressing these areas of fears, uncertainties and doubts and moving understanding away from 'traditional energy system' knowledge learnt in the past highlights this as an urgent next step in catalysing a SLES-ready community. These findings informed further stages of the Zero Carbon Rugeley project user-centric design and community engagement activities which aimed to develop understanding and capacity within the community through the development of the SLES champions training program and community exhibition materials. These activities and materials are suitable for use in other community contexts, and it is anticipated that the findings outlined in this report would provide a good starting point for the design of user-centric design and community engagement activities in other projects.

9 References

Hallnas, L. and Redstrom, J. (2001) 'Slow Technology – Designing for Reflection', *Personal and ubiquitous computing*, 5(3), pp. 201-212.