



centre for
sustainable
energy

Social dynamics and energy vulnerability:

how can attention to social dynamics
help address energy deprivation?

Case studies from CSE's work with fuel poor
households and deprived communities.

In collaboration with Cardiff University's
Understanding Risk group.

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Executive Summary

This paper was commissioned by the FLEXIS Social Sciences research team at Cardiff University to draw on the Centre for Sustainable Energy (CSE)'s experience of catalysing social innovation as a means to address fuel poverty and other forms of energy vulnerability. This was with the aim of testing out and further developing understanding of the dynamic nature of energy vulnerability.

CSE has drawn on evidence from a variety of projects spanning the last four years where the approach to engaging with individuals, families and communities has sought to catalyse changes in social relations to tackle fuel poverty or promote energy justice. The research employed mainly secondary analysis techniques, with some additional interviews conducted with front line workers. The selected projects which form the basis for case studies include advice delivery, community energy and action research projects:

- Home Visits Plus, an advice project, testing a client – advisor intervention utilising a behaviour change approach and installation of small energy efficiency measures;
- Smart and Snug, an advice project, testing a client – advisor intervention utilising extended advisor contact and personalised energy advice based on sensor/energy data;
- Warm Homes Advice and Money (WHAM), an advice service, applying a client – advisor and organisational intervention with advisors acting as a single point of contact for clients to receive support from multiple specialist providers, working in a joint delivery partnership. One work stream has a particular focus on working within health settings.
- Energy in Schools – an action research style whole school intervention utilising smart devices, sensor/energy data and learning resources
- Powering Up – a community-focused project, testing how the use of community development interventions can cultivate community-led energy initiatives in deprived communities.

Case studies are included at the end of this report. These draw on evaluation reports, project documentation and interviews. The analysis also referenced other models of energy justice.

It was found across the CSE case studies that it was possible to conceptualise energy vulnerability as a dynamic condition in the way that has been proposed in the Cardiff University Better Energy Futures Project <http://orca.cf.ac.uk/124132/>. Six considerations in the wider context were identified in the Cardiff University Flexis Social Sciences Team report which can aid an understanding of fuel poverty: instability and uncertainty; social relationships; multiple meanings of 'budgeting'; adapting to changing circumstances; dealing with technology; the importance of place. The CSE case studies strongly echoed the influence of instability and uncertainty, social relationships and technology on fuel poverty. Multiple meanings of budgeting did not emerge as a strong theme, reflecting an underlying experience-based assumption amongst CSE advisors that budgeting very often means 'coping', including in persistent or worsening crisis. The importance of place emerged most strongly in the community-focused Powering Up case study.

Key points that emerged across case studies were:

- A trusted ongoing relationship (without creating dependency) is instrumental in increasing the stability of the client's situation, building their confidence and capabilities.

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- A holistic approach (additional advisor abilities or the advisor acting as a single point of contact) can deal effectively with the complexity and interconnectedness of inhibiting factors which negatively affected a person's ability to respond to their situation of energy vulnerability.
- Sharing data via visual feedback on energy consumption and temperature/humidity and the impact of behaviour changes increases client confidence, the uptake of energy advice, and may support further social engagement for energy improvements with landlords or contractors.
- Within schools, established roles and responsibilities and hierarchical dynamics can strongly inhibit action on energy. Shifting the social dynamics between managers, staff and pupils can enhance opportunities for action on energy. However, there are a range of systemic factors (e.g. policy, building fabric and technology) that also inhibit action.
- In deprived communities a supportive relationship can facilitate community leadership on energy issues by those already active in other ways. Other social dynamics, including carer commitments, can constrain the ability of individuals to catalyse increased engagement by others in the community. The dynamics of social capital in a place can influence how far external support is effective in catalysing community-led actions to promote energy justice.

In addition, case studies and other research suggested the following aspects as potentially relevant to improve the model:

- Examining energy use within a systemic social context, at individual, household and community level. This could include developing trust and social capital at these levels and across multicultural communities.
- Increasing the emphasis on learning capacity, integrating informal and formal learning into interventions.
- Reframing energy vulnerability as a health issue, and energy advice as a health intervention. The Covid 19 pandemic has shown how a sudden shift in social expectations, habits and practices is possible. This may suggest a radical route towards ending energy poverty, if individual and societal health are emerging as key drivers of change.
- Recognising the importance of established roles and collectivities (people with equivalent life circumstances) within social relationships, including the dynamics of how responsibilities are held and shared.
- Exploring the supply of energy services to the non-domestic sector, including to schools and communities, as well as alternatives to conventional energy services.

1 Introduction

The FLEXIS Social Science team at Cardiff University has conducted longitudinal research to produce enriched understanding of people's experiences of "being in fuel poverty" and other energy-related difficulties.¹² The group analysed data from longitudinal field work to develop a model which recognises the dynamics of energy vulnerability. Through work with the Energy Systems Catapult as part of the 'Better Energy Futures' project, these insights were used to identify principles which can help inform the design of fairer, more effective interventions to address fuel poverty.³

The FLEXIS Social Science team and Better Energy Futures

The FLEXIS Social Science team brings together researchers from the School of Social Sciences and School of Psychology at Cardiff University as part of the interdisciplinary Understanding Risk research group. The development of dynamic, temporal approaches to social research through qualitative longitudinal (QL) methods is a longstanding interest of the team⁴, who have successfully delivered the QL Energy Biographies project⁵⁶, which draws upon methodological insights from the team's earlier work as part of the QL network Timescapes. As part of their work on FLEXIS, the team is undertaking a QL interview study in a Welsh Valleys community case site, Caerau, where development of a geothermal district heating scheme using water from disused mine workings is currently underway. Fuel poverty and energy vulnerability emerged as significant issues in these interviews, which informed development of the Better Energy Futures project.

Better Energy Futures was undertaken as part of a collaboration between FLEXIS social science researchers, together with colleagues from the Consumer Insights team at the Energy Systems Catapult (ESC). It was funded by the Welsh Government, and forms part of the ESC's Fair Futures programme, providing an initial basis for future work by ESC in developing design solutions for fuel poverty. Its objective was to draw on social science research concerning people's lived experience of energy use in order to help design fairer, more effective technologically-enabled interventions to address fuel poverty. It aimed to do this by producing an enabling framework to help envision how stakeholders could use research data relating to lived experience to improve the design and development of social as well as technological innovations. To do this, the FLEXIS social science team drew on insights from their interviews in Caerau, alongside a small number of interviews with the same participants funded as part of the Better Energy Futures Project. Analysis of data explored to what extent people's accounts of energy-related challenges reflected other scholars' research findings on the nature of energy vulnerability. In particular, the analysis focused on the extent to which people described experiences of detriment brought about by inadequate access to energy

¹ Shirani, F. et al. 2017. Critical moments? Life transitions and energy biographies. *Geoforum* 86, pp. 86-92. (10.1016/j.geoforum.2017.09.006)

² Shirani, F. et al. 2018. UK smart living demonstrator (better energy futures) – research report. Cardiff: Cardiff University.

³ Groves, C. et al. 2019. Better energy futures: Developing a framework for addressing fuel poverty. Project Report. Cardiff: Cardiff University.

⁴ Henwood, K., and Shirani, F. (2012). "Researching the temporal.", in Harris Cooper, PhD (Editor in Chief) *Handbook of Research Methods in Psychology*, APA Publications, Vol 2, chapter 13

⁵ Groves, C., Henwood, K., Shirani, F., Butler, C., Parkhill, K., and Pidgeon, N. (2016). Energy biographies: narrative genres, lifecourse transitions and practice change, *Science, Technology and Human Values*, 41 (3) 484-508 DOI: [10.1177/0162243915609116](https://doi.org/10.1177/0162243915609116).

⁶ Energy Biographies –Final Report, Cardiff University/ESRC/EPSRC (2016). Henwood, K., Pidgeon, N., Groves, C. and Shirani, F. <http://energybiographies.org/newsblog/energy-biographies-final-report-available>

services. The literature suggests that such detriment can be conceived of as a loss of capabilities, i.e. the opportunities available to people to achieve a socially valued quality of life. Key questions were to what extent people found themselves vulnerable to such detriment as a result of wider 'disabling conditions', and in what ways the effects of such conditions were influenced by people's own understandings of and responses to their situation. The detailed analysis of challenges surrounding energy consumption was drawn on to inform a stakeholder workshop convened and led by ESC.

The conceptual model developed by the FLEXIS Social Science team highlights how energy vulnerability shifts between changes in circumstances between periods of instability and relative stability, affected by financial circumstances and wider social relationships. It found that how people deal with these shifts can shape whether difficulties get worse or are eased. People facing energy-related challenges can be sceptical of technology-focused solutions. Members of the FLEXIS Social Science team are interested to explore further how social innovation – where people find ways of working together, or otherwise engage with wider social relationships or social structures – can contribute to generating solutions to energy-related problems.

The Centre for Sustainable Energy (CSE) has extensive experience of both innovative approaches to supporting individuals and families affected by fuel poverty. CSE has also engaged with individuals and groups (aiming towards co-delivery) in innovative community-focused projects to address forms of energy deprivation.

This paper draws on learning from CSE's experience that have explicitly sought to catalyse social innovation or implicitly engaged social innovation to address fuel poverty or other energy justice issues.

2 Methodological approach

This study primarily employed secondary analysis techniques, drawing from a range of different forms of information produced as part of recent and ongoing advice delivery, community energy and research projects being delivered by CSE. Case studies also draw on learning and evaluative interviews, some of which were undertaken for the combined purposes of reflexive evaluation and to inform this paper.

2.1 Framing fuel poverty and energy vulnerability

The definition of fuel poverty in the UK differs for England, Scotland and Wales and these definitions change and evolve to reflect current interpretations and social contexts. In the UK fuel poverty is defined by the Warm Homes and Energy Conservation Act as: "a person is to be regarded as living "in fuel poverty" if he is a member of a household living on a lower income in a home which cannot be kept warm at reasonable cost". Wales retain the 10% definition originally given in the first UK Fuel Poverty (DEFRA 2001) that a household in fuel poverty would have to spend more than 10% of their income to maintain a satisfactory heating regime⁷. In England fuel poverty was measured using the Low Income High Costs (LIHC) indicator, which considers a household to be fuel poor if: (1) they have required fuel costs that are above average (the national median level); and (2)

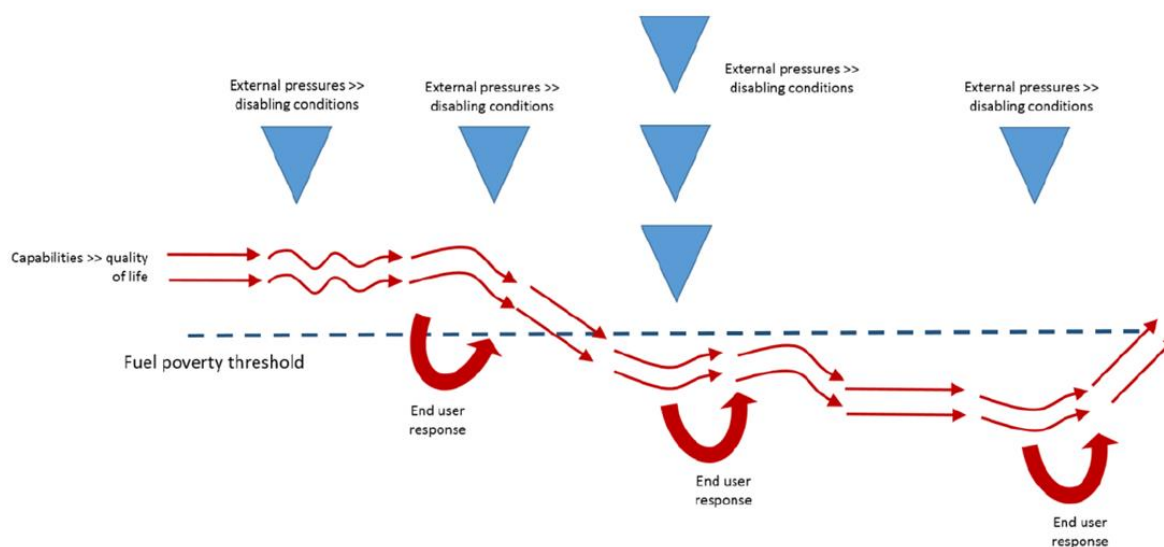
⁷ Statistical Bulletin. Fuel poverty estimates for Wales: 2018 (29.08.19) Welsh Government

were they to spend that amount, they would be left with a residual income below the poverty line⁸. A new measure, LILEE (Low Income Low Energy Efficiency) is proposed in the Government's 2019 fuel poverty strategy consultation. The LILEE measure would class a household as fuel poor if the property has a Fuel Poverty Energy Efficiency Rating of D-G, and after housing and energy costs are deducted occupants' disposable income is below the poverty line. One aim of adopting this measure is that it can reflect the dynamic nature of fuel poverty as households dip into it and rise out of it.⁹

What is common to and underlies these definitions is that fuel poverty is caused by a range of factors – mainly low income and high fuel bills which are possibly due to living in an energy inefficient home. There are, of course, other influences like external temperature, health and under occupancy which determine whether a household is adequately heated.

The FLEXIS Social Science team's conceptual model as set out in the Better Energy Futures report (<http://orca.cf.ac.uk/124132/>) views fuel poverty as an inability to afford adequate energy services. It recognises the importance of external pressures as 'inhibiting conditions' that 'make it harder for households to avoid spending so much of their income on energy that they then have insufficient income to maintain a decent quality of life, or indeed make it impossible to heat homes adequately at all.' External influences can exacerbate or diminish a person's ability to be able to afford adequate energy services. The model also recognises that end user responses will influence their capabilities and ultimately their quality of life¹⁰. This is visualised in Figure 1:

Figure 1 Conceptualising energy vulnerability as a dynamic condition



⁸ Annual Fuel Poverty Statistics in England, 2019 (2017 data), BEIS

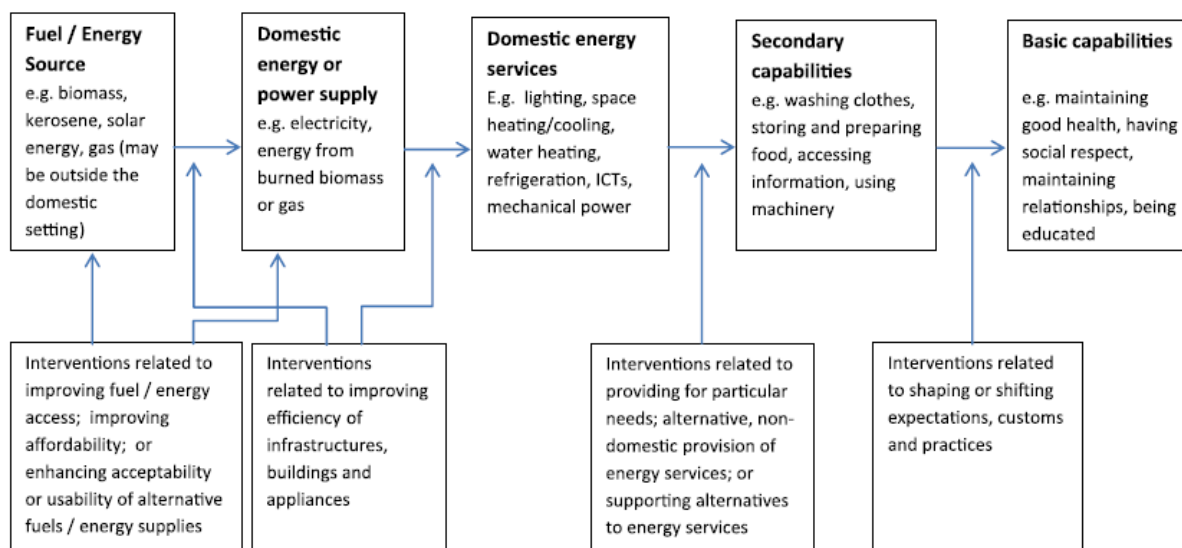
⁹ UK Fuel Poverty Monitor 2018-2019, NEA 2019

¹⁰ Groves, C., Shirani, F., Pidgeon, N., Cherry, C., Thomas, G., Roberts, E., Henwood, K (under review), 'The bills are a brick wall': narratives of energy vulnerability and adaptation in South Wales. *Energy Research and Social Science*

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The term ‘capabilities’ is a concept from Sen and Nussbaum¹¹, which has been used a little in the energy sector. Basic capabilities which include maintaining good health and maintaining relationships, having social respect and learning/being educated are dependent on secondary capabilities like washing clothes, creating meals, accessing information and using tools/equipment¹². Interventions of various types can alleviate energy poverty at different stages in the process from energy source to achieving primary capabilities (Figure 2).

Figure 2 Positioning of interventions relative to energy poverty alleviation¹³



For example an energy advisor might help a client by helping them replace a coal open fire with a heat pump (access a better fuel supply), give information about grants for free insulation (improving the building infrastructure), offer guidance on effective use of their new heating controls (achieving secondary capabilities effectively) and share energy advice on laundry practices and healthy home temperatures (achieving primary capabilities effectively). An advisor may also act to increase a client’s income by helping them to switch to a cheaper tariff. The client will then find domestic energy services more affordable, allowing them to heat their home, and so maintain their health. Even in this example, there is a form of social innovation, in that the relationship with the advisor helps the client change their response to external factors affecting their ability to heat their home (cost of energy supply) and change their relationship with their energy supplier. So hopefully the client feels more confident about how to use their heating controls and responds by adjusting their heating settings and their choice of energy tariff (rather than previously using thermostat as ‘on/off’ and of avoiding contact with their energy supplier).

¹¹ Saigaran, N.G., Karupiah, P., Gopal, P.S. (2015) The Capability Approach: Comparing Amartya Sen and Martha Nussbaum. Conference paper, August 2015, USM international conference on Social Sciences (USM-ICOSS)

¹² Day, R., Walker, G., Simcock, N. (2016) Conceptualising energy use and energy poverty using a capabilities framework. Energy Policy 93, pp 255-264

¹³ Day, R., Walker, G., Simcock, N. (2016) Conceptualising energy use and energy poverty using a capabilities framework. Energy Policy 93, pp 255-264

The FLEXIS Social Science team’s research as part of the Better Energy Futures project identified six wider social contexts that operate in peoples’ lives which can act as enabling or inhibiting factors to fuel poverty (Table 1):

Table 1: Considerations for interventions: understanding fuel poverty in the wider context

Consideration	Examples
Instability and uncertainty	Changes in income, unplanned expenditure, responding to pandemics or weather-induced crises
Social relationships	Difficulties with landlords, caring responsibilities, readiness to aid others in the community
Multiple meanings of ‘budgeting’	It can mean saving across the year or ‘just managing’ week to week
Adapting to changing circumstances	Active improvement to circumstances, or negative experiences such as ‘lowering one’s sights’, or feeling forced to trade off some values against others
Dealing with technology	Experiences of unreliability and/or limited utility of smart meters, digital exclusion
The importance of place	Local history provides examples of stable and reliable relationships that helped protect against energy vulnerability

These considerations as potential strong influences on energy vulnerability and the positioning of interventions were borne in mind in the selection of projects to develop as case studies, in devising questions for interviews and in case study write up.

2.2 Use of model of energy vulnerability

The FLEXIS Social Science team’s capabilities and energy vulnerability model informed the questions asked in interviews conducted with CSE staff. For example, interviews focused on:

- How relationships start and then develop over time, primarily with clients but also with co-workers from other organisations
- What factors facilitate useful outcomes for fuel poor households particularly around capabilities, and what don’t?

Project delivery staff have lots of different clients or work on several projects, and their normal reporting requirements to funders are about achieving against objectives, with measurable output targets. Reporting on the process is not the primary consideration of this conventional reporting. However, several of the projects included set out to trial innovative interventions and so there was a greater motivation to capture process learning. This research was opportunity to overcome a dilemma in the conventional model of funded projects for learning – namely a tendency for frontline staff to develop considerable tacit knowledge and readings of what is going on but get little encouragement to ‘see’ transitions of how social dynamics change. This was probed in interviews

with project workers. Nevertheless, it is a limitation of the study that project workers can't wholly know how social dynamics change with clients or participants. A further limitation is that this project was only able to draw on limited existing evidence from the point of view of clients or participants, drawing on project records, including interviews conducted for evaluative purposes.

Case study preparation and associated analysis was guided by the FLEXIS Social Science team's capabilities and energy vulnerability model (Figure 1, Table 1). See Appendix A for the case study guidelines and template.

2.3 Approach to evidence selection

The research team identified a range of projects that it delivered or co-delivered in the last 4 years that were relevant to examination using the energy vulnerability and capabilities framework. The primary aim of these projects was to explore in various ways how best to 'make a difference' with households in fuel poverty or in deprived communities. The team reviewed and confirmed the available evidence and opportunities for new primary evidence collection with project managers and delivery staff. This was to confirm suitability of project cases and availability of data, options for timely collection of new data, checking permissions for reanalysis of existing data and agreement to participate in interviews.

The selected projects which form the basis for case studies include advice delivery, community energy and action research projects:

- Home Visits Plus, an advice project, testing a client – advisor intervention utilising a behaviour change approach and installation of small energy efficiency measures;
- Smart and Snug, an advice project, testing a client – advisor intervention utilising extended advisor contact and personalised energy advice based on sensor/energy data;
- Warm Homes Advice and Money (WHAM), an advice service, applying a client – advisor and organisational intervention with advisors acting as a single point of contact for clients to receive support from multiple specialist providers, working in a joint delivery partnership. One work stream has a particular focus on working within health settings.
- Energy in Schools – an action research style whole school intervention utilising smart devices, sensor/energy data and learning resources
- Powering Up – a community-focused project, testing how the use of community development interventions can cultivate community-led energy initiatives in deprived communities.

2.4 The case study projects, evidence collated and additional interviews

The evidence and information sources used for each case study are described in Table 2.

Table 2: Case study evidence and additional interviews

Case study	Project dates	Evidence	Additional interviews?
Home Visit Plus	2018-2019	Evaluation report, data from participant interviews, advisor feedback session	No
Smart and Snug	2018-2019	Evaluation report, data from participant interviews, advisor feedback session, website	No
Warm Homes Advice and Money	2017 - 2021	Mid project report, case studies, interviews with advisors with focus on experience of supporting clients	Three caseworkers
Energy in Schools	2018 -2020	Evaluation reports based on interviews with participants and online survey, project notes, website	No
Powering up	2016 – 2020	Learning log, blog, project evaluation.	One project worker

Additional interviews were conducted where project evaluation reports were not yet available. Interviews were used as reflective learning spaces for caseworkers and to inform project process. For WHAM the experience of supporting clients for an extended time was explored as particular relevance to the dynamic interpretation of energy vulnerability employed.

Interviews were not conducted for other case studies where evaluation reports were already available and where the researcher themselves had direct experience of the project, and so could reinterpret their experiences through the capabilities and energy vulnerability framework lens. Adopting this new perspective to reflect on the work was found to be rewarding and insightful.

Interviews were audio recorded and then transcribed.

2.5 Analysis and write up

CSE developed a case study template to give a consistent approach to presentation of project results and overall reflections. The template integrated use of Cardiff University's vulnerability and capability framework, and concluded with any recommendations on refinement of the framework and its usefulness as a way of thinking about the role of social innovation in addressing energy issues (see Appendix A).

Interview transcriptions were analysed with reference to the capabilities and energy vulnerability framework and the case study structure. Analysis only focused on project impacts on the intended primary beneficiary of the project. For instance, the WHAM project caseworker based in hospitals expressed surprise at the significant demand from hospital staff for WHAM energy and other advice services, but this has not been included in the case study.

3 Discussion

Learning points from across all case studies are discussed below with reference to the capabilities framework and its application in understanding fuel poverty and formulating possible interventions to end it.

3.1 Use of capabilities framing

The capabilities framework describes an individual's capacity to take action towards achieving primary and secondary capabilities. The majority of case studies were based on interactions with individuals, as energy advice frequently involves discussion with one person within a household. In some instances (school, community-based initiatives, and for energy advisors) where different capabilities are involved (e.g. capability to evaluate the impact of energy advice using data and client feedback) the relevant capability is identified and the individual or group's ability to take action towards achieving the capability commented upon.

The capability framing, particularly including current intervention points to address energy poverty (Figure 2) was found to be a useful tool to explore intervention options and potential impacts on fuel poverty.

Where advice and support was provided to individuals (WHAM, Home Visits Plus, Smart and Snug) these programmes predominantly assisted people whose lives were complex and challenging due to personal circumstances and external factors. Stress impaired their basic capabilities for living healthily (strongly influenced by the capability to heat the home) and the ability to retain new information and learn new practices. Clients are better able to assimilate behavioural energy advice once an energy advisor has directly addressed immediate presenting problems (e.g. fuel debt or improving the heating system) on behalf of the client. This first step in engagement frequently addresses a systemic problem (energy affordability or built infrastructure, to the left hand side of Figure 2) which may involve difficult and extensive negotiation with third parties that the client may feel unable to cope with alone. Disengagement with the energy market was identified across all case studies, not only amongst fuel poor and vulnerable households but also amongst school business managers in the Energy in Schools case study. Some individuals experienced limited or no internet access as a barrier to engaging with the energy market - advisor support can overcome this barrier.

By successfully resolving the client's immediate presenting problem, advisors create a foundation of trust and confidence which enabled them to surface, explore and resolve other issues. Vulnerable people need extra support to assimilate energy advice and to act on it. The bridge of an ongoing supportive relationship is important. For the most vulnerable clients (as with WHAM and hospital discharges) having a single point of contact with the advisor makes it simple for the client. It can establish a sense of stability and take the pressure off people to have to manage multiple relationships.

Longer term client support which also nurtures the relationships capability can result in the client's situation becoming increasingly stable, establishing confidence in their own ability to take further actions themselves. As noted in the WHAM case study, there is a fine balance to be found by the advisor to avoid creating dependency: good timing is needed within the advisor-client relationship

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to jointly share the ability to deal with things and shift this gently towards the person taking on more (when appropriate), developing their capacities further.

The Home Visits Plus case study illustrates where one intervention worked and another didn't. Where an advisor could facilitate the installation of small measures that improved comfort in the home this was valued by the client. Where the advisor could install a small measure themselves or had the connections/resources to bring in trusted trades people/a housing association for repairs, this could overcome client inertia to action this themselves. In contrast Motivational Interviewing (MI) techniques had limited discernible effect on householder behaviour. MI builds on the strengths of the client and is generally (but not exclusively) used over a number of sessions. It may be that MI wasn't effective in this project because:

- A trusting relationship hadn't been established, and wasn't ongoing;
- The person wasn't yet motivated to or confident in making behavioural changes;
- The person had a dependency mindset which blocked their ability to change; and/or
- The advisors skills in MI needed more practice to be effective.

Advisor knowledge of or relationships with trusted trades people and grants for building improvements are an acknowledged and predominant feature of energy advice which was seen across all case studies. For example, in Energy in Schools a primary school was able to save £525 on its electricity bill through an LED lighting upgrade, highlighted in an energy audit. Identifying the action to take and possible funding sources enabled the school to make the energy efficiency improvement with no upfront cost.

Current fuel poverty interventions therefore tend to first address more systemic external influences (energy affordability, infrastructure improvements) and depend on a social relationship for behaviour advice to be better received and adopted. For example, an energy advisor assisting an individual/organisation with a tariff comparison and switch can reduce fuel bills and build the clients' capability to do this for themselves in the future. However, the current Covid 19 pandemic shows how a radical change in social expectations – the right-hand side of Figure 2 - can drastically impact on habits and practices around energy services. When the immediate presenting problem shifts to relate to the primary capability of maintaining health – at social and individual levels – with strong government intervention, behaviour change isn't an option, it's a necessity. Behaviour change has occurred in the UK Coronavirus response as the immediate threat is perceived to be great, the threat and the demand for behaviour change is applicable equally to all (and is perceived as equitable), and feedback on the impact of the pandemic is known and regularly updated. Observing this may be useful in future energy poverty interventions in emphasising achievement of the primary capabilities as urgent and important at multiple levels. Tailoring advice to directly appeal to a person's values and what is currently of uppermost importance to them can help to make advice stick.

A disjuncture noted in most case studies was of people's limited comprehension about effectively achieving secondary capabilities (e.g. cooking, heating) related to two aspects, use of technology/appliances (e.g. heating systems) and feedback on the impact of using them (e.g. temperature, energy consumption). In Smart and Snug clients' low energy literacy impacted on their capability to heat their homes, compromising primary capabilities of health and social relationships.

Client capability to heat was also often influenced by self-concept (e.g. of 'being hardy'). The extra cost of heating could create 'trade off' situations such as for food, social contact, or accessing services. Alternatively, having personal temperature and energy cost information on the use of specific heaters (a lounge panel heater was found to be ineffective in heating the room) made heating choices possible and their impact verifiable. This increased comfort without compromising primary capabilities.

Similarly secondary capabilities to achieve affordable energy services through temporal changes to energy use for people on Economy 7 increased with visual feedback and advisor help. For instance the cost of heating hot water in an immersion tank was easy to compare on day and night rates. Changing the water heating time didn't necessitate a change in client behaviour. In Energy in Schools the capacity of schools to shift electricity use out of peak time (4-7pm) was explored in relation to a hypothetical time of use tariff as a way to reduce fuel bills. Again visual feedback for the whole school was found to be a strong enabling factor, along with an interschool competition.

The capabilities for pupils/staff to effectively heat the school to maintain good health improves with feedback on temperature and energy use via a website, and with information on recommended healthy temperatures for schools. The Energy in Schools case study found that site managers had variable capability to effectively heat school buildings (for various reasons). Real-time data from sensors and energy monitoring could help identify issues and trigger actions to remedy them. Teachers' ability to educate pupils (and themselves) about climate change and energy issues in a practical action-orientated way improves by having access to learning resources, training and ongoing tech support. The combination of effective and timely use of technology and appliances, feedback on actions and ongoing support are a potent blend to combat energy waste and fuel poverty.

In schools and homes perceived roles can also influence the secondary capability for heating in particular. In schools the business manager and site manager controls the Building Management System. Pupils and teaching staff have limited freedom to adjust heating or ventilation. Teaching staff instead resort to using portable heaters and desk fans to achieve heating or cooling in the classroom.

3.2 Dynamics of external disabling factors and the 'user response'

When households are out of an immediate crisis the inability or unwillingness of some households to try small lifestyle changes can benefit from some 'external verification'. The Smart and Snug project found that when advisors could show charts of people's actual energy consumption and relate that to their home's temperature and humidity, this could provide compelling evidence of heating issues, or the cost of unhealthy or ineffective heating practices. The use of technology to give feedback on the impacts of secondary capabilities and inform personalised energy advice gives households an extra push of ownership and responsibility. This needs to occur within a supportive setting.

Similarly the Energy in Schools project utilised energy and temperature data to give feedback to building users in schools. Ownership and responsibility play a huge role in whether data – even when digested by an energy advisor into achievable energy reduction actions – are likely to be implemented. Responsibility can be labelled to be 'pupil-led' and actions then side-lined by busy management staff. In one school significant gas waste was detected by pupils during holidays but

this was ignored by the business manager. This highlights the need for all building users to be working towards a common goal of reducing energy waste, otherwise user responses are ineffective and potentially demoralising. This requires an openness of senior staff to challenge energy myths and prioritise energy actions based on data. In this instance timing was a major factor (the time needed to upgrade the heating system – not in winter), although this energy waste problem was not a new one.

This raises a question of how best to intervene in a situation where basic capabilities are being met. Social relationships and social norms appear to be major factors which can exacerbate or diminish energy vulnerability and energy waste. Intervening in a way to change what constitutes socially respectful behaviour may offer a way forwards –by redefining what is needed to achieve that basic capability of social respect. In an educational context Busch et al (2019)¹⁴ found that to inspire action on climate change, learning activities need to focus on social norms (an enabling culture for action, or what is socially acceptable) and efficacy (the confidence in one's ability to take action). Similarly, Hilary Cottam states in Radical Help that 'relationships are key' and:

*'Change happens when there is a shift in the dynamics of power. Relational workers modelled this shift: they supported a process of development, taking care not to build dependency. Through the practice of reflection, workers guided participants to see what was needed and then supported the action.'*¹⁵

This echoes two issues that WHAM caseworkers highlighted: firstly that people are reticent to share their difficult situation with an energy supplier so do not ask for help; and secondly of the need to find a balance between support and dependency (as already discussed). The approach used in WHAM and Home Visits Plus – engaging with the client and then identifying an action plan with them – reflects the supported action mentioned by Cottam.

People's reticent response in asking for help may be influenced by having other priorities but equally may be informed by 'just getting by'. They may put up with what will work at the time, satisfying their immediate need rather than optimising for what would work best in the long run. For example, someone may put up with having a prepayment meter when they move into a new home, or may not check for a cheaper energy tariff. This response can be challenged in the context of a trusted relationship.

Similarly, if the cost of energy isn't a pressing issue, for example where it is included in with the rent, people may not be vigilant in their energy use and may waste energy. The landlord agreement mitigates against positive energy behaviours. In contrast, where pupils were being given responsibility to take action on energy, this had a positive knock on effect on their general school performance and increased their confidence.

Overall schools' capacity to model 'energy efficiency and sustainability' was poor. School business managers' freedom to explore energy efficiency measures and renewables was inhibited by time

¹⁴ Busch, K., Ardoin, N., Gruehn, D., Stevenson, K. (2019) Exploring a theoretical model of climate change action for youth. *International Journal of Science Education*. 41, 17 p2389-2409

¹⁵ Hilary Cottham, *Radical Help*. How we can remake the relationships between us and revolutionise the welfare state. Virago Press 2018 p206. This book documents experiments with social innovations utilising a capabilities framework and relational support workers in varied contexts and communities.

poverty, lack of information, little adoption of recommendations in the Display Energy Certificate report, and in having no energy budget against which to assess potential savings. Most schools had not had an energy audit done to identify, prioritise and quantify the potential impact of building improvements. Most schools were unable to implement measures if upfront costs were involved. Worryingly business managers did not recognise this lack of energy opportunities for their school (e.g. the potential to cut fuel bills by checking energy tariffs) which is so available in the domestic sector. Energy in Schools identified the need for advice for schools on this. Primary schools also have limited staff time for IT and facilities management.

At a community level the capacity in a community for individuals to take action on energy may increase and manifest in unanticipated ways. In Powering Up where communities were supported to initiate their own community energy initiatives one impact was to raise awareness of energy as an issue in one town. The local authority recognised the neighbourhood as being active on environmental issues and included in a community vote on where to allocate resources an option to install solar PV on social housing in the area. The area voted for this option. Neighbourhood participation in energy occurred by indirect action via the council rather than in the 'anticipated' way of empowering people to take direct action. The community opted for this influenced by external disabling factors residents were experiencing (caring commitments, health issues).

3.3 The wider context

The FLEXIS Social Science team's longitudinal research identified six wider social contexts which can act as enabling or inhibiting factors (Table 1): Instability and uncertainty; Social relationships ; Multiple meanings of 'budgeting'; Adapting to changing circumstances; Dealing with technology; The importance of place.

It has already been noted how the support of an ongoing relationship, particularly with an advisor acting as a single point of contact can increase stability in a client's life. This can increase the client's confidence and their sense of agency. Social relationships emerged in the case studies as important enablers or inhibiting factors to understanding fuel poverty. In Powering Up, caring responsibilities, other commitments or ill health curtailed community energy volunteering. It was hard to get 'new' volunteers. Only people already active in the community engaged over time, and their engagement wasn't consistent. People are happy to participate if something is organised, but it is a big step to initiate activities themselves.

In Home Visits Plus one client gained in confidence and agency only to be stymied in achieving further energy efficiency improvements by his social landlord, which was bound by housing regulations. He decided to move home instead. In Smart and Snug a private tenant was empowered to ask their landlord to make energy efficiency improvements, and applied for a grant for secondary glazing by using existing social connections. In Energy in Schools a business manager drew on their professional network to leverage in support and to get recommendations for contractors to install solar PV.

The enabling and inhibiting aspects of dealing with technology and technological innovation are specifically addressed in section 3.5 below.

Social dynamics and energy vulnerability

The remaining social contexts identified were not represented significantly in the case studies examined. Multiple meanings of budgeting was not explicitly asked about and did not emerge strongly in interviews. This may reflect an underlying experience-based assumption amongst CSE advisors that budgeting very often means 'coping', including in persistent or worsening crisis – such that it has become an unspoken assumption. The importance of place had some resonance in the community-focused Powering Up case study, where the historic deprivation and tendency for such places to be repeatedly subject for project attention led to some people being wary of getting involved in yet another external project seeking community involvement.

A number of other factors emerged which may be useful to pursue further in relation to possible fuel poverty interventions.

Energy suppliers' customer relationships could be orientated towards being more flexible and supportive by improving their customer ethos and staff ability to engage with vulnerable customers. Vulnerable people may not ask for help because they perceive energy suppliers as unapproachable and inflexible and they fear the possible consequences of getting in touch. Suppliers could offer greater flexibility with billing and fuel debt to reduce customer disengagement which can then curtail choices and the achievement of basic capabilities.

School business managers' ability to improve affordability of energy supply is curtailed by

- lack of smart meters
- lack of capacity to monitor energy use partly due to poor billing information and/or lack of knowledge about the metering infrastructure within the school
- lack of capacity re. switching tariff (tariff comparisons are rarely made)
- high energy costs due to unregulated broker commission fees

Changing the wider regulatory context for schools would enhance affordability of energy services e.g. the need for smart meters along with easy to digest energy reports, guidelines on environmental reporting, regulation of energy brokers and suppliers. A school's inhibited ability to access affordable energy services can have a knock on effect on pupil primary capacity for learning.

3.4 Adding in social innovation

The social innovation approach can help by:

- 1) The advisor nurturing a supportive relationship, including one of mutual learning. In Smart and Snug the social dynamic between advisor and 'client' was framed as mutual learning and research (i.e. the person was a valued participant). Trust, joint exploration and ongoing contact helped to reinforce key messages.
- 2) The advisor drawing in resources and contacts to address energy and income-related issues
- 3) The advisor acting as a conduit of new ideas and possibilities for an individual to achieve secondary and primary capabilities. In Powering Up the project supported local community workers and volunteers with training and co-facilitating events. One volunteer became the recognised person to go to for energy advice. However if no one else can commit time and energy and the social relationships are not there, then impetus is lost.

Social dynamics and energy vulnerability

Greater energy literacy and increased confidence could change relationships and roles. For example, in Energy in Schools pupils became teachers to their families on energy issues. Energy champions worked as a team with a teacher, or gave presentations to them or a technology demo to governors.

New relationships with professionals could be established that integrated services, as in WHAM. Having a social relationship with health service staff and a presence on the ward, integrating with NHS teams, makes it easier to identify patients in need. Caseworkers can ensure that patient's homes and their support needs are addressed (to achieve secondary and primary capabilities) before they are discharged.

However, it was also found that social innovations can have negative impacts if the requirements on people to engage in them result in stress. In Energy in Schools some primary schools staff were too time pressured, lacked IT support, or needed further support to engage fully with the learning resources.

3.5 The role of technical innovation alongside social innovation

A theme that emerges from two of the case studies, Smart and Snug and Energy in Schools, is the potency of combining technological and social innovations. The use of technology to increase people's understanding of how they are using energy to achieve secondary capabilities is important to identify energy waste and consider possible remedial actions. Attributing cost to energy services was important. Visual feedback of sensor/energy data (and interpretation by an advisor) was useful to bring energy consumption and the impact of energy services to life. In schools a TV screen with user friendly images was a valued tool to give feedback to the whole school on energy use. Competitions between schools were motivating. Schools were also keen on wider social comparison and to benchmark their energy use against similar schools.

Data could provide supporting evidence to be used by the advisor, or by people to back up their own engagement e.g. with landlords. For example, in Smart and Snug the electricity usage of an 1970's inefficient fridge was determined and compared to the data pattern for an equivalent highly energy efficient fridge. The difference in appliance running costs lead to the person replacing the old fridge.

In Energy in Schools the cost of gas waste over two holiday periods was identified in a secondary school. In another school pupils noted erratic heating patterns, alerted the Head and got the heating timing adjusted. One school utilised the energy data to challenge a heating myth given by a heating contractor, establishing a new informed relationship with them in the process.

Energy in Schools used Internet of Things smart sensors and devices to enable schools to become 'living labs'. The school was the real world setting for energy experiments which aimed to improve building users' ability to create an amenable learning environment. This use of technology may appeal and be appropriate in other settings e.g. safeguarding.

In Smart and Snug advisors' ability to give accurate personalised energy advice and evaluate the impact of energy advice also improved with use of technology. In Home Visits Plus the changed social dynamic with an advisor's ability to facilitate the installation of small measures was effective, valued, and could enhance a participant's ability to request further improvements to external agencies.

A lack of technology hampered Energy in Schools, a project designed to utilise smart meter data. The lack of smart meters in schools and access to smart meter data required a work around using gas and electricity meter clamps which was inconvenient to administer and impossible to implement for most gas meters. This severely reduced the ability to engage with heating monitoring and advice.

3.6 Opportunities to improve model

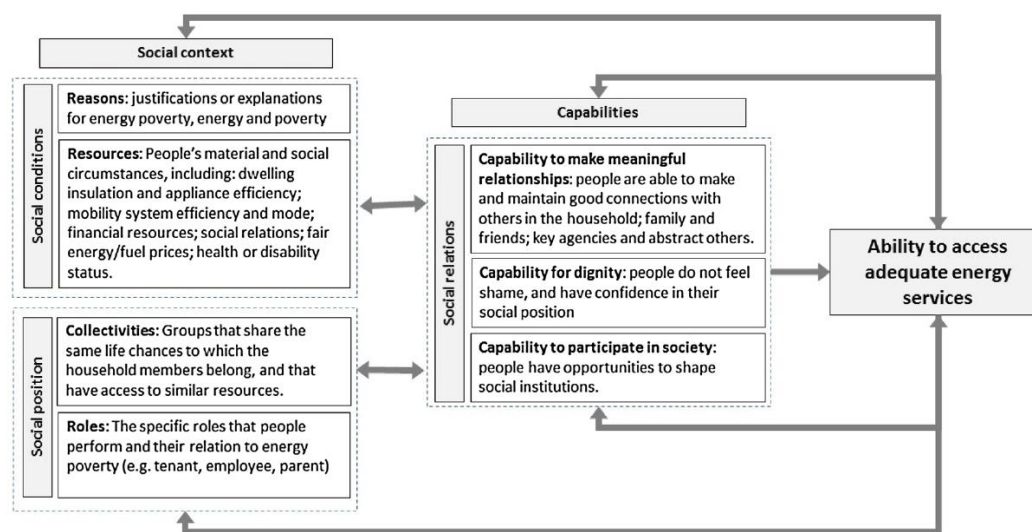
The case studies support the model's use of capability framing, the dynamic aspect of energy vulnerability with external disabling factors which push individuals in and out of energy poverty depending upon their responses. The case studies and other research point to potential ways to extend the model to better inform interventions to alleviate and end energy poverty. Figure 1 from Day et al. (page 260) is useful as a linear interpretation of stages of disabling factors, where interventions can be made to address energy poverty. The case studies illustrate where interventions at different points in this linear process can fit together in effective ways. This linear model raises a question which may warrant further exploration. Interventions to ameliorate secondary capabilities include 'providing for particular needs, alternative, non-domestic energy service provision, or supporting alternatives to energy services'. This highlights a potential bias of thinking (based on current social practices) that energy services are provided predominantly within the domestic setting. But examples even from the ubiquitous pre-cooked supermarket food to 'meals on wheels' and laundrettes/ laundry services indicate that energy services are not solely delivered within the home, and historically energy services were delivered more communally. The non-domestic delivery of energy services and alternative models to delivery of energy services would be interesting areas to explore.

One comment on this linear model is that 'Interventions to shift and shape expectations, customs and practices' is placed before achieving primary capabilities. The diagram needs to have an arrow added so that this also applies to secondary capabilities, or possibly adapted to explicitly address the **effective** achievement of those capabilities. The sense of effectively achieving secondary capabilities like heating is not conveyed, and is a key aspect in alleviating energy poverty.

Another model utilising capabilities framing is discussed and was found relevant, discussed in the Smart and Snug case study. Middlemiss et al.¹⁶ focus on the social relations capability (capability to participate in society, for dignity, and to make meaningful relationships) which influences and is influenced by social context. The model (Figure 3) conceptualising the systemic relationship between the ability to access energy services, social relations capabilities and the social conditions and positions which shape these. It builds on Day et al.'s linear model with its systemic approach. It also contends that deficiencies in an individual's capabilities (akin to 'internal disabling factors' leading to a possibly inappropriate user response) as well wider external disabling factors can lead to energy vulnerability. There is mutual conditioning and influence between individual/family and wider society. Middlemiss et al. also integrate a more familial/household approach, rather than focusing on the individual.

¹⁶ Middlemiss, L., Ambrosio-Albala, P., Emmel, N., Gillard, R., Gilbertson, J., Hargreaves, T., Mullen, C., Ryan, T., Snell, C., Tod, A. (2019) Energy poverty and social relations: A capabilities approach. *Energy Research and Social Science* 55 p227-235

Figure 3 Conceptualising the systemic relationship between ability to access energy services, social relations capabilities and the social conditions and positions which shape these.



This model only focuses on social relations capabilities; it does not include achieving good health and learning. Nonetheless the social context described could equally apply to those capabilities.

Within social context the model does contribute a useful emphasis on social position – roles and collectivities. In particular roles emerged in the case studies as having capacity to be enabling and inhibiting. Collectivities, described as groups that share the same life chances to which household members belong, is another aspect that can influence energy vulnerability worthy of further consideration. This description does not quite capture the psychological aspect of the values that a household member holds, nor of the peer group that they perceive themselves to be part of and the habits and practices associated with that group. These internal enabling/inhibiting factors greatly influence user response, condition the social relationship capability and the ability/propensity to access energy services. They also need to be factored into a systemic picture when considering interventions to reduce and end energy deprivation.

In relation to collectivities, in particular the influence of ethnic diversity, income and trust on energy poverty, Awaworyi Churchill and Smyth (2019)¹⁷ noted that in Australia ethnic diversity had a positive correlation with energy poverty. They found that trust was an important channel through which ethnic diversity influenced energy poverty, but income was not. They concluded that in a multicultural society it was important to ensure that relevant policies were put in place to support the development of social capital and trust, as a means to reduce energy poverty. Building social relations of trust and confidence at multiple levels, and meshing them together is another intervention avenue to explore.

¹⁷ Awaworyi Churchill, S. and Smyth, R. (2019) Ethnic Diversity, Energy Poverty and the Mediating Role of Trust: Evidence from Household Panel Data for Australia. Energy Economics. December 2019.

4 Conclusions

4.1 On the value of the model

The Cardiff University model conceptualising energy vulnerability as a dynamic condition and the six considerations in the wider context it specified (Table 1) provide a valuable initial guide to ascertain potential approaches and interventions to reduce and end energy deprivation. Exploring case studies using the model identified where social dynamics played a strong role within the intervention.

It was found with individuals that a trusted ongoing relationship with an advisor was instrumental in increasing the stability of the client's situation, building their confidence and capacity. The advisor requires some skill to navigate the relationship over time, giving adequate support without creating dependency.

A holistic approach could deal effectively with the complexity and interconnectedness of inhibiting factors which negatively affected a person's ability to respond to their situation of energy vulnerability. For example, when an energy advisor could improve the home infrastructure themselves (through installing small measures) or when the advisor could act as a single point of contact and draw on resources and connections to facilitate home improvements or further support for the client.

Within a stable relationship and/or expert support, adding visual feedback on energy consumption and temperature/humidity and the impact of behaviour changes increased client confidence and the uptake of energy advice. The sensor or meter data provided verifiable evidence of the current situation and could identify anomalous energy use or over/under heating. This could help overcome client inertia and habits and debunk energy myths. Data could identify and prioritise where remedial actions were required and quantify the likely financial saving. Data could also be used to support requests for assistance in the wider social context, for example with landlords or heating contractors.

In the organisational context of a school, roles could be strongly inhibiting and a change in role significantly empowering. A behavioural lens was often applied first and foremost, leaving other energy-related actions unexplored or completely in the dark. Time poverty and variable competences around use of building technologies and IT were observed. Systemic inhibiting factors related to policy, building infrastructure and technology were numerous, such as lack of smart meters, poor billing information, limited financial support for building improvements, lack of tariff comparisons and lack of regulation of energy broker and supplier commissions.

In communities a supportive relationship could facilitate greater community involvement on energy issues by those already active in their community. Further engagement was often constrained by other commitments. Without ongoing social relations within or from outside the community, activities petered out.

4.2 On strengthening the model as way to understand and address energy vulnerability

The case studies alongside reference to other research also identified a number of key learning points which could improve the model. These include exploring the non-domestic supply of energy services, and alternatives to energy services. The social positioning aspect within social relations, of roles and collectivities, merits further work. Examining energy use within a systemic social context, at individual, household and community levels would be useful areas to investigate. This could include developing trust and social capital at these levels and across multicultural communities.

Also to note is the absence of emphasis on achieving and ameliorating the learning capacity within models. Increasing a client's confidence and their ability to try new things develops over time, but only one case study that worked with individuals (WHAM) specifically includes financial competence training as part of its activities. Improvements in energy literacy happened organically within other case studies. Increasing the emphasis on learning, informally and formally with individuals would be a useful stream to integrate into interventions. (Energy in Schools was a more formal explicit intervention on improving energy literacy).

Finally, the integration of energy advice within health settings (in WHAM), in effect reframing of energy advice as a health intervention was found to be successful. Given the current Covid 19 pandemic, increasing the emphasis on the primary capability of achievement of health may provide a radical route towards ending energy poverty. The pandemic has shown how a sudden shift in social expectations, habits and practices is possible. Why not intervene and supply a basic level of energy to all to achieve the primary capability of health and well being across society?

Case study: Home Visit Plus

Home visits are an integral part of CSE's work in addressing fuel poverty and energy inequalities. The majority of home visits are with residents that experience multiple vulnerabilities which may be experienced as temporary or more permanent inhibiting conditions. CSE has trialled different approaches to the social interaction involved in home visits to explore what can help enhance client capacities.

Project approach

The Home Visit Plus project tested whether a changed social dynamic in home visit advice could help improve people's ability to maintain conditions in their home amenable to their health, and to adopt energy-wise household practices suitable to their needs. Two different approaches were utilised in these enhanced home visits. First, advisors explored a changed methodology for engagement with clients which utilised Motivational Interviewing techniques and supporting resources. Motivational Interviewing (MI) is a directive, person-centred approach which is defined as 'a collaborative conversation style for strengthening a person's own motivation and commitment to change.'¹⁸ The client talks about the pros and cons of behaviour change (e.g. smoking cessation) and shares their ambivalence to it. The 'facilitator' evokes change language in the client, reinforces it (increasing their motivation to change), then uses questions that prepare the person for change, seeks their commitment and then identifies action steps. MI is a partnership approach grounded in empathy and enablement which has been successfully used in health, social care, and addiction counselling since the 1980s. It has been tested as a conversational change technique in energy advice in relation to domestic washing behaviour¹⁹ and as a communication tool for energy managers.

The second approach that advisors used in Home Visit Plus was an enhanced capacity for advisors to install simple energy efficiency measures (e.g. radiator reflector panels, draught proofing) or to organise and pay for a trusted tradesperson to install measures or undertake minor repairs (e.g. to a broken window) in the homes of low-income or vulnerable households in the absence of available grants). Such minor improvements can address what is experienced by the resident as a significant malcontent, especially when they cannot fix the problem themselves or they cannot afford to do so.

These two approaches were combined under Home Visit Plus as research suggests that when advice and measures occur together, each form of support reinforces the effectiveness of the other so that overall more significant changes are achieved.²⁰ Taking small energy efficiency actions (such as draught proofing) can increase the likelihood of taking further actions and making wider changes to

¹⁸ A brief history of Motivational Interviewing, available at http://go9host.com/thn/images/THN_MI_Handouts.pdf

¹⁹ Conrandy, T., Kruschwitz, A., Stammering, R. (2014) Influencing the sustainability of washing behaviour by using motivational interviewing. *Energy Efficiency* 7 (2). Available at www.researchgate.net

²⁰ Rapid Evidence Assessment of "What works in changing energy-using behaviours in the home? " RAND for DECC, 2015: www.gov.uk/government/publications/what-works-in-changing-energy-using-behaviours-in-the-home-a-rapid-evidence-assessment

Social dynamics and energy vulnerability

habits and lifestyle choices. CSE was happy to install small measures in homes where clients were not able themselves for health reasons to install measures like an LED light bulb or draught proofing.

The Home Visit Plus participant group exhibited more complex vulnerability than CSE's usual home visit clients. The clients visited had multiple forms of vulnerability which created conditions that made it harder for them to achieve a reasonable quality of life: being in receipt of benefits (87%), being on a low income (62%), having a long term health condition (60%), having a disability (52%), or having a mental health condition (20%). In total, 134 enhanced home visits were delivered to 97 clients in 2017-18. Measures were provided to 45 households.

Evaluation compared client outcomes for clients who received a Home Visit Plus visit with those achieved by clients who received a CSE standard home visit. The evaluation used client records; project-specific advisor notes; follow-up interviews with clients, and notes from a reflective feedback session with 'Home Visit Plus's advisors.

End user

The Home Visit Plus visits covered a range of topics but some predominant themes emerged of participants' limited capacity for heating their home and use heating controls effectively (45%), to engage with the energy market and access affordable energy services by switching (37%), to install small measures (34%), or to engage with energy suppliers to sort out billing/metering issues (22%). 45 households reviewed small measures, but only 34 considered it the mainstay of the visit.

Whilst participants welcomed the opportunity to have someone help them with energy-related issues that compromised their ability to maintain a good quality of life, some clients were willing and able to take action and others were more resistant to change. In particular participants with multiple distractions in their lives, like energy debt, tended to have limited capacity to engage. They were focused on crisis management, and had little or no time nor bandwidth²¹ for exploring possible new ways to achieve secondary capabilities in their home.

How did social innovation help end users to respond better to the inhibiting conditions they faced?

Evaluation of Home Visit Plus found that the use of Motivational Interviewing had limited success at stimulating clients' capacities for heating their homes and achieve other activities in the home to enhance their quality of life. The Home Visit Plus trial did not show that clients were more likely to make relevant behaviour changes than clients who received standard home visits.

Advisors found it challenging to adopt the language patterns of MI, which requires skill and practice to integrate smoothly into 1:1 conversations. Certain aspects of the MI-influenced process were thought useful though. These included the phone call ahead of the visit (made by the advisor making the visit) to prepare for it, an activities sheet to help participants identify where they are high users

²¹ Bandwidth refers here to the brainpower that could be used for planning, problem solving etc discussed as being limited due to the stress induced by poverty in Eldar Shafir's 2013 book *Scarcity: Why Having Too Little Means So Much* (Times Books)

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and so where they could make savings, a written action plan to clearly summarize actions from the visit and a chart based on Ofgem figures to show if participants were a high, medium or low energy user. The evaluation did not prove that these additions to home visits led to behaviour change but did show that there were positive benefits on client satisfaction and bill savings.

In contrast, the evaluation revealed that installing small measures at home visits was effective and was appreciated by both clients and advisors. The changed dynamic of advisors being able to install measures or to request them facilitated, as was expected, improved conditions in people's homes. Participants reported having a warmer home after having draught proofing installed, or experienced a more consistent temperature following replacement heating controls, and better sleep resulted from fitting new curtain liners. These are all significant benefits that can maintain health. However, there was little difference in the likelihood of clients who received enhanced visits or standard home visits to purchasing and installing measures recommended by advisors, possibly due to the high percentage of participants that were on a low income.

Advisors considered that both measures and behaviour change advice got overshadowed by external pressures and large problems like fuel debt. The visit needed to sort out the crisis before covering measures or behaviour change. For example, Mr and Mrs B were struggling to heat their home and had a damp issue, but changed how they used their heating and hot water controls based on the advice given during an enhanced home visit. The advisors referred them to local installers after checking for grants to upgrade their storage heaters. During the evaluation interview, Mrs B said she could not recall if this had progressed because their lives had been very hectic between the interview and the visit. Their heaters have not been upgraded. She did not remember discussing the damp issue.

This latter point of 'information overload' was remarked on by other participants – those who received an enhanced or standard home visit - who reported that there was no change in their ability to heat their home or achieve other secondary and basic capabilities because they found the information too much to take in or difficult to grasp. This response may have been conditional on health issues, reduced bandwidth due to external stresses, low literacy or not having English as a first language. The need for more support to take on advice is therefore a key aspect to address to reduce fuel poverty.

Other reasons that clients cited for not making changes included not being able to afford to heat their homes to advised temperatures, preferring to do things the way they always have or trying a new behaviour and not liking the results.

An example of where advice improved a client's situation but its effect was limited by an external factor is with Mr V, a social housing tenant. Mr V received an enhanced home visit and took on the advice given on use of night storage heaters and his immersion tank. He changed his behaviour to only boiling the water he needed and showered rather than bathing. The advisors also installed draught proofing strips which Mr V felt made a real difference, and left him with some LED light bulbs to install. The advisor also took measurements for installing secondary glazing and in the follow up after the visit spoke to his housing association on his behalf to get the works arranged. Unfortunately, Mr V's housing association would not allow him to go ahead with installing secondary glazing due to issues around planning permission. He was satisfied with the visit but felt that the

Social dynamics and energy vulnerability

response from his housing association was frustrating, as the single glazed windows were the main cause of heat loss in the property, so he decided to try to move out. Mr V's capabilities for having a warm home and hot water were enhanced, to the extent that he felt more empowered to engage with his landlord and to consider changing location when this capability was curtailed by his landlord.

Insights for the model

Findings from the Home Visit Plus trial support the use of a capability framework to understand energy vulnerability as it clearly identified large external pressures like fuel debt as crippling to participants capability to meet basic heating needs for health. It identified the inhibiting condition of a 'chaotic lifestyle' (i.e. highly stressed and dealing with crises on a regular basis) as hampering a client's ability to upgrade their heating system, and noted that vulnerable households need extra support to assimilate energy advice and to act on it. However, some households with financial constraints still have limited ability to heat their home to a healthy temperature. The changed social dynamic with an advisor's ability to facilitate the installation of small measures was effective, valued, and could enhance a participant's ability to request further improvements to external agencies, and to push for further, far reaching changes if this was not forthcoming.

The model highlights some areas for potential interventions:

- Deal with the urgent causes of client inhibiting factors first e.g. debt, unstable housing situation
- Offer ongoing support (more than one visit, phone updates, referrals for further assistance) to clients to avoid information overload
- Create connections with trusted trades people to install small measures. These can make a significant difference to client's comfort and fuel bills for a small investment.

Case study: Smart and Snug

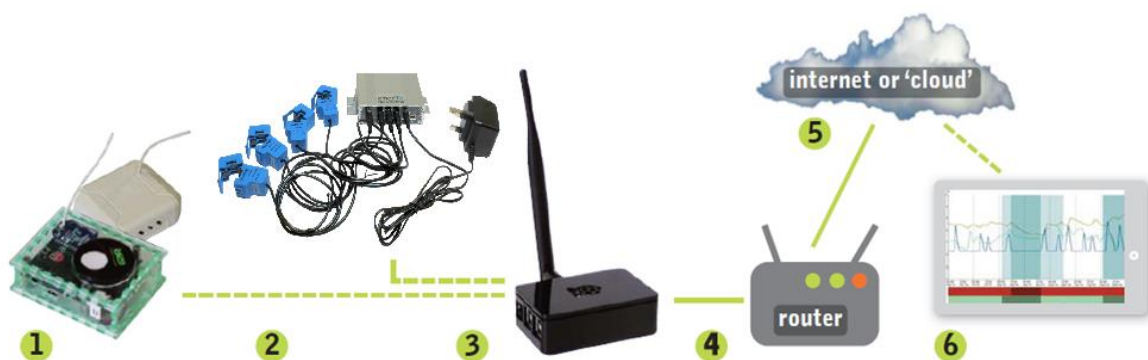
A recognised challenge for energy advice services is that advice needs to be personalised and tailored to the client's lived experience so that they are more likely to change what they do in response to it. This can mean clients adjusting their daily routine, habits and beliefs about how things work. The social relationship between advisor and client is an important ingredient. CSE has trialled how different approaches to advice delivery can help enhance client capabilities.

Project approach

The Smart and Snug project sought to test whether a changed approach to advice delivery could help improve people's ability to heat their home affordably. The approach used included a mix of technical innovation and a change in the way advice was delivered to the clients. The technology installed in clients home during the advice delivery period generated data on household energy usage, indoor temperature and humidity which was then used by the energy advisor to offer more personalised energy advice. Advisors were also able to show and explain the information to clients to help them better understand the advice and so make it more likely they would act.

Those involved were older households, many with long term health or disability conditions, in rural off-gas homes with night storage heaters. Many worry about the cost of heating and find the night storage heater controls confusing. Many such households find it hard to heat their home effectively and affordably, with harmful consequences for their health and wellbeing. Fourteen households participated in the trial. The technology installed in the client's home as part of the Smart and Snug trial is shown in Figure 4: it enabled the advisor to observe the interconnection between energy use, temperature, humidity and energy cost in real time and show it to the client during the advice visit.

Figure 4: The Smart and Snug application



1. Temperature and humidity sensors
2. Clip on electricity monitoring device
3. Raspberry pi computer with radio link to receive sensor data
4. Ethernet connection to the home's broadband router
5. Data sent to CSE servers via the internet
6. Web-based interface to view the data

Social dynamics and energy vulnerability

The clients received advice at a home visit once data had been collected for at least 2 weeks. The advisor used the visual displays generated by the installed kit on the web interface to show clients how daily variations in levels of warmth and humidity related to their current heating settings and behaviours. The advisor talked through how suggested adjustments to heating settings and behaviours could help them better heat their home to fit their own needs.

After 2-4 weeks the advisor revisited the client at home again and talked through any differences observed in the visual displays on the web portal. They checked with the client how this might relate to changes in their heating settings and other behaviour changes made since the advice visit. Clients were able to directly observe the impact of their actions on warmth and humidity in the home and find out the financial impacts of those changes. Advisors were able to determine the uptake of energy advice and how the changes within the home had been experienced by the client.

End users

Residents

Many residents didn't check for the best available tariff and switch supplier, and some didn't understand how to make best use of their Economy 7 tariff. Clients also didn't understand how night storage heaters are designed to work, charging at off peak time and then releasing heat over time, controlled by adjusting the output dial. Most clients exhibited low energy literacy about the more economical costs of heating their home using night storage heaters on Economy 7 compared to the more costly use of plug-in electric heaters in the daytime, when the unit rate of electricity is higher. Similarly they had limited knowledge of how to use immersion heater timers and controls to heat water at off peak times, and of the financial savings they could enjoy compared to the equivalent cost of heating water during the day.

Residents had limited awareness of the warmth and humidity that resulted from using different heaters, heating settings and household activities. Some had concerns about humidity in their homes, but were unsure what constituted 'a damp problem' and what contributed to it.

Residents also experienced challenges due to tenure, for example one private tenant living in a very energy inefficient home was confident in dealing with their landlord but didn't know about grants for energy efficiency improvements. Many residents were limited by health issues, financial constraints and restricted internet access to get the support they needed.

Residents' abilities for using heating controls for space and water heating was varied before the intervention. They showed greater capacity in relation to the timing of activities/use of appliances (e.g. doing the laundry or charging devices) which would be cheaper to do during off peak hours.

Not being equipped with the right knowledge and information compromised resident's ability to achieve a healthy living space, which could in turn affect primary capabilities such as health and social relationships. Furthermore, by spending more than they needed on their heating, residents faced financial constraints that could affect their ability to afford other services, including for food shopping, meeting up with friends or family or accessing services.

Energy advisor

Energy advisors previously had access to limited information before a home visit on which to base personalised advice. This information might have included referral notes, billing information, and details of household circumstances and energy-using activities from preliminary communications with the client. During the visit the advisor could observe heating control settings, note the temperature (and possibly humidity) of the home using a thermometer card or simple temperature/humidity sensor, and determine energy usage from In-Home Displays (in homes with a smart meter), bills, meter readings or direct liaison with the energy supplier. Engaging with the client in their home enabled the advisor to build on the relationship initiated in preliminary conversations, to observe their home situation, to demonstrate/make changes within the home e.g. to heating controls, to get information from energy suppliers that required client consent, and to ascertain any unvoiced client needs.

The usual nature of energy advice visits is weakly participatory, with the roles of engagement being expert and client. This is due in varying part to advisor habit, the vulnerability of the client, the client's situation, the focus of the visit, and time constraints.

Before trialling Smart and Snug, advisors had a curtailed capacity for 'giving accurate personalised energy advice' due to lack of information on the actual cost of heating and energy-using practices in the client's home. They didn't have real time energy and environmental data from the client's home that could be investigated and shared. Advisors also had limited capacity for 'evaluating the impact of energy advice' in terms of whether action was taken by the resident following a home visit and the interrelationship of fuel use (and its cost) and environmental factors (temperature and humidity). Advisors had no capacity for spotting anomalies in energy use e.g. timing of heating.

Advisors had limited competence in understanding space heating with Dimplex Quantum heaters²². Some households recruited had these high spec storage heaters. Smart and Snug offered advisors an opportunity to verify the cost of use, control and heating results of these heaters in a few homes.

How did social innovation help end users to respond better to the inhibiting conditions they faced?

Change in user response

Advisors indicated they were able to build a strong connection with the participants due to the extended engagement time and more in depth work. Framing the engagement as research that was intended to be mutually beneficial also changed the dynamic of the social interaction. The sense of trust and joint exploration helped to inform residents and reinforce advice messages and actions.

²² Quantum heaters are compact, highly insulated storage heaters with an easy to understand LCD display. They can be pre-set with a seven day programme and have different modes e.g. 'holiday mode'. They integrate a boost facility so that heat is available at all times. Cost assumptions based on space heating using 90% off-peak energy found in independent tests that quantum heaters could cut the electric bill by up to 27% compared to a standard storage heater system and up to 47% compared to an electric convector or radiator system. From <https://www.dimplex.co.uk/product/quantum-heater>

Social dynamics and energy vulnerability

Having real time visual feedback in the sensor data of the impact of changes made within the home enhanced engagement beyond what would be achieved with clients in three home visits.

“It was very useful. It did change the way I think about energy - it made me think about shutting doors, showers and windows. Also heaters and how better to control them” House Br

Residents’ abilities for accessing affordable domestic energy supply improved, in switching to a better tariff and in understanding how the Economy 7 tariff operates.

“I found it quite easy to understand the way it was set out but needed [Advisor M] to help me through it. His explanation helped me greatly. It helped me change supplier”. House Brd

The capability of some residents to access domestic energy services like water heating and laundry at a cheaper price through temporal changes to household activities also increased. Some clients did their washing during Economy 7 off peak times, or heated water less frequently each week whilst still meeting their needs for bathing and cleaning.

Residents’ capacity around space heating, and the use of heaters and heating controls were greatly enhanced, through the combination of social connection and visual feedback on behaviour changes. Some residents learnt for the first time how to use their night storage heaters without fear of high fuel bills:

“We looked at our ancient night storage heaters that we didn’t know how to work, and learnt to how to set them, now they work and they’re warm. Now we’re snug as a bug down here and the energy bills aren’t more”. House F

Through discussion based on the data the advisor and client were able to identify household activities and make behavioural choices based on the energy cost, temperature and humidity impacts observed. Without this discussion the debunking of residents’ long-held energy myths and the change in their sense of energy in everyday life is less likely to have occurred.

“The amount of humidity in the bedroom was very surprising, especially the change between the beginning and end of the trial it reduced loads. They reduced it by putting the night storage heaters on correctly” House F

Change in social engagement

Smart and Snug enabled residents to engage with other people in new ways. One private tenant felt empowered to make strategic requests for energy efficiency improvements to their landlord, and then went on to access a local community grant which was used to pay for double glazing in a non-listed ‘property of local significance’. By combining their existing wider social connections and increased knowledge the tenant was able to access financial resources. This affected the dynamic of the relationship between tenant and landlord, as the landlord benefitted significantly from the interaction in improving the EPC rating of the property.

Social dynamics and energy vulnerability

Social engagement with neighbours was also stimulated through Smart and Snug, for example a resident spoke with a neighbour to try and mitigate a damp problem.

Change in advisor capacities

The conversation facilitated by Smart and Snug increased advisors' capacities for giving personalised energy advice based on the data. Advisors could also confidently disaggregate electricity use for smaller appliances and more accurately interpret the data. Without the interaction with the client this was sometimes difficult to do. For instance, a resident identified when they had used a wall – mounted panel heater which had not increased the temperature in the room and was wasting money. They subsequently utilised a portable oil-filled radiator which heated effectively at no extra cost. A change in the social dynamic to a more collaborative way of working between advisor and client improved the advisor's ability to identify a heating source and to suggest a better one.

Advisors' ability to give energy advice was also enhanced around appliance running costs. For example, an advisor compared the running costs of two under the counter fridges – one new, one retained from the 1970s – in two participants' homes. It is unknown whether having information derived from another research participant, or the significant savings in running costs of getting a new fridge exerted the most influence in the participant's decision to get a new one.

Smart and Snug improved advisor capacity for evaluating the impact of energy advice, as the cost, temperature and humidity changes could clearly be determined from the data. Changes in a participant's capability for heating their home to a healthy temperature was directly observable. In some instances overheating was identified, and the advisor suggested slightly reducing the heating settings. The advisor could note the reduction in fuel cost but accompanied by maintenance of a healthy indoor temperature.

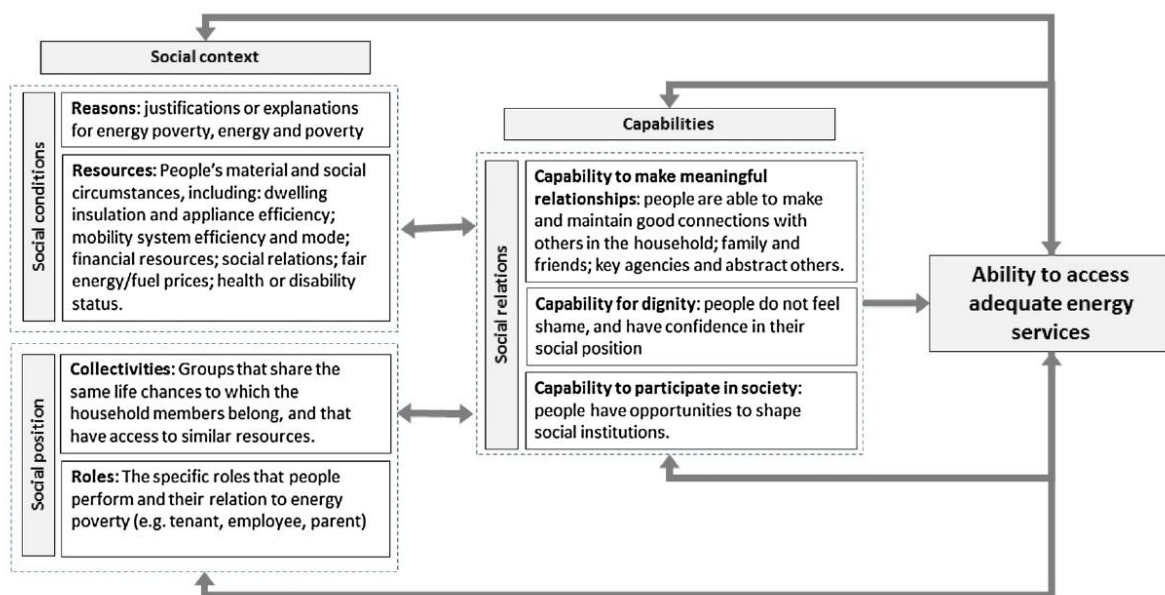
Insights for the model

The capabilities framework is useful in this instance to highlight the very useful change in social dynamic between client and advisor in Smart and Snug and strong element of trust which was effective in part at improving the client's capabilities to heat their home, have hot water and to achieve other secondary capabilities like laundry in a cost-effective way. This in turn could positively affect a client's capability to maintain health and possibly other primary capabilities. The engagement in wider social networks to access financial resources for home improvements or elicit help to mitigate potential problems is also noted.

It was the combination of enhanced social interaction and visual feedback on behavioural changes which was successful.

However even with the additional crucial aspect in Smart and Snug of visual feedback and accurate information on financial impacts, advisors were unable to encourage some participants that under heated to change behaviour. In this instance considering a slightly different interpretation of social capabilities (Middlemiss et al.) may be useful as shown in Figure 3. Middlemiss et al. interpret capabilities as social relations (capability to participate, for dignity, and to make meaningful relationships) which influences and is influenced by social context.

Figure 3 Conceptualising the systemic relationship between ability to access energy services, social relations capabilities and the social conditions and positions which shape these.



A client's reason for lack of energy use to maintain a healthy home might be informed and compromised by reasons for heating use or non-use which relate to collectivities e.g. 'make do and mend generation'. When thinking in terms of behaviour change, this could be equated with self-concept. For example, thinking about Smart and Snug using the Behaviour Change Wheel²³ residents' motivation to change heating actions was not sufficiently increased by having information on likely financial impacts. Even when their physical and psychological capabilities – using capability in a different sense here - as physical ability to make a change and the psychological know how on how to do so – change did still not come about. Whilst their reflective (cognitive) motivation may have been engaged, their automatic (affective) motivation may not have been. These other aspects around social position, conditions and motivation would be useful to explore further.

²³ Michie, S., M van Stralen, M., West, R. (2011) The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*, 6: 42

Case study: WHAM – Warmer Homes Advice and Money

Problem Situation

Fuel Poverty support

People in fuel poverty who access energy advice typically experiences a number of inhibiting conditions such as poor health, debt problems and housing that is in a poor state of repair. Whilst most energy advice services can support clients with some issues beyond their energy use, including income maximisation support, most refer clients in need to specific debt support or home repairs to other agencies. When advisors refer clients to other agencies, they often have no further involvement with the client.

Clients can fail to engage with other services. Explaining their own complex situation to a new unfamiliar person can be extremely daunting for many clients, including clients experiencing mental health problems. Particularly vulnerable clients who are experiencing poor health, and juggling multiple expenses on extremely low incomes can also miss appointments and lose track of advice.

Health care settings

The health care sector aims to ‘make every contact count’ by identifying areas where patients require more support, including those at risk of cold homes. The link between cold homes and poor health is well established. But how cold homes support is delivered in practice is variable. In many cases whilst patients are asked about their ability to keep warm at home, health workers are extremely busy and procedures for helping patients living in a cold home is unclear. Often this information is simply recorded and no further action taken. With multiple competing priorities, fuel poverty is frequently not prioritized.

Project Approach

WHAM is a partnership between seven organisations in Bristol and North Somerset providing a single point of contact for fuel poverty support. The organisations specialise in energy, benefits and welfare advice, debt and money management and home repairs. The project aims are to:

- improve the warmth, comfort, safety and security of the home
- improve knowledge and confidence around energy bills and managing energy more efficiently
- reduce debt and help people manage their money
- ensure households are receiving all of the benefits they are entitled to
- providing advice on legal, immigration and housing issues

Clients are assigned a single caseworker who can support clients with a wide range of issues over an indefinite amount of time. Where clients require more specialist support, or services from different

Social dynamics and energy vulnerability

organisation, the caseworker acts as a coordinator by arranging the support and remains in touch with the client. Clients can remain in touch with one case worker who understands their situation.

A WHAM case worker also works across three NHS trusts, supporting discharge teams to ensure patients are being discharged to warm and safe homes. The caseworker supports patients in hospital and after discharge, and encourages referrals from health workers. They provide advice and coordinate services including installing heating systems, fixing or upgrading heating measures, home repairs, adaptations and insulation.

How did social innovation help end users to respond better to the inhibiting conditions they faced?

The project provides a holistic range of services to help tackle the multi-faceted problems experienced by clients. Case workers assist clients by working through interrelated problems, supporting them directly and co-ordinating support from other services if needed. Having an ongoing relationship with one case worker can help people feel comfortable accessing support from a range of providers. It removes the need for clients to explain their stressful situation again to someone new and the confusion that may result from engaging with manifold agencies.

“It’s having a name and a number of somebody who understands their situation, because I think a lot of the time people feel like they have to start from the beginning again which is so frustrating for people when they’ve got loads of stuff going on.” WHAM caseworker

Navigating different services can be extremely challenging for some vulnerable people. One WHAM case worker described a client who has multiple health conditions, with adult children living at home who also have serious health conditions.

“She just really struggles with anything to do with paperwork or just dealing with general life admin. She can’t really remember to do stuff, gets really confused about who’s doing what for her, who she needs to contact about what.” WHAM caseworker

The case worker supported this client by organising home repairs, applying for unclaimed benefits, sorting out debt problems and accessing support from occupational health. By providing reminders and help organising appointments the case worker can continue to build a relationship with the client – and the client’s capability of enjoying trusted relationships – as they access support.

“So I think that’s a great example of where if it’s something that we’re involved with I make a note of who it is that’s dealing with what. Then even if it’s not necessarily something that I’m directly organising for her, I can at least remind her of that.” WHAM caseworker

There is no time limit on how long case workers can support clients, which also helps to build trust. Lack of time restriction enables caseworkers to help clients deal immediately with a crisis situation, then provide longer term support to help them manage other issues. The ability to do this was really appreciated by caseworkers.

Social dynamics and energy vulnerability

“Not always but often the people we’re helping are in some sort of crisis or some kind of flux in their situation and getting them a bit of extra income or just a bit of help to sort things out so that it’s more stable and manageable” WHAM caseworker

Caseworkers also encourage clients to reach out to people they trust for support, to ensure clients feel in control and build their confidence.

“I sent her a letter out, because she goes out every Tuesday with her sister who is the only person she really sees all week, I just sent her a copy of deals that were available, talk to your sister, come back let me know what you want me to do. They shouldn’t feel pressured by anybody and then they can just make a decision about what’s best for them, that’s why I tell them to go and talk to other people.” WHAM hospital case worker

Many older people have a family network but social situations are changing and children don’t always live nearby, so the elderly can be isolated. Similarly, older people might lack access to technology, which is increasingly a route via which connections to services are requested or the full range of options e.g. energy tariffs made available. WHAM can bridge these social and digital divides. However, the project aims to support people to build the capacity to manage their energy bills, and access support when they need it. Helping people build the skills to cope on their own without relying on their caseworker can be challenging for caseworkers.

“It’s always really difficult striking that balance, I always struggle with that because you don’t want people to become reliant on you; you want to give them the skills and the tools to be able to do stuff themselves.....A lot of the time people who come to us for help it’s because they feel like there’s nobody else that’s helping them with anything, so they kind of feel like they’ve tried to get help from services or from friends and family and are just coming up against a brick wall. It might be through their own sort of – they don’t have the capability to do things, they don’t know how to do it.” WHAM caseworker

“So I kind of help them at first and then I like to try and tell people how to do it themselves, but then also the approach of following up in a few weeks or a few months to check, “Have you actually done that thing that we talked about?”” WHAM caseworker

Caseworkers recognise that in an ideal world their advocacy services wouldn’t be needed, but that a combination of lack of capacity by energy supplier staff to understand the needs of people in crisis, and the reticence of clients to share their difficult situation create a vacuum that requires a trusted third party intermediary – at least initially. Clients are encouraged to let their energy supplier know they are struggling and not ignore problems, to reduce anxiety about energy bills in the future.

“Our role as advocate for them with their supplier shouldn’t be necessary, the supplier should have people on the phone line who understand peoples’ situations and can deal with them appropriately. That often doesn’t happen and having somebody to speak on their behalf is really useful....But I think our aim should always be to get them to explain their situation to their supplier more clearly. I think that’s often the problem is if they’re not telling the supplier, “I’m really struggling.” Then they don’t know, so they just say, “this is how much you need to pay and that’s it, you haven’t got any choice.” WHAM caseworker

Social dynamics and energy vulnerability

A caseworker explained that equipping people with the knowledge that support is available, and understanding how to access it if they need it can be very reassuring for some people.

“Having us as an advocate is really valuable for a lot of people, so I think having the confidence to know that there is help out there and feeling more stable is often something that people say.”
WHAM caseworker

This is particularly true for older people who may be targeted by scammers and are possibly more vulnerable if they are socially isolated.

“I am taking that pressure off them, that they have to deal with that and the older generation, that’s something that they are worried about, having to deal with the conflict if something goes wrong and I think having a single point of contact is always so important to people.” WHAM caseworker

One caseworker works specifically in healthcare settings across three NHS trusts, to have a presence amongst staff and patients in hospitals in Bristol and North Somerset. By having a presence in each of the hospitals, working alongside frontline health workers, the WHAM caseworker is now known by the staff. Increasingly, health workers are more aware of the health risks linked with living in a cold home and refer patients to WHAM for support. Having face to face contact with staff and patients ‘on the ward’ makes a real difference in quickly identifying patients in need and their support requirements, although the caseworker can meet patients in their homes as well as in hospital.

“It’s on the wards that it’s more valuable and walking round and seeing the nursing staff and meeting the discharge teams and the Well at Home team, so integrating with the teams that are already doing what I do, but within the NHS.” WHAM caseworker

Insights for the model

Interviews with WHAM caseworkers highlight how WHAM aims to help clients by tackling a wide range of inhibiting conditions through ongoing support, a trusted relationship, and building the client’s capacity to develop a support network and confidence in their own abilities.

The case study reveals the complexity and interconnectedness of the inhibiting conditions that can push people into fuel poverty, and the importance of a flexible and holistic approach to supporting people build their agency to move out of fuel poverty. The lack of flexibility often observed in energy supplier and benefits system services coupled with clients’ wariness to share details of their situation can create an impasse. This gulf can be crossed if clients can take the helping hand of an independent WHAM caseworker because they do not fear ‘saying the wrong thing’ which might restrict their access to essential resources like an income, food or energy.

Social dynamics and energy vulnerability

However a subtle balance needs to be found by caseworkers on developing trust but not dependency. A trusted relationship needs to be built with clients, especially if some need help with *“all the things that maybe aren’t even visible to the rest of the family”* (as one caseworker put it). The influences that affect a client’s ability to cope are very broad, and sometimes cannot be revealed to those closest to them. There is a tension in a caseworker’s aim to support people to build their capacity to cope on their own, and not to build dependency on the caseworker. Then again, a client may not be capable of or want to risk changing a relationship they have with close friends and relatives on some topics – it may be perceived as too dangerous. Even in the longer term clients may need significant support to broach a sensitive topic with someone close to them, or to access specialist support from a new source. The idea of simply building someone’s capability to have healthy relationships as an enabling factor to reduce fuel poverty is a complex one.

A caseworker commented:

“Fuel poverty is only one part of what’s underlying in someone and that the social side of it. Being vulnerable, being in poor health, maybe not having access to transport..., maybe they live alone, maybe they don’t see somebody until the pharmacy turns up every Tuesday with their dosette box. I understand what the picture shows, I understand how it’s done and I agree with it, but it’s not the reality, it’s not that simple and maybe that needs to come across more that yeah the concept is there, but it’s so much more than that”.

The caseworker thought that ‘fuel poverty’ wasn’t, in some instances, about poverty at all:

Interviewer: *“In itself it’s just poverty isn’t it really?”*

Caseworker: *“It’s not even poverty, it’s maybe just lack of capability.”*

Interviewer: *“And that will be impacted by many, many things?”*

Case study: Energy in Schools

Social activism on climate breakdown inspired by and led by young people across the globe made the headlines in 2019. Many pupils want climate change to have more prominence in the national curriculum, but few understand how their energy-using actions at home and at school affect climate change. Schools are social environments dedicated to modelling and teaching pupils about the basic competencies of how to learn, how to maintain health, how to build and maintain relationships, and to respect self, other, school and the wider environment. Energy in Schools has trialled the use of fun, curriculum-aligned learning resources and real time energy and environmental data to explore the abilities of school building users to engage in energy issues.

Project approach

Schools are high energy users, with energy bills taking a significant portion of the school budget, ranging from £17,000 - £100,000 per year. Their budgets are under huge financial pressures to provide adequate staff and educational resources to achieve the schools' basic role of being a learning environment. The tide of social expectation is also turning to schools to 'lead by example' and reduce their energy use and their carbon impact. This expectation is predominantly internal (from pupils, parents and school leadership), for example by schools rejecting rebuild plans because the design does not meet their sustainability aspirations.²⁴ An opportunity for schools to be involved in wider social engagement is also presented in the development of local authority climate change strategies e.g. Climate Emergency Network for B&NES Schools.²⁵

The maintenance of the school environment for learning and health is dependent on key capabilities for space and water heating, ventilating, accessing information, communicating, and preparing and cooking food. Staff and pupil capacity to manage the school environment in terms of heat, coolness, fresh air and light may be compromised by the building fabric, building use, heat, light and air conditioning technologies, and appliances available. Building users' differing subjective experiences of temperature in particular, coupled with a lack of understanding or ability to adjust heating and ventilation technologies can lead to energy waste and/or a poor learning environment.

Energy in Schools²⁶ explored whole school involvement in energy use and management of the school environment and its impact. It utilised energy monitoring integrated with smart devices and micro:bit²⁷ coding to engage business and site managers, teachers and pupils via a shared Energy in Schools web portal (Figure 1). The website displayed real time energy use and could show sensor data (temperature, motion and door movement) on a floor map of the school. Lesson plans and

²⁴ Renewables barely feature in building programme for 500 schools. Liz Lightfoot. The Guardian 18.02.2020

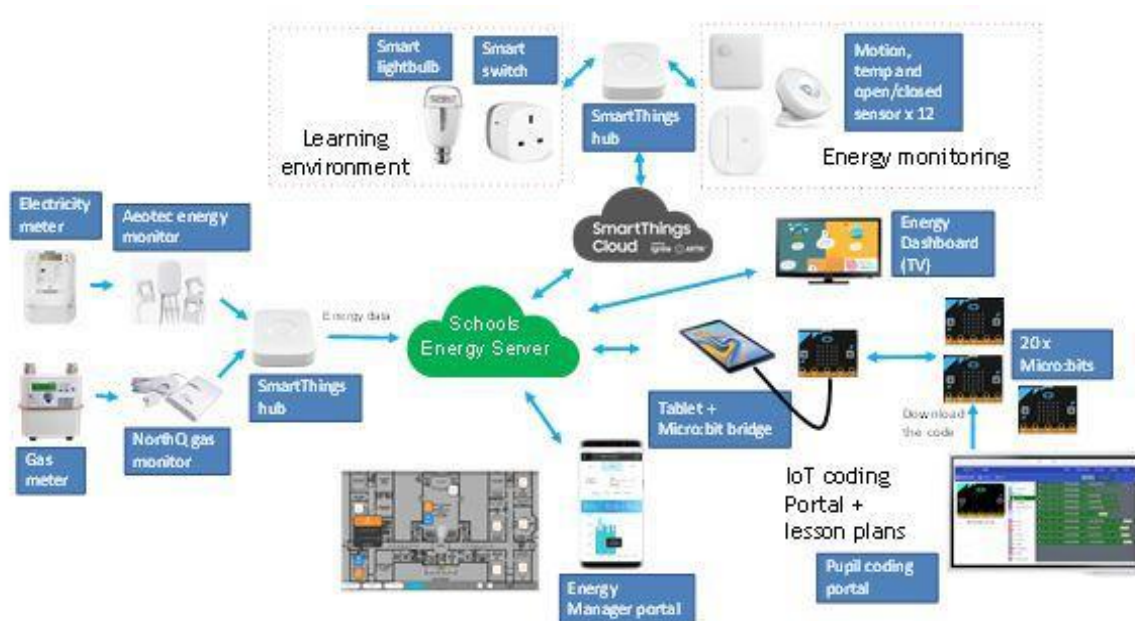
²⁵ Transition Bath February 2020 e newsletter highlighted that an alliance of over 50 schools, representing more than 50% of both state and private schools in Bath & North East Somerset had their first meeting in December 2019 to discuss how schools can address the Climate Emergency

²⁶ Energy in Schools, a BEIS-funded project from 2018-2020, was a partnership between Samsung, Lancaster University, Centre for Sustainability and My Utility Genius

²⁷ A micro:bit is a tiny programmable computer designed to make learning and teaching easy, fun and affordable. www.microbit.org

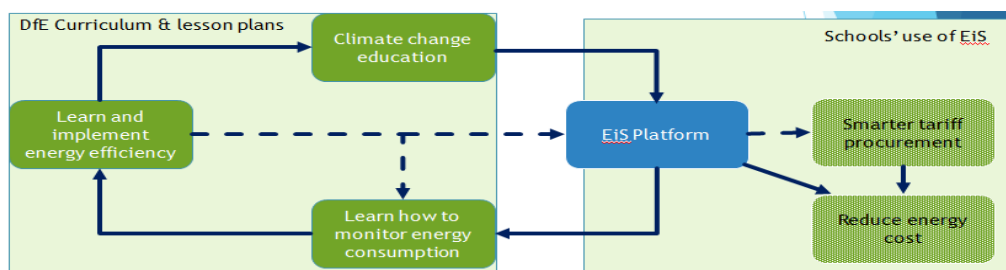
learning resources enabled teachers and pupils to find out about energy, climate change and the Internet of Things (IoT) and learn coding skills through practical use of micro:bits and smart sensors, light bulbs and plugs. A programme of activities for pupil energy champions designed to complement lesson plans and stimulate awareness and wider school action on energy use was provided. A TV screen in a prominent position within the school displayed feedback on progress on energy use to the whole school.

Figure 5 Architecture of Energy in Schools system and technologies



The Energy in Schools (see Figure 2) project also probed the ability of schools to reduce their electricity use at peak time, 4-7pm. Schools generally have low peak time usage compared to other organisations on non-domestic tariffs like hotels, restaurants, and businesses. Because it costs more money (and usually creates more carbon emissions) to generate electricity at peak time, schools are in effect subsidising the fuel bills of non-domestic energy users with high peak time usage.

Figure 6: Energy in Schools (EIS) overview



Energy in Schools explored the ability of schools to decrease their peak time electricity use, and the potential impact on fuel bills of switching to a Time of Use tariff, with a high peak time rate, lower day rate and cheap night rate. The Energy in Schools website integrated a tariff comparison and switching site, but as no suitable Time of Use tariff was available at the time of the trial and few

Social dynamics and energy vulnerability

schools had smart meters to enable use of a Time of Use tariff, this switching facility was not active. Potential impacts on fuel bills of such a tariff were instead based on a model Time of Use tariff.

In the main phase, Energy in Schools worked with 20 schools across England. Prior to this, three schools, recruited through prior or personal contact, were engaged in a pilot testing phase to test the EiS platform, technology installation process and learning resources (October 2018-January 2019). The EiS platform, tech set up processes and learning resources were then revised following preliminary evaluation. Twenty more schools were recruited through national promotion via the micro:bit foundation and at computing education events. Schools with higher pupil premium as an indicator of family income or other vulnerability were prioritised for selection. The revised EiS platform, processes and learning resources were trialled July – December 2019.

Schools were supported in setting up the energy monitoring, smart devices and TV screen via phone support or a site visit, and were introduced to the learning resources and Energy in Schools web portal via an induction day. Ongoing phone and email support were available. Interschool competitions and online sessions supported pupil energy champion engagement. The TV screen showed where each school was placed compared to others in terms of its electricity, gas and peak time electricity reduction per pupil to give feedback on behaviour change and stimulate engagement (Figure 3).

Figure 7 Taunton school electricity league image on TV screen



Evaluation of the Energy in Schools project in December 2019-February 2020 included:

- quantitative data analysis on aspects of energy consumption for all 23 schools
- an online survey sent to teachers, business and facilities managers in 20 schools (7 teachers and 10 business/facilities managers responded from 17 schools)
- qualitative interviews in 10 schools with different user groups
- Web analytics and project learning notes were also used. The evaluation was conducted internally by project partners, in conjunction with external evaluators Ipsos MORI.

End users

All school building users

The ability of building users to connect the impact of their actions to the cost of energy use and to temperature was obscured by lack of access to real time energy or temperature data before the energy monitoring, smart devices and EIS platform was installed.

Aside from the school leadership, other building users including the site manager had little knowledge about school fuel bills. This lack of feedback on energy use put it out of sight and mind, resulting in building users having little motivation to cut energy waste. No schools had environmental policies.

Staff capacities for creating an amenable learning environment in terms of temperature, ventilation and light was challenged primarily by the built environment, and lack of ability to control these factors. This may have been due to the building management system (building users couldn't change the heating controls), or lack of ability to adjust heating controls. Where it was possible to take some action e.g. opening windows, using fans, using portable heaters, this often resulted in energy waste.

Business manager and site manager

The ability of school business managers to access affordable energy services was compromised by the high commission fees (around £5000) charged by unregulated energy brokers, difficulty engaging with the only school tariff switching site in the UK²⁸, and frequent lack of information on energy use and tariffs if the school was part of a local authority power purchase agreement.

Business managers' capacity to monitor school energy use was also hampered by billing of variable quality, and lack of information on metering and which energy-using activities they enabled. For example, a primary school had 9 electricity meters but had no information on what buildings or activities they related to. Energy monitoring was particularly hampered by the lack of smart meters and smart meter data, especially for larger schools with three phase meters. Smart metering could easily provide half hourly energy data, but three phase meters are not yet being manufactured for the UK market, and are not compulsory in the non-domestic sector.

Business managers had limited capacity to reduce school fuel costs and demonstrate low carbon energy generation in relation to decision making on installing energy efficiency improvements and renewable technologies. Display Energy Certificate reports recommend suitable improvements based on low, medium and high impact and payback time, but without examples of potential costs and savings. Schools had not completed bespoke energy audits. If business managers were new to the post, understanding the intricacies of existing renewable technologies and Feed-in Tariff payments was a challenge. Business managers had little or no connection with people who could advise them on fixing faults in existing technologies. Recommendation of a contractor through local school networks did make it easier for business managers to install solar PV.

²⁸School Switch, operated by the Crown Commercial Service

Social dynamics and energy vulnerability

Site managers had variable capacity for understanding boiler heating controls, for example in checking the timing of heating programmes particularly during school holidays. They also had mixed competencies in using IT. Interrogating energy and sensor data to manage the school environment (when available) was restricted by lack of time.

Teaching and IT staff

Primary school teaching staff had variable competencies and little time to set up smart devices. If a teacher or dedicated IT manager was not setting up the smart devices, often IT consultants were employed by the school for a few hours each week to address tech issues, and any additional work had resource implications.

Teachers previously had had very limited capacity to facilitate pupils' learning about climate change and energy use in a practical problem-solving way, in a real world setting. Teachers also had variable capacity for engaging learners in computing and coding activities, with means to integrate this into cross-curricular themes of work.

Pupils

Pupils had limited ability to make changes in the school environment to modulate temperature, air flow and light. They had no ability to monitor the school's energy use. They were often highly motivated to reduce energy waste. Many had taken on roles involving taking responsibility for turning off lights or computers when not in use, or had made other sustainability actions. Pupils had little understanding of how energy use affects climate change at home and at school.

How did social innovation help end users to respond better to the inhibiting conditions they faced?

All school building users

Energy in Schools helped school building users to become more energy literate and confident about what they could do to reduce energy waste. 94% of staff (online survey N=17) agreed that they had tried to reduce the amount of energy used since the start of the project. They discussed energy-related topics with pupils more often, and thought that pupils had increased in confidence on energy topics to a similar extent as themselves (83%). Three quarters of teachers and business/facilities managers said the pupils had influenced the energy changes made in school. There was also a change in dynamic between pupil and teacher, with pupils being empathetic to staff needs as well as reminding them to reduce energy use.

"Because it helps them out ... sometimes the teachers have a lot on their mind about work the next day so they forget to turn off computers" P2 energy champion

However a change in roles and relationships which resulted from Energy in Schools activities caused tension. It highlighted the need for senior management leadership and joined up action on energy reduction across the school. Pupil energy champions turned down classroom radiators to '3' if set higher, but this caused problems because some staff felt cold and the facilities manager thought the boiler controls had malfunctioned. The lead teacher identified the need to talk with his colleagues in

Social dynamics and energy vulnerability

more depth about the project. This didn't fit in with assemblies and hadn't been covered in staff meetings. The business manager had limited expectations about energy bills because the school's fuel bills had remained static due to a partial new build. This diminished their prioritisation of taking action on energy:

"I know he (lead teacher) wants to save energy but I'm the one who manages the bills.

Our energy bills aren't that high... I've been monitoring them now for the last seven years and they've not gone up that much over the years and they should be because obviously the energy, the cost of energy is going up but we're still maintaining that." P4 business manager

The business manager lacked the capacity to assess what a new, appropriate energy consumption amount was for the school based on improvements in building energy efficiency.

Business manager and site manager

Business and facilities managers' behaviour on checking tariffs and monitoring energy use didn't appear to have changed significantly following engagement with the Energy in Schools platform.

Access to the Energy in Schools platform motivated 5 facilities managers to take meter readings more often. The project did prompt school staff to look for additional information or advice on energy management or energy efficiency measures.

The 3 schools that engaged in Energy in Schools in 2018-2019 had energy audits completed for them by the project. One primary school Head successfully applied for a Salix loan for LED lighting installation based on their energy audit report. They also used the Energy in Schools platform to spot heating anomalies, and were empowered to use the energy data to challenge their boiler contractor to debunk a heating myth and get their heating system fixed:

"We wouldn't have picked that up if we'd not had that (Energy in Schools platform), or certainly we'd have been fed the line, it was this thing, and we wouldn't have known any different, whereas with all the information we have on that, on that kind of platform, we were able to..... I'd printed it off and highlighted - it went on here, it went on here, it went on here - so that's been fantastic." P2P1 Head

Energy in Schools increased this Head's capacity for engaging in energy monitoring, access energy efficiency grants and discuss energy issues with contractors. They reduced the school's electricity bill by 5.5% saving £525, and gas use by 5.3% saving £168 for December 2018-November 2019.

The platform enabled facilities managers in particular to energy manage premises in a more informed, productive way. Facilities managers were prompted by having access to real time energy and temperature statistics on the platform to be proactive and optimise building systems:

"I think for me in my role it's almost a kick up the backside to say, come on, you can do a little bit more, or actually look into it a little bit more and see what we're doing". S1 Director of Facilities

Social dynamics and energy vulnerability

Teaching and IT staff

Some teachers struggled to fit in the lesson plans, energy champion online sessions and competitions within predetermined curricula and timetables. Energy in Schools impacted in a negative way on one teacher:

“All these other schools were doing competitions and inventing this and inventing that, and I just thought I’m not there, and that was a little bit overwhelming. I mean I know it’s great to enter competition, but I just struggled with the time.” P4 teacher

This teacher partly struggled as she’d ‘inherited’ the project from a former colleague with more experience with IT and coding.

Pupils

Teachers reported that pupil energy champions were more engaged at school and at home as a result of participating in Energy in Schools. Pupils enjoyed having a role and responsibility. Two teachers commented:

“L’s mum has actually told me about how much he loves the energy and the science lessons, and when he goes home and he educates his family on it.” P2 teacher

“Their teacher said “they (energy champions) seem to have turned themselves around, they’re doing really well” and they did assessments last week, she said, you know “they really shocked me, they did really well compared to last time” and so I do wonder if them having a bit of responsibility has helped because they were picked for a reason to sort of give them something as a bit of a push.” P4 teacher

Changing social dynamics

In secondary school S4 energy champions were trusted by the computing teacher with the ‘admin’ log in to set up the sensors and hubs.

“They use the admin one because they’re sort of helping me with the project a lot as well, and I think that’s the way the project has gone hasn’t it, it’s sort of like it’s a joint thing, it’s not sort of me running it, it’s us joining it together.” S4 teacher

“It’s a very open community” S4 energy champion 1

“It’s a co-operative like teamwork” S4 energy champion 2

Insights for the model

The inhibiting conditions for schools overall, which make it harder for them to avoid spending so much of their income on energy are building issues, unfair energy tariffs and charges, and lack of prioritisation and joined up action on reducing energy consumption and greenhouse gas emissions. This is compounded by staff cuts (e.g. facilities managers and teaching staff) leading to time poverty and stress which limits teachers and business/facilities managers’ freedom to take on anything extra

Social dynamics and energy vulnerability

in a busy school environment. Some schools then have insufficient income for basic educational resources.

The capabilities framework is useful in describing energy vulnerability as a dynamic condition in which people/organisations do not have the opportunity to obtain the energy services necessary to support quality of life - or for a school, quality of education services. The external pressures experienced by school staff, such as hidden, high energy broker commission charges and lack of non-domestic tariff switching sites remove that opportunity and compromise their ability to make wise energy procurement decisions. Whilst school staff recognise that there are means to reduce school fuel bills, they do so primarily through a behavioural lens. They fail to recognise tariff switching even as an opportunity to reduce fuel bills, partly but not wholly due to the unfairness of the energy system in which they operate.

The Better Energy Futures report identified that people try to maintain a sense of reliance and stability in the midst of instability (Groves et al., 2019). This could explain why business/facilities managers may not attend to energy reduction in the midst of building transformations. It is one less thing to deal with; in fact it could reassuringly be taken as a sign of success if bills have remained stable. This mitigates further action.

Within the complexity of school life, lack of energy opportunities are not recognised by school staff. It requires deeper digging by a 'trusted messenger' to do that. Energy in Schools used the COM-B behaviour change wheel²⁹ to identify interventions and policies to ameliorate systemic factors which reduce building users' ability to deal with energy challenges. For example it highlighted specific policy areas that would greatly enhance schools' abilities to manage and reduce their energy consumption such as:

- The roll out of 3 Phase smart meters, and requirement for energy suppliers to provide accurate bills with energy consumption information and easily digestible schools energy reports.
- Guidelines for school energy/environmental reporting
- Regulation of energy brokers and suppliers to stop unfair commission charges

A lack of these opportunities hampers all school building users' capacity to manage the school environment and to take practical, meaningful climate action.

²⁹ Michie, S., van Stralen, M.M., and West, R. (2011) The behaviour change wheel. A new method for characterising and designing behaviour change interventions.

Case study: Powering Up

Problem Situation

People living in deprived communities can experience the energy system as something over which they have limited or no control. Even the choice to switch energy supplier can feel difficult for people with low levels of digital engagement and almost impossible for people in arrears on energy bills or who have had a pre-payment meter fitted by their landlord or supplier. Lower income households may not have sufficient savings to afford the upfront costs of repairs and energy efficiency improvements to their homes whilst tenants are reliant on their landlord to invest in fabric improvements. The planning system and energy policy arena offer limited opportunities for community engagement on energy decisions or for local capture of benefits. Community energy activity is predominantly the preserve of middle-class communities with the time, money and headspace to engage in projects that require upfront investment of capital, time and effort.

Project Approach

Powering Up is a three and a half year initiative in which community development approaches were trialled to stimulate action by local residents and intermediaries on energy in three deprived communities – one in South Wales and two in South West England. The communities were chosen on the basis of having high relative rates of multiple deprivation and no prior engagement with community energy activity and within reasonable travel proximity to Bristol. The project led to the development of a set of tools for use by other groups seeking to nurture community-led social action on energy in deprived areas.

The project was designed to work through phases of initiation, iterative cycles of co-creation and testing ideas and then sharing learning. Initiation-phase activities comprised ethnographic interviews and workshops, stakeholder mapping, attending and running local events, and identifying local people interested in engaging further. During co-creation, project workers ran a variety of workshops and meetings with the aim of helping individuals to develop ideas for activity and intervention, to then be tested out. Testing ideas involved project workers supporting local people to further develop and test out co-created ideas. In practice, initiation-type activities continued into the co-creation and testing phases, as it proved harder than expected to generate and sustain engagement by sufficient numbers of individuals. In turn, it proved hard to move forward from co-creation phase activities into individuals feeling confident and committed to test ideas. Project workers divided their time across three communities, typically visiting each community once or twice a month during the initiation, co-creation and testing ideas phases.

End users

Residents

The ethnographic work sought to understand local residents' lived experience of energy and their relationship with their local community. It found that despite energy use being perceived as a significant household cost, it tends to be seen as an unavoidable cost but also taken for granted:

Social dynamics and energy vulnerability

"I personally don't think much about it. It's just there and it's just easy to use and you just get on with it and you just pay the bill"

"We've had a hard winter this year, it's been cold, so we've had to use...the bills will go up"

People felt highly cynical about the behaviour of energy suppliers and about the existence of meaningful choices about energy generation and usage:

"They know they've got you over a barrel, you need electric, same as gas really, nowadays. They put the prices up and you've got no say because there's no other choices out there because I can't put a windmill thing in my garden to produce enough for me to have electric. And solar panels, like I said, they're too expensive. So the only thing you have is your mains, so you don't have a say of how much it costs, you just pay the bill every time it comes in."

Workshop participants had low levels of energy literacy about how the wider energy system works to generate and supply energy for heating and other domestic uses. There was widespread and favourable awareness of solar and wind power but those who had considered getting rooftop PV panels installed had experienced financial barriers. Climate change did not feature in discussions in summer 2017 and there was very low awareness of community energy projects. People felt their only option for control was switching tariff, recognised as a fairly insignificant form of influence and with scepticism about the significance of any savings:

"To be honest my usage is so low, the savings wouldn't be all that good, I don't think."

In initial conversations with local people project workers heard a definite sense of disempowerment in relation to energy. Through their ongoing engagement with individuals, both at meetings and in conversations, project workers recognised other 'inhibiting factors' that affected people's ability and willingness to engage in energy-related initiatives. These included long term health conditions, carer responsibilities, unemployment and economic inactivity, food poverty, poor quality housing, social isolation and withdrawal of council support services.

"People were saying, "I live in sheltered accommodation, so I pay a set fee because I'm in sheltered accommodation for my energy." Or, "I don't do my own meter readings and stuff, it's all done for the whole block of flats at the same time." Lots of people living in social housing or private rental, not much home ownership, and people struggling with other issues, so lots of people with health issues, learning difficulties, unemployment. Clearly coming to the café because it was a chance to pick up some free food and have a nice neighbourly time and be somewhere warm." Project worker

One specific example of disempowerment in relation to energy was when a tenant moved into a property with a prepayment meter, and accepted living with that when they wouldn't have chosen it as an option. Also people were angry about expensive fuel bills, but at the start of the project were disengaged from the energy market e.g. they didn't bother to check tariffs or switch supplier to reduce energy bills. Project workers reported a general feeling of malaise in relation to energy bills, that it was an inevitability of life and wasn't a priority compared to more pressing concerns like a sick mother or a child not in school.

Social dynamics and energy vulnerability

Participants in the ethnography held varied attitudes about their communities but a recurrent theme was a decline in community-level activity, with recall of past activities that had ceased to happen. In one of the communities, participants recalled how historic generous funding had helped make the estate better and created lots of activities for children which then disappeared when the money stopped, leaving the sense that things had since gone downhill.

However, across all the communities there was evidence of some level of ongoing community-led activity, including drop-in cafés, ad hoc coffee mornings, a street reps scheme, litter picks, sports activities, plus parent and child-focused activities. In the initiation and co-creation phases, project workers learned about and engaged with regular community activities, including a regular council-run community café which provided a base for activity in one community. Project workers observed both the start-up of new initiatives and the ending of existing community-led initiatives. In each of the communities, the most common explanation for community-led initiatives ending was the departure of one or more lead volunteers.

Potential community energy champions

The majority of the effort of the project workers was focused around trying to nurture ongoing engagement by individuals to be involved in and start to come up with ideas that they could deliver themselves to address energy-related issues affecting their community. They sought to apply principles of an Asset Based Community Development approach to build engagement but with a focus around addressing energy-related issues rather than an entirely open-ended approach to address issues identified as priorities by the community.

In the co-creation phase, structured events run as social activities with a practical focus (e.g. a workshop to make draught excluder snakes) brought people together in a friendly way where outreach workers were able to initiate conversation around energy literacy and low cost ways to avoid energy waste.

Running friendly hands-on activities, such as a shared slow cook meal and a hands-on draught excluder session, hosted at existing drop-in cafes attended by local residents, enabled people to learn about energy issues and practical ways they can save money on their energy bills and which also bring benefits of a cheap warm meal or a less draughty home. Initiatives which seek to engage people around energy issues need to also address other constrained capabilities, so that they help people realise a range of valued co-benefits (or capabilities) connected to energy, such as the ability to prepare a healthy cooked meal, keep your home warm and comfortable and connect with others in your community.

However, it proved hard to transition that enthusiasm for taking part in an organised activity into committing to helping run such activities themselves:

‘We used the café as our hub and done advice stalls as a way of demonstrating what a project could look like. We got lots of people interesting to coming to ask for advice, but not particularly being, like “This is something I can picture myself doing”’

Most of the individuals engaged did not sustain their engagement beyond one or two activities. Some maintained ongoing online contact with the project workers and responded to invitations to

attend further activities, but all too often, they would cancel at short notice due to other commitments or due to ill health. Everyone who engaged as a volunteer was already involved in the community, the majority in environmental activities or they had an interest in the environment. No one was a new community activist.

In one of the communities, project workers did meet and sustain ongoing engagement with Kate³⁰, a local mum and graduate in environmental studies who was not in paid work due to carer responsibilities. She was already helping to run a drop-in café and a youth rep scheme, and was enthusiastic about getting involved. Kate became the most active local resident by participating in events and keeping in touch with outreach workers between meetings via social media. She jointly ran a stall at an eco-festival with a CSE project worker and took part in social media training and energy awareness training. This helped build her confidence. She really valued the support and resources available as part of the project and increasingly took initiative, developing her own ideas for activities. But her own carer and other volunteer responsibilities meant that she found it difficult to follow through on all her ideas herself or to recruit others in the community to support her. Nevertheless, Kate has now become known as ‘the energy person’ who people approach with questions. Other local people have been enthusiastic but whether for reasons of health problems or caring and volunteering responsibilities have found it hard to step forward to lead activities.

The project tried various modes of engagement. For example training in using social media for volunteers to give them the skills to run a campaign on their energy project was broadened out to the wider community and proved popular (in contrast to Energy Awareness training) as it had so many other applications. Building generic skills was found to be important.

How did social innovation help end users to respond better to the inhibiting conditions they faced?

The project ran over 3 years which is much longer than for typical community energy engagement projects. However, the team involved found that the project suffered from being spread too thinly working across multiple communities and staff not being able to be a regular presence in a community. One project worker highlighted the importance of sufficient time and embeddedness to build familiarity and trust:

“You can’t do community work in a community you aren’t in. It takes time to get to know the people who are involved and get yourself embedded ... having a regular presence. Maybe we tried to move a bit quickly or hadn’t demonstrated enough.”

The Powering Up project demonstrates both the strengths and the challenges of an Asset Based Community Development approach to addressing energy deprivation. The friendly, supportive engagement by CSE project workers, as well as specific skills training and use of co-delivery helped to build Kate’s confidence and skills to organise and support others. During the project, her own enthusiasm, environmental knowledge and existing activism in the community were key assets

³⁰ Not her real name.

Social dynamics and energy vulnerability

nurtured in efforts to generate social activity to address forms of energy deprivation and disempowerment. Kate's activities included posting energy-related information to a community Facebook group, having a weekly mailing list for sharing news, running an energy stall at a Big Lunch event, provided energy-related advice at a weekly drop-in café and helping individuals to sign up to the Warm Home Discount on her phone. These activities helped local people to address problems of energy affordability and to gain more understanding of energy issues. However, her own responsibilities limited the extent to which she was able to recruit others as trained energy champions and to deliver more frequent drop-in energy cafes.

However Kate's local council noticed that there were lots of environmental activities happening in the area and ran a consultation to find out what environmental improvements people thought were important. Enough people voted for energy that the council put some funding into piloting the installation of outdoor solar lighting on social housing. This would reduce the tenants' service charges. The people who voted for energy were those who attended the cafes and local activities where Powering Up had had a presence, indicating that people had started to think that maybe solar powered lighting would save them money. The project workers did consider that the project had influenced the community's attitude to energy, and it was an example of people exercising some power over local energy usage – but not in their own homes, and not how project workers had envisioned.

In other communities, it proved hard to create a group of individuals willing to commit to engaging on a regular basis around energy issues. In one community, the most significant benefit was running educational energy activities with pupils in the local primary school, whilst in another community a local association sought the support of project workers to integrate energy efficiency and renewable energy generation considerations into the design of a new community building. However, there has been limited interest in engaging around the energy issues experienced at household level as a community.

Despite project workers' efforts it wasn't possible to engage in more depth with learning disabled people via adult learning in one community, due to the restricted remit of those services.

Insights for the model

This case study illustrates how inhibiting factors experienced at individual, household and community level affect people's ability to afford energy to achieve primary capabilities in their daily living. It also highlights how inhibiting factors can constrain people's capabilities to organise as a community, to achieve greater control over energy choices at a community level.

The available social assets in relatively more deprived communities, in the form of locally active individuals motivated to make a difference, may already be strained by other caring and volunteering responsibilities, particularly in the context of the withdrawal of council services. Longevity and embeddedness are likely requirements of asset-based approaches to enable social innovation led approaches to make a community-level impact on problems of fuel poverty and to support people to make meaningful energy choices. The tendency of projects to 'come and go' in deprived communities can drain the enthusiasm of local people to get involved beyond seeking short term benefits.

Social dynamics and energy vulnerability

There is promise in that even just one motivated individual who is active and well-known in their own community can help to build knowledge and support individual action on fuel poverty. However, as with other community-led initiatives, without a larger group or network of individuals, there remains the risk that the departure of one motivated individual will lead to community-level activity coming to an end. But with ongoing engagement, the wider community's priority of energy as an issue can increase. This can lead them to make energy choices that benefit households and communities, albeit through indirect action like voting rather than community-led initiatives.

Appendix A Case study guidance and template

What do we want to find out from each case study?

Please describe and comment on:

1. What is the nature of the energy vulnerability being experienced? What are the basic and secondary capabilities not being met? What are the 'broken' points in the relationship between energy, services and outcomes.
 - a. For off-gas customers, is the cost of oil or electricity for heating prohibitive?
 - b. For domestic customers, is the energy tariff high relative to income?
 - c. Are there issues with the energy efficiency of the home, operation of the heating system (by the person or the condition of the system), household appliances, or knowledge/behavioural challenges experienced by the household?
 - d. Secondary capabilities affected: What choices are compromised e.g. people choosing or not able to heat home / wash clothes / engage in community activity
 - e. Basic capabilities affected: basic health / social respect / relationships / learning
2. What are the external pressures 'inhibiting conditions' which push the end user further into energy vulnerability?
3. What are the existing 'end user responses' that mean that on their own they are stuck / being pushed further into vulnerability / unable to respond adequately to external factors?
4. How far does the project's approach rely on 'technology' fixes and how far does it make use of 'social innovation' – changing how people engage with others – to help overcome energy vulnerability? How do these go together?
5. What is it about the social innovation approach that helps with changing:
 - a. The inhibiting factors e.g. creating new ways of engaging with supplier / landlord
 - b. The user response
6. What observations about the strengths/ limitations of the model at present for understanding social innovation in relation to energy vulnerability – and for helping to design solutions
7. What reflections on the strengths / limitations in use of capability (focused on individual, not household) as concept for understanding energy vulnerability?

Case study template

Case study title

Project approach

This needs to briefly set out what is the service model for the project, its objectives, 'philosophy', scope, scale, location, how it is delivered and timescale. And the generic problem situation being addressed in terms of:

- The energy problem experienced and how this affects the end user (individual, household, community, school and its pupils). The 'problem situation'

Social dynamics and energy vulnerability

- The external pressures which make it harder for people to achieve decent quality of life, relating to e.g. cost of energy

End user (individual / household / school & pupils)

- What is their situation, existing capabilities, (pre-intervention) end user response and interaction with inhibiting conditions (that push them under / diminish their quality of life)
- What are end-users views on their situation - how does this shape how they act - before intervention? What choices are compromised?

How did social innovation help end users to respond better to the inhibiting conditions they faced?

- How does the 'social innovation' work to effect any change to inhibiting factors / to user response? Change social dynamics? Introduce new forms of social engagement? Which relationships are changed? (e.g. with supplier, with landlord, with other service providers?)
- What actions by end user does this result in? Does it work to build capabilities or does it work to avoid worsened harm where end-user response might result in worsened situation?
- What difference will this change mean for end-users' future ability to achieve health? Relationships? Education? Security in homes? Other aspects of quality of life?

Insights for the model

What reflections from this case on the strengths / limitations in use of capability (focused on individual, not household) as concept for understanding energy vulnerability? What does it overlook? What needs more explanation?

Reflections from this case on strengths/ limitations of the model at present for understanding social innovation in relation to energy vulnerability – and for helping to design solutions? How is it helpful? What is missing? Does model help recognise value of social innovation? (How) does it help in designing possible solutions?



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