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Moving beyond feedback: Energy behaviour and local engagement in the United Kingdom

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ABSTRACT

The energy savings potential within non-domestic buildings from behaviour change initiatives is well known. Energy efficiency measures can contribute to local, national and EU policy commitments on carbon reduction. Yet, research also shows behaviour change is anything but simple. No-where is this more evident that in local government where municipalities are expected to lead on carbon reduction initiatives whilst operating in challenging political landscapes. This paper reflects on a UK Research Council funded case study exploring the role of engagement in a UK municipality. Innovative feedback tools and user-engagement were developed in an effort to foster a collaborative approach to energy management.

Findings from an analysis of a focus group and a set of semi-structured interviews show encouraging signs with regard to increased user-engagement and digital tools, but barriers remain with regards to the 'real world' implementation of innovative, and technologically grounded, approaches. These included a staff reduction programme amidst financial cuts, a risk-averse culture with regard to new technologies, and debate about where responsibilities lie with regards to energy management. While these findings were case specific they have implications for organisations contemplating how technology might support them in workplace engagement for reduced energy use.

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1. Introduction – saving energy in the workplace

Saving energy in the workplace is both a significant challenge and an important opportunity given that the world's non-domestic and commercial buildings account for over 30% of global energy use and 20% of greenhouse gas emissions [1]. In its brief history, this journal has acknowledged the importance and complexity of understanding energy behaviours within the workplace [2–4]. This study contributes to this conversation by presenting the experience of attempting an engagement exercise within an Energy Services team in a UK based local authority. In particular, this project draws on what Sovacool [5] identifies as a key research opportunity; utilising the knowledge of the non-experts as well as those formally responsible for energy management. The 18-month research project identified difficulties in the engagement of building users, particularly when that involved technological innovation. Nevertheless, reflexivity in case study research is an established approach and, caveats notwithstanding, the authors believe there are lessons learnt within this case that are relevant to the wider UK, EU and international community.

Non-domestic buildings have both a significant impact and vital opportunity for meeting challenging global carbon reduction targets given the levels of waste involved. The literature tells us, for example, that building users can waste up to 30% of energy in their buildings [6] through simply not turning lights and computers off when not in use. In a recent field trial of individual energy use in offices, Murtagh et al. [7] showed that energy use in office computing contributed approximately 30% of energy demand in the European service sector over the last decade. Complimentary research by Mulville et al. [8] has found much IT office equipment is under-utilised and left on overnight.

The scope of the Gooddeeds study is energy management within local authorities, and in particular, Leicester City Council, who like many municipalities, both in UK and the EU, are implementing ambitious carbon management strategies in response to a challenging and ever changing policy context, notably the Energy and Performance Buildings Directive (Directive 2010/31/EU) and the UK's Climate Change Act (2008). Research into the role of building energy performance certificates has found for example that these can be a useful catalyst for behaviour change when combined with engaging building users [9]. Leicester City Council has

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set an ambitious target of 50% reduction based on 1990 levels by the year 2025. They have a long history of delivering energy reductions through ambitious energy management and participation in European networks such as Energy Cities and the Covenant of Mayors.

2. Social media and feedback

One area of research receiving increasing attention is in the field of energy visualisation tools and 'dashboards' that provide feedback to the building user; these tools have been cautiously heralded as an opportunity for behaviour change [10,11]. The majority of work on energy use has been carried out with individual households in the residential context. In this work academics have explored the best ways to re-connect people to energy through the use of systems that show the price, unit-cost or CO_2-cost through a live feed or half-hourly metering, and what effects this had on the building-users [10]. The premise, as with displaying building energy certificates, is that through the visual display of a building's actual energy consumption, building users will be motivated to act [9]. Findings have shown that whilst feedback does offer potential for reducing consumption, between 5 and 15% on average [12], there is no simple cause and effect between installing new forms of domestic energy metering and subsequent behaviour change by the householders. Recent follow-up research has shown that it is all too easy for these devices to fade into 'the background' [11].

Moving beyond 'mere feedback', there are examples of exploratory studies that examine the potential of information technology and tools such as social media for behaviour change within energy and buildings [13–16]. Crowley et al. [16], for example, linked up their building management system to Twitter to send building users targeted messages querying consumption. In their study this resulted in a 26% reduction in energy use. This is not quite living up to the 'social' dimension of social media though which sets out to draw on the wider knowledge of the community. Differences remain though between research that points to the potential of social media to have an impact (for example [13]) and those that have actually attempted an intervention in the real world [16]. This aspect is explored by Foster et al. [14] in which they explored workforces' perceptions of social media through a series of workshops. They note employees' concerns around privacy and trust, two themes to which will be returned.

Concluding their research into providing individual energy feedback to University employees, Murtagh et al. [7] offer a sobering reflection for behaviour change. Simply put, whilst the potential for significant savings are high, motivation is low. So, whilst many of these interventions to change behaviours are noble, well meaning and, sometimes, effective, they are based on a particular 'information-deficit' or rational approach to behaviour change – if 'they' have the right information 'they' will change behaviour. The need for increased user-feedback and engagement is noted but the prevailing tone of this literature and research errs towards the paternalistic with someone, the 'expert' or those in power, influencing other people (residents/employees/non-experts) to stop behaving one way and start behaving another. As earlier research into using the digital economy in buildings for energy behaviour change discovered, this is further complicated by the complex interplay of organisational culture and concerns over ethics and trust and their impact on behaviour [17].

Recent publications, both in this journal and further afield have highlighted this increasing complexity of energy behaviour change in the non-domestic setting. For example, a special issue of Architectural Engineering and Design Management was devoted to 'The Impact of the Building Occupant on Energy Consumption' and included several papers exploring behaviour through the lens of organisational behaviour and management practices. Research conducted into energy behaviours in a retail organisation found that (1) employees organisational roles and work objectives would often trump the energy efficiency imperative, (2) employees had minimal control over energy consumption [18]. Recently two papers within this journal applied the theory of planned behaviour (TPB) to understanding energy behaviours in the workplace. Chen and Knight [2] note the importance of norms within the workplace and the affect of social context on behaviour. This was also seen to be the case in Dixon et al.'s research into energy behaviour in an American University where a sense of community had a 'small but significant direct effect on behavioural intention' [4, p. 125]. Scherbaum et al. [19] present a wider overview of the literature around energy behaviours in the workplace and note the spectrum of approaches from both the organisational level down to the individual level. Whilst these studies are instructive, they do not necessary fulfil some of the democratic ideals that Sovacool [5] notes in which ordinary building users and non-experts are a source of knowledge rather than people who need to be corrected and act 'the right way'.

In response to this, Janda and Moezzi [4] echo Owens and Driffill's [20] argument by calling for a move away from mere feedback mechanisms to understanding and recognising the community and social potential of workplace cultures through organisations adopting a more participatory approach to energy management. This paper then presents a real-world case study of what happened when a team of researchers, working with the Energy Services team at Leicester City Council, attempted a more participatory approach to energy management and explore the wider potential of digital technologies beyond just feedback, for energy management. First, the relevant literature is briefly explored before presenting the research approach and then findings are discussed before, finally, offering some reflections and lessons learned.

3. The public engagement literature

Arnstein's [28] 'ladder of participation' (see Fig. 1) explored a set of steps to increased participation, and ultimately, empowerment. At the bottom was information provision, a predominantly one-way form of communication, and then moving to consultation, a

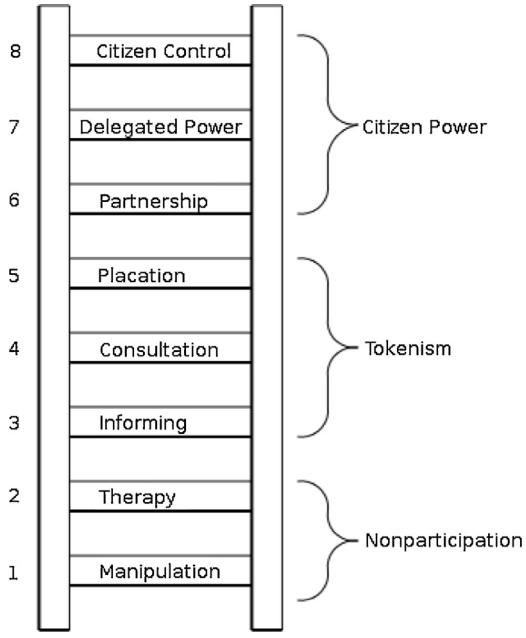

Fig. 1. Eight rungs on the ladder of citizen participation [28].

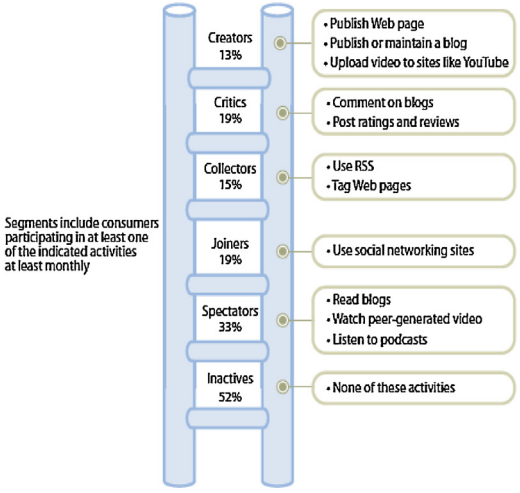

Fig. 2. The new e-ladder of participation (cited in [21]).

relatively passive process asking for people's opinions but not necessarily engaging them in debate. Participation is normally used to refer to processes which allow people to participate in a decision by putting forward their views verbally whereas engagement goes further, suggesting an innovative and interactive, two-way process of discussion and dialogue (i.e. deliberation) to ensure that people's views inform a decision, alongside those of the expert and/or decision-maker. This is still one-step removed, however, from Arnstein's top step of her ladder that defines empowerment as people taking control of decisions and their implementation. In a parallel (e)ladder (Fig. 2), Forrester Research (cited in [21]) have mapped levels of (e)participation within society in the United States. In this new 'e-ladder' of participation, Ferro and Molinari [21] note the key features of Web 2.0 and social media, notably the idea that people can move from being inactive (at the bottom of the ladder) to be creators (at the top). This maps across to Arnstein's ladder and the theme of increasing control.

The principles of public engagement methods have been tried and tested in the siting of controversial facilities such as waste facilities [22] and transport planning [23]. Sovacool [5] notes three benefits of engaging 'non-experts', first, democracy is increased as all citizens have a right to participate and be represented in environmental decision making, second, non-experts are often more attune to the ethical issues of a situation, and third, greater acceptance can often be achieved by involving those affected by the situation.

The theoretical underpinnings find their roots in Habermas' theory of communicative competence which was successfully mined in the early 1990s by Thomas Webler [24]. Webler [24] explored how language functions to form key foundational principles for the management of deliberative practices within the school of risk communication. Working from the premise that participation is "interaction among individuals through the medium of language" [24, p. 40], Habermas [25] argues that any communication between two individuals would fail without cooperation. An individual's ability to use language to create understanding and consensus is referred to as 'communicative competence'. Habermas [25] outlined a set of ideal conditions in which communicative competence would be best served, known as his 'ideal speech situation'. Webler [24] applied these principles of communication to the formulation of a set of criteria and rules that would transform democratic ideals of deliberative democracy into practice. Increasingly, links are made between public engagement and learning, increased environmental citizenship and behaviour change [22].

In short, people can be a valuable source of knowledge and wisdom and, if given the opportunity, capable of handling complex information and resolving complex problems. Yet, these principles are still under-researched with regards to energy behaviours in an organisational context and questions remain as to how applicable they are. These questions are to be explored, but first, the case study is introduced.

4. Introducing the case

4.1. The context

In 2013 a team of academics (the authors) started working with the Energy Services team at Leicester City Council (LCC) in the East Midlands, England, to explore a collaborative approach to energy management. De Montfort University (DMU) has had close relationships with the Council for many years, working closely around energy monitoring, DMU and LCC share the same metering systems for example, and have produced joint papers on the benefits of automatic metre readings [31]. As a result of this there was good access to the Energy Services team responsible for energy reduction within the City Council. A proposal was submitted to UK Engineering and Physical Research Council and their Digital Economy programme resulting in the 'research in the wild' project discussed below.

4.1.1. The participants

The joint aims of the project were to explore a more participatory approach to energy management through the testing of digital tools such as smartphones and social media. A user-group was formed from representatives of a range of the council's non-domestic building stock. The purpose of the group was firstly to facilitate interactions and knowledge sharing about effective energy management between lay building users and experts. Second, the user-group would work with the research team to provide user-feedback on the development of an IT based application to foster interaction between building users across the city council and to test the potential for smartphones to help manage energy. The tool would go beyond the provision of energy 'feedback' to building users and would allow them (expert and non-expert) to provide real time comment on any problems and issues they identify in their buildings; they would be able to feedback into the system rather than simply receive feedback from it.

The user group was formed with help from the team leader of the Energy Services team who acted as 'gatekeeper' to the city council. An email was sent to 16 employees from various locations with a range of roles and responsibilities. After a couple of attempts to recruit a suitable group a core of eight was formed. It was not possible to get everyone who was approached, due to organisational complexities and politics, for example, just as the project started Property Services, home to the Energy Services team, began a process of cost-cutting and redundancy. A core group of eight was formed (Table 1) which included two members of the energy services team alongside staff members with no specific responsibilities for energy.

Table 1
Members of the Gooddeeds user-group.

Role	Type of building
Senior Library Assistant	Library
Senior Community Librarian	Library
Duty Officer (in charge of buildings)	Leisure centre
Admin and Business Support Team Leader	Social Services Administrative Building
Housing Options Officer	Housing Administrative Building
Energy Services – energy officer	Property Services Building
Energy Services – team leader	Property Services Building
Assistant Facilities Manager	Property Services Building

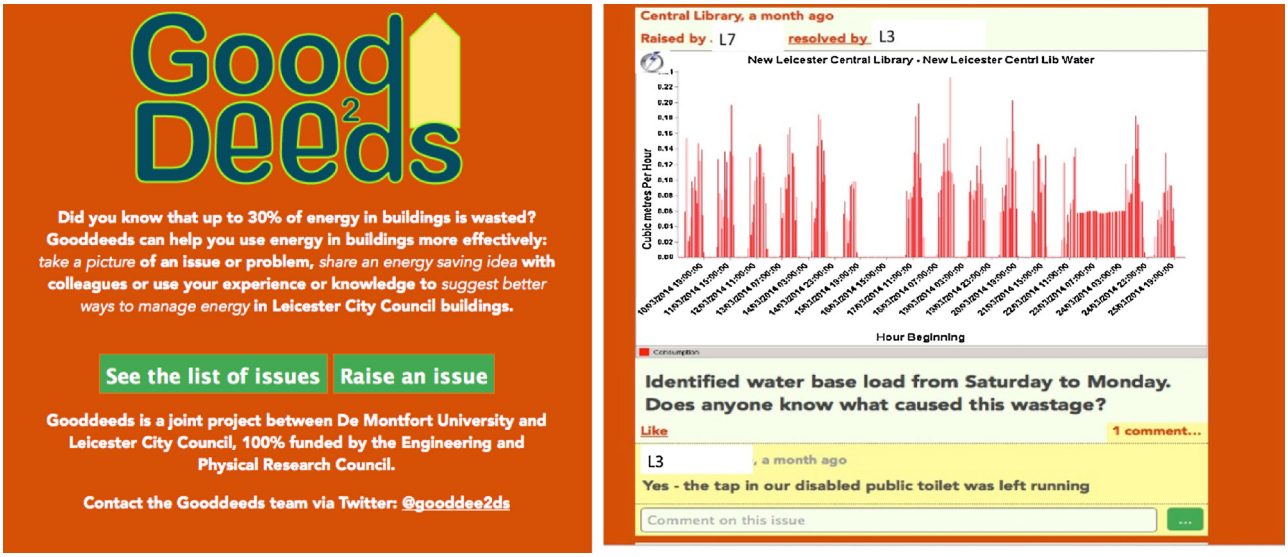

Fig. 3. Screenshots of the Gooddeeds application.

Table 2
A list of respondents (members of the focus group and the interviewees).

Code	Role	Building	Focus group (Y/N)	Interviewed (Y/N) – code
L1	Energy Services – team leader	Property Services Building	Y	Y
L2	Housing Options Officer	Housing Administrative Building	N	Y
L3	Senior Community Librarian	Leicester Central Library	Y	Y
L4	Senior Library Assistant	Leicester Central Library	Y	Y
L5	Admin and Business Support Team Leader	Social Services Administrative Building	Y	Y
L6	Duty Officer (in charge of buildings)	Leisure Centre	Y	N
L7	Energy Services Officer	Property Services Building	Y	Y
L8	Head of Energy Services	N/A	N	Y
L9	Social Media lead	N/A	N	Y
L10	'Channel Shift Lead'	N/A	N	Y

The user group met fortnightly for two months between May and July 2013. A series of 'expert' presentations were provided by the research team on the relationship between people and buildings, energy and buildings and social media and iPhones were provided to all members of the group who, during the initial meetings, were guided through the range of functions – texting, social media and the camera. On the fourth meeting participants reported on what form the application should take and this set the initial ground rules for the design of the app. The group decided that Twitter and Facebook had useful functionality (Twitter – the ability to share information, Facebook the ability to comment on posts) but that, due to concerns about the public nature of Twitter, would before a prefer a bespoke responsive web application. From September onwards the meetings switched from fortnightly to monthly between September 2013 and January 2014 as the development team began work on the design and functionality of the responsive web based application. At each monthly meeting the technical team and user-group would meet to review the progress and to decide on the key features of the app. These included being able to view the application on either webpages or smartphones, allow building users to raise an issue with a building and then comment on what needs to happen to resolve the issue (see Fig. 3 for screenshots of the app). The energy team could post details of consumption and 'feedback' extracted from their building energy management system but the dashboard would allow building users to interact with it via posting comments. Crucially, this bespoke application allowed for the app to be only visible by employees of the Council through a secure login system.

The project evaluation was undertaken in two stages: a mid-point evaluation of the user-group process was undertaken before the app was launched in February 2014 via an independently chaired focus group. This was preferred to interviewing the participants individually because focus groups allow for greater exploration of why people feel the way they do about a particular issue [30]. This was conducted with the aim of reviewing the overall user-group process before users actually started to use the app.[1] At the end of the project interviews were conducted with members of the user-group as well as key stakeholders within the organisation, notably the head of energy services and staff responsible for communications and social media to review the use of the app. A semi-structured format was used and interviews were conducted in a location convenient to the individuals and were digitally recorded and professionally transcribed (see Table 2 for a full list of those interviewed).

4.1.2. The procedure

Case studies can be problematic, both in terms of case selection (how many for example?) and to some extent, controversial in terms of whether a single case study can produce knowledge that is generalisable. Both Flyvberg [26] and Dubois and Gadde [27] provide a robust defence for the use of single case studies being critical to the development of knowledge. Two specific points are worthy of note, especially given the exploratory nature of this research and the need for more examples of work-place engagement in energy initiatives. First, Flyvberg [26] notes that cases are important to develop a 'nuanced view of reality', and second,

[1] Further details of this interim evaluation can be found in [29].

that they are important for researchers' own learning processes. Reflections on this approach are made later as the unpredictable nature of such 'research in the wild' is an important lesson not just for conducting 'real world' social science research, but also in how competing work-place priorities affect not just the data gathering, but also the very nature of energy behaviours in the workplace.

For the analysis an approach was selected that would be most suited to a case study such as this. Systematic combining [27] is a relevant approach that refers to the particular process in which the theoretical framework (in this case public participation), empirical fieldwork (the user-group trial in the local authority) and case analysis evolve simultaneously. Using a process known as 'abduction' – as distinct from both induction and deduction – its purpose is to explore the relationship between 'everyday language and concepts' [27]. Coding of the transcripts was performed iteratively, grouping emerging themes around participation and experiences of using social media with themes in literature around the desire for greater participation in buildings amongst users, and the potential barriers to this. Emergent themes focused around how users engaged with the application to exploring the barriers to participation. This next section focuses on users' experience of the using application, and a consideration of the barriers, both individually and organisationally.

5. Research findings

Arnstein's ladder of participation and the e-ladder of participation provided an initial theoretical framework to explore where people are at on the ladders of participation, and what were the barriers to people (and the organisation) becoming more engaged. First, a reflection on the formation of the group is presented, before secondly, a consideration of the use of the Gooddeeds application and finally considering the barriers, at both the individual and organisational level, to this approach being more successful in this particular context. Finally, reflections and regrets to this approach are discussed in the conclusion.

6. Membership of the group

The success of a participatory approach is dependent upon getting the right people to attend. For this project the intention was to ensure representation of the full range of people involved in energy management in buildings – from ordinary building users, energy services team, the help desk, engineering and facilities management. Difficulties were encountered from the start with full access to representatives of the help desk, facilities management/contractors and the engineers being restricted. In part we believe this to be that as this project began, staff in property services (the directorate in which all of these roles sit) were identified as 'at risk' and began a process of re-organisation and possible staff redundancy. With regards to the contractors for example the team leader of Energy Services said they would not attend "*because they're just looking at, you know, this is our job, we complete that job, and that's signed off and that's the end of their sort of role*." He went on to admit though that they may have actually found it useful, "*the only bit that they [the contractors] may find useful is the user's point of view of what the problems and issues are*" (L1).

While this highlights the challenge of working through gatekeepers it also did not go unnoticed in the group. The role of the central estates' help desk and the lack of representation from it were of particular interest to the whole group. This being typical:

> I think someone from the help desk, being on a group like this would really help, because they're a very focal point aren't they? (L7)

The absence of people from the help desk and the engineering team from property services was especially frustrating as many in the group identified the process of having to report problems to "*an anonymous help desk*" (L3) as the key barrier to, and opportunity for, improving energy management across the councils. A couple of members however saw the opportunity of the user-group process, and the forthcoming web-application, to do "*away with the middleman, which is what we call the help desk*" (L4).

Of course not everyone was positive about the user-group experience and attendance was unpredictable at times. As noted above, one member was made redundant mid-way through the process and some members struggled to make each meeting due to work pressures. Other key sections of the organisation, such as members of help-desk, were not invited at the request of the local authority. For those who did attend though, some felt the meetings could have actually been more frequent (for example, "*I thought we were too far between meetings.. I would have preferred to have met a few more times in a short period and got it done quicker*" (L5), and that more could have actually been expected of the group, the Housing Options officer (L2) said "*I think if we'd had more sort of like specific tasks to do in between meetings so then we actually come back with what we've done in the meantime, I think that would have maybe got a bit more done*."

7. Using the Gooddeeds application

This section considers the user-groups experiences of developing and trialling the use of the smart phone application in the City Council and sets the scene for the barriers in fostering engagement in a local authority setting. As previously described, the user-group were issued with iPhones and encouraged to explore using them during the development phase of a bespoke application to help track, log and monitor energy management issues. From the start of the user-group it was clear there was limited interest or take-up with these technologies. The group were sceptical and concerned about social media and this was evidenced by none of the group using social media accounts for commenting on energy use and the clear recommendation that the app was to have a secure login so that only local authority employees could use it, and that comments made would be unavailable for public view. Nonetheless, the group were encouraged to post issues of energy or wider environmental issues for others to comment on. A member of the energy team (L7) for example posted this chart showing an unusual spike in water usage in the library over a weekend (Fig. 4) and below, the response from the librarian (L3).

Members of the energy team were disappointed though by the poor response of the user-group to posting and responding to issues. One of the team members (L7) said, "*I had to actually call the people to say I'd put something on, so I couldn't really depend on them to say that, you know, can you look and reply. And I also sent them an email just to make sure because if there is water leakage somewhere I need them to act quickly. So I had to make sure they were reacting*."

The energy services team leader (L1) agreed, "*I tried putting various things on at various stages but because there was no two-way communication.. It just felt like we were putting things in but nothing was coming back*." But he also went to admit that, "*I did use it, not as frequently as I would've hoped to, I guess*" (L1). Two members of the group did respond positively to using the tool though. One of the benefits of using a responsive web-app tool instead of a specific smartphone application was that users could use it either on their smartphones or from their personal computers. And it was here where there was actually more take-up of the tool, reflecting the working patterns and culture of the organisation. Many participants were desk-bound with access to a computer and less need of smart phone technology. Three users did however note the ability

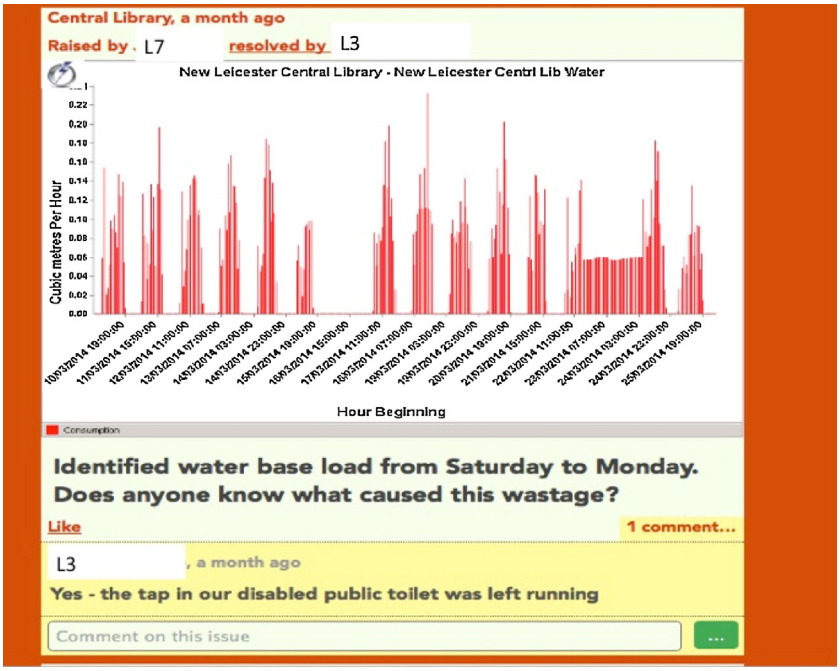

Fig. 4. A screenshot of the Gooddeeds application.

to take photographs and then send and receive via email or social media was beneficial. For example, L3 who, having said he would not use his phone, added, "*the only exception would be if I wanted to take a photograph*." The two other group members who had used the phone for taking photographs added:

> I must admit I have sent some photographs through Gmail and things like that to contractors. (L6)
> I take a photo on my phone and I'll send it by email to people. The good thing for me with this is that I don't have to go to the site now. (M3)

Another member of the group (L5) informed us that he had "*put an icon on my desktop for Good Deeds.. and I tend to look at [it] about once a week, usually after the weekend, because it's quite often if we're using too much water, someone's left something on over the weekend*." So whilst the user-group saw the potential in the technology, this did not translate into universal acceptance and use of the application. The final section considers the barriers to participation.

8. Barriers to participation

From the outset of the project a number of barriers emerged, some that we could have foreseen and some we could not have. This is the reality of the real-life case study work and it this unpredictability and messiness of 'real world' research that the authors have attempted to convey and will be reflected in the discussion. First, the fears over the privacy and trust at both the individual and organisational level, for example, the particular culture within the City Council towards digital tools are discussed before considering the wider barriers to participation that include a wider challenge to notions of responsibility towards energy in the workplace.

8.1. Perceptions of social media

Whilst the local authority was very supportive of the project, the reality of social media use, and its very public dimension was something of concern both to the user group and those with wider responsibilities and was never fully reconciled. The head of energy services for example acknowledged these fears from the outset when he sought internal approval for the project. He (L8) said, "*When I took the report to the directors' board.. the comments were all about who's going to deal with all the complaints that will come through as a result of this?*"

The membership of the user-group was not pre-selected with any prior aptitude for technology and it was clear that for the majority of participants social media and smartphones were quite novel; only two out of the six members of the focus group owned or had used a smartphone prior to the project, as opposed to the 60% ownership highlighted by the UK communications regulator, Ofcom. Members of the group were all aware of social media tools, but none were overly active on it. These responses were typical

> I just used Facebook to find out what my family is up to, and Twitter just to keep informed with some things. But I never tweeted until I joined this group. And I very rarely post anything on Facebook. (L3)
> So I like to read up and look at different things but I'm not too much of a 'putting things on to Twitter person'. And that's just because of myself.. I don't like myself being advertised too often. (L5)
> I'm not very good with Facebook, I'm now thinking I should have joined up when everybody else did but to me it was invasion of privacy, I wasn't gonna let anyone know what I was doing. (L7)

Common here is the concern around privacy and trust, as noted by Coleman et al. [17]. In this group people seemed unhappy with both 'oversharing' their personal details on-line, preferring instead to follow newsfeeds rather than actually post information themselves. A member of the digital media team in Leicester City Council who stopped using social media because of an incident involving a colleague of hers from another local authority highlighted privacy issues though as a real concern. She (L10) remembered, "*A colleague of mine used to post completely unprofessional things about her day.. it was communicated to the powers that be that she was doing this, and even though it was personal, in her own free time and those managers hadn't seen it, she was told that it was inappropriate*."

The user-group was also in agreement about the potentially negative affects of posting messages on other buildings and their users and customers (in the case of the library and leisure centre). People

are "*always trying to find faults or whatever*" said L6 from the leisure centre, and the participant from the library echoed the difficulty of getting constructive customer feedback. "*We welcome customer feedback as long as it's coherent customer feedback about things that we can actually do something about*" (L3). This was noted as particularly evident given the financial situation of local authorities like Leicester who have to make difficult decisions around budget cuts and had in fact gone through a redundancy process whilst this project was ongoing.

At the wider organisational level (Leicester City Council as a whole) too, the project uncovered a cautious approach towards social media. The City Council uses social media as part of its marketing and communications strategy including its own Twitter feed with over ten thousand followers. The main City Council account is managed by the Social Media Lead who was interviewed for this project. He says that "*it's very much geared around sort of headline corporate messaging really*" (L9) and was very keen to declare himself a fan of Twitter due it being 'instant', especially for news. He goes on to say, "*For finding out about breaking news Twitter is the place to be, and we're using that very much. We're even thinking about changing how we move our news provision media relations.. to using social as the main output*" (L9).

Of course local authorities are all about delivering public services within increasingly constrained financial budgets. This is a factor which will be revisited but here it is sufficient to say that the current use of social media by the City Council is determined by this key criterion: "*Unless it adds value to us and helps us deliver our services better, or helps people engage with us and those services, it's not going to make it as far as I'm concerned really*" (L9). There is conflict both internally and externally then. Internally employees are concerned about publicly highlighting areas of malpractice by other colleagues for fear there might be repercussions. Externally, colleagues are worried that if areas of wastefulness are highlighted then the public will seize on this information. One of the energy services team (L1) observed that, "*Public funds are always scrutinised a lot more and therefore you have to be careful in terms of how you sort of say something. You know, if you put something like, oh yeah, your site has wasted, you know, £20,000 worth of water in the last six months, you know, that wouldn't go down well on a public domain*."

Arnstein's ladder of participation moves all the way up to partnership to delegating power and control. This poses a challenge to the work place contract and is clearly an issue within a traditional organisational context such as a local authority? The head of energy services (L8) admitted that internal policies have "*excluded people from using social media for quite a time*," but he believed, "*things are changing*." There is a perceived difference between the elected members, such as Councillors and the Deputy Major having their own Twitter accounts and the employees within the council controlling the work environment and access to social media and mobile phones. These two examples are representative:

> If you went into a leisure centre or library and people were on their phones, members of staff, then the public would sort of say, well hold on, what's going on here? (L1)
>
> But up till now there has been 'you are provided with a computer to use at work' you know, 'you will only use it for work, you will not look at anything else or do anything else with it.' And that's, you know, very much how your work environment is controlled. (L8)

All those interviewed felt that there was something inherent in the nature of local authorities (not just Leicester) that affects innovation in this area. The head of energy services referred to them being "*very conservative about these sort of things but I think a lot of them are seeing the advantages of using it for various things*" (L8). This was noted for example with regards to IT policies and infrastructure, be it regarding using smartphones in the workplace, or simply being unable to get the latest web browser on their personal computers to wider approaches to change. A member of the social media team (L10) noted that "*Stereotypically local authorities are not terribly modern, and not necessarily that forward thinking*." She expanded on this point, observing that it has to do with change management, "*a lot of the staff that work here are not that keen on change.. actually getting services to consider having an online application is challenging. So if I went to them and said, 'Let's get tweets from your customers,' I think they would just explode*."

8.2. Competing workplace priorities

Of course the context of this research is energy behaviours, and it is here, within the workplace that there is a central question, and barrier for energy management in the workplace – who is responsible and who has control. Those interviewed exhibited a range of views as to where responsibility lay. "*I'm not in a job to do energy management, that's not my role*," said a business support manager, but, he went on to acknowledge, "*all management at a certain level should have that responsibility and a view to know that we're not wasting resources, energy in any way*" (L5). Most though agreed that it should both form part of responsible management and the culture of the organisation, as the Head of Energy Services (L8) described, "*the idea is that it is driven at a lower level, that it is something that is part of team briefings and that team leaders will identify if people have left equipment on and deal with them as they would with any other work type of behaviour. Just to ensure that it is in the culture of the organisation*."

However, whilst the Energy Services Team has an aspiration for responsible energy citizenship across the organisation, building users have differing perceptions. They often feel they have limited opportunity to really change anything and as is seen below, a wider lack of responsibility for energy spend, and competing priorities in the workplace mean that energy management is not at the top of their 'to-do list'. For many it seems the pressure of simply doing their job well means that energy is the last thing on their mind. As the Admin and Business Support leader (L5) observed, staff have conflicting responsibilities and priorities, "*they're more thinking about their day job and what we're doing and it's just tunnel, the vision's tunnelled into and the energy impacts are outside of that tunnel for me*." This lack of engagement with energy may be due to ignorance and general busyness, for some though, members felt that a lack of engagement with energy, and wasting energy may be a result of tensions and 'animosity towards management' whereby leaving your computer on overnight is a way of asserting control by 'screwing the system'. He (L5) went on to explain, "*It's a very stressful environment and it's very pressurised, I think some people just sort of see it as, well, screw the system, really. Again it's not really like, hey, you shoot them by leaving your computer on overnight, but I think it's that sort of childish mentality that affects some people*."

If at worst there are active feelings of resentment leading to wasteful energy behaviours, at best it seems that the fundamental disconnect between energy use and financial responsibility is a key barrier. The Housing Options Officer, appealing to notions of environmental citizenship wanted to believe that you can "*stimulate people to sort of do the right things, take the right social behaviour into account with regards to, if you won't do this at home, why would you do it in a non-office environment*?" He conceded though that, "*the bottom line of it comes to the fact that they're not paying it. If you were paying it you would be a lot more cautious with regards to how you use various things*" (L1)

Many of these issues would be common to a range of both public and private sector organisations. Rarely in organisations, are there devolved energy budgets, and most would accept that they feel (even if they are not), bombarded with conflicting priorities, increased workloads and seemingly limitless email inboxes.

Table 3
Examples of workplace issues affecting energy behaviours.

Supporting vulnerable users	The problem I think we've got across the board is the operational staff, so staff that have got other priorities rather than the building.. which is understandable because they've got an operational team which probably is usually quite a large operation team that could be supporting vulnerable service users, etc. or across the city. (L5)
	But they think, no, I'm employed as social worker or I'm employed as whatever it is, that's my responsibility. It's somebody else's responsibility to manage the heating and the cooling and the ventilation of this particular building. (L8)
Function of the local authority	We do attempt to meet and get to high standards with energy and energy management. But.. at the end of the day we're an authority and our main port is to look after the community and our constituents and the services that we have to provide. (L5)
'More with less'	The biggest challenge, apart from members of the public and our customers wanting more and wanting it 24/7, is the fact we are going to have to do an awful lot more with a lot less resource. So that's the number one priority really the city council has got, to still actually deliver our services robustly and resiliently with a far smaller resource given to us. (L9)
Job losses	The difficult thing is everyone has now got quite a lot of work to do. A lot of people are being made redundant. People are doing two or three jobs, and will people have time to look at this, or will they just carry on with their jobs. (L7)
	And so it is something that most people have an awareness of but they might feel less minded to, you know, if they feel under the threat of losing their job then it possibly isn't the highest priority on their mind. However it is a high priority on someone else's mind who might be their current manager or whatever. So it is still something that we try to drive through. It doesn't get discarded just because the public sector's going through a hard time and there are cuts. (L8)

A Local Authority context exhibits interesting features, not least in political and economic climates of reduced budgets; salary freezes and increased trade union activity. They are about delivering public services and value for money (see Table 3 for further quotes from those interviewed). It is against the backdrop of these competing organisational, institutional and political priorities that energy management sits and that place constraints on how much people will participate in energy reduction, especially those using innovative methods.

9. Discussion and conclusions

What lessons can be learnt then from this case study? Of course generalisations are limited and cautious but these findings are relevant both to the energy and behaviour debate and to the wider EU policy challenge of reducing energy consumption in public buildings. This was an exploratory pilot project designed to explore the potential for greater participation amongst buildings users and move beyond the use of digital tools for mere 'feedback' to attempt greater engagement. The project, only eighteen months in length encountered challenges that we have outlined, notably around financial cuts leading to job losses within the organisation and this created a challenging climate in which to conduct research project. This will be a familiar context for many organisations across Europe and will no doubt affect further initiatives. Seeing energy behaviour change initiatives as part of a wider agenda than just 'energy' may be one way to avoid this in the future. This is particularly relevant in local authorities, where the essence of the operation is public service. Of course all organisations have their primary goals – rarely is an organisation's raison d'être energy saving – but there exists a strong sense of duty to spend public money responsibly, and rightly so.

Recent research published in this journal has shown the importance of community in the workplace and the role of social norms forming within those groups. With hindsight it would have been better to try and foster groups within buildings and teams, rather than attempting a mix of employees from across different buildings. That said, one could not predict the twists and turns that occur in live situations, one can simply plan for more time and resilience in the project. Finally, it became evident that the project was actually implementing two significant changes – fostering greater collaboration *and* the smartphone/social media applications – more time was needed for this, given the levels of change implied, and a greater representation of people on the user-group would have helped enormously.

Social media and smartphone technology have a clear technical potential to contribute to low-cost solutions to energy management by moving beyond the information-deficit model of feedback and signs of hope have been highlighted here. However, attempting to 'climb' Arnstein's ladder of participation, be it a virtual one or not, poses challenges as well as opportunities to both individuals *and* organisations around notions of control, power and responsibility. For example, participation may require the 'non-expert' building users to take responsibility for switching appliances and lights off, where possible, but participation for the experts – those with designated responsibility for energy management – may result in a relinquishing of control which may be unsettling, especially in an uncertain organisational context. Both Arnstein's ladder and social media share a disruptive influence upon individual and organisational notions of control and responsibility.

If progress is to be made then barriers need to be overcome. All of our participants recognised the energy savings potential through fostering greater engagement, and yet for now our research supports the findings of Christina et al. [18] into energy behaviours in retail organisations in which organisational roles will always trump energy efficiency behaviours. For energy research to reach its potential much more work is required into understanding a wide range of organisation types and how different organisational contexts affect behaviour.

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