

# **PUBLIC ENGAGEMENT WITH COMMUNITY-BASED ENERGY SERVICE PROVISION: AN EXPLORATORY CASE STUDY**

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## **ABSTRACT**

While the adoption of an energy services approach is regarded as an important aspect of a low carbon economy, potentially involving greater consumer participation in delivering energy services, relatively few energy service providers (e.g. Energy Service Companies: ESCOs) exist in the UK, and little research has been conducted upon the kinds of beliefs associated with such organisations by members of the public, including ESCO customers. This research begins to address this research gap by means of a case study of a refurbished, mixed-use development in Linthwaite, Yorkshire: Titanic Mill. The project is notable for claims of carbon neutrality and lower fuel bills, the installation of low carbon technologies and intention to create a resident-owned ESCO (Mill Energy Services). Case study methods included content analysis of materials promulgated by the developers and a group discussion with residents. These suggest that Titanic Mill is characterised by passive rather than active roles for residents in delivering energy services, at both individual and collective levels. Some residents already express disappointment with actual bills, despite developers' claims. It is concluded that co-provision is unlikely to be achieved unless all actors (developers, energy consultants and residents) recast how energy services are conceived and communicated, both visually and verbally. Residents' enthusiasm for rethinking demand feedback, as well as some individuals' willingness to participate in the ESCO, suggest a platform upon which a transformation towards collective co-provision of energy services could occur, in the uncertain and dynamic contexts of a gradually emerging sense of community, and fluctuating energy markets.

## **INTRODUCTION**

*'We are looking at how to create a shared incentive between customers and energy suppliers to reduce energy use. We must look at how [energy suppliers] can change from just selling units of electricity to providing energy services –*

*heating and lighting homes – making it their business to increase energy efficiency and cut demand* (Darling<sup>1</sup>).

There has been an increase in interest in a systemic change in energy supply and demand in the UK, away from providing ‘units of electricity’ to a range of energy services including demand reduction activities. The provision of energy services is a challenge to existing ways of thinking about social, economic and technical aspects of energy, blurring boundaries between the currently rather separate domains of generation, supply and use. A transformation to an energy services approach has been advocated on several grounds, including facilitating the uptake of low carbon microgeneration technologies (e.g. micro-combined heat and power plant, solar photovoltaic panels and micro-wind turbines) as well as stimulating cultural change in the ways in which the role of individuals and households in the energy system is conventionally conceived, from that of ‘passive consumers’ to ‘co-providers’ of energy services (Van Vliet<sup>2</sup>).

Different ‘visions’ of the future of microgeneration in the UK have been suggested, described as ‘community microgrid’, ‘plug and play’ and ‘company driven’ (Watson et al.<sup>3</sup>). Although Watson et al. characterise these visions in terms of two dimensions (the degree to which consumers participate in energy service provision, ranging from passive to more active roles, and secondly, the degree to which private sector companies drive, or merely back-up, service provision), there is a third dimension latent to their analysis: the scale describing consumer participation (where the service provider is conceived to be at the micro level – the individual or household, or at the meso level - the collective or community, or a mix of these).

Reference 3’s visions reflect the variety of possible futures for delivering energy services and installing microgeneration. Whilst some are quite similar to today’s typically passive consumer role (e.g. ‘company driven’), others depart radically from the large-scale private sector-led utilities that predominate in today’s energy system (e.g. ‘plug and play’). Drawing out the third dimension of level of analysis (see table 1), it can be seen that in more participatory visions of microgeneration futures, where people play a more active role in providing energy services, both the provider and the receiver of energy services can vary between individual and collective levels. In an individualised future, the locus of provision is predominantly at the consumer or household level, and energy services are traded from household to household, or perhaps from households to a collective entity such as a community-owned ESCO (similar to Ref 3’s ‘plug and play’ vision). In a more communitarian vision, individual households might receive energy services from a collective that they are members of (i.e. from collective to person, similar to Ref 3’s ‘community microgrid’ vision) and this may also enable inter-collective service provision (from collective to collective).

Whilst some of these possible micro and meso-level combinations of participatory energy service provision may seem unlikely in light of past conceptions of the energy system, this may be far less so in a future where distributed energy generation becomes more commonplace. The reason for this is that many people view a shift downwards in the scale of energy generation technologies as co-evolving with a shift upwards in the degree of active participation of individuals and collectives in the energy system.

**Table 1. Different forms of participatory energy service provision at individual and collective levels of analysis**

		Energy service receiver	
		Individual or household level	Collective entity
Energy service provider	Individual or household level	Person to person	Person to collective
	Collective entity (e.g. a community cooperative)	Collective to personal	Collective to collective

The following quotation from the Energy White Paper (Department of Trade and Industry<sup>4</sup>), is notable for this conflation of social and technical aspects of energy services, mixing smaller scale technologies with a ‘community-based’ energy system (admittedly a rather vague concept), with the potential outcomes of more sustainable patterns of energy consumption:

*A ‘distributed energy’ system, using these technologies could radically change the way we meet our energy needs in the long-term. Heat and electricity can be created locally from renewable resources .... local generation allows us to capture the heat generated in the process and use it nearby .... And a more community-based energy system could lead to greater awareness of energy issues, driving a change in social attitudes and, in turn, more efficient use of our energy resources (page 14-15).*

Since 2000, there has been increasing expert and policy interest in promoting a more active role for communities in developing renewable energy technologies (e.g. Palmer<sup>5</sup>; Royal Commission on Environment and Pollution<sup>6</sup>; Hain, Ault, Galloway, Cruden and McDonald<sup>7</sup>; Walker, Devine-Wright, Evans, Hunter and Fay<sup>8</sup>), where communities are typically conceived as collectives of individuals dwelling in a particular place. Such policy interest is manifest by the development of public sector funded programmes that have sought to provide capital investment, advice and support to communities wishing to conserve or locally generate energy (e.g. Clear Skies/Low Carbon Buildings programme; Community Action for Energy; the Community Renewables Initiative). Simultaneously, there have been calls for the more active involvement of individual consumers in energy service provision (e.g. Morris<sup>9</sup>; Collins<sup>10</sup>; Greenpeace<sup>11</sup>). Such calls have chimed with advocacy for more participatory roles for consumers in providing services of many kinds, from health to education (e.g. Halpern, Bates et al.<sup>12</sup>). Thus, there are some signs of a shift in the way in which the role of the individual is commonly conceived in relation to energy systems, from the rather passive and individualistic notion of an ‘energy consumer’, towards a more participative and communitarian notion of an ‘energy citizen’ (Devine-Wright<sup>13</sup>). However, whilst a literature on community based renewable energy developments is beginning to emerge (e.g. Reference 8), to date there has been comparatively little attention paid to community based energy service provision. This paper aims to address this gap.

In contrast to the variety of possible futures sketched above, actual examples of energy service provision in the UK are relatively rare. In 2005, it was estimated that there were only twenty company-driven energy service providers (known as Energy Service Companies or ESCOs) in the UK (Bertoldi, Rezessy and Vine<sup>14</sup>), although this figure may be higher as there are different criteria for defining ESCOs (for example, Jones, Wade and Barton<sup>15</sup> identified more than 25 ESCOs that had received funding from the Energy Saving Trust). Whilst many service providers are led by the private sector, some are led by local authorities, often in partnership with businesses (e.g. Thamesway/Woking), whilst a very small number may be more accurately described as community-based energy service providers, notably at the Findhorn community in Scotland where a locally-owned utility manages a private wire power distribution network, generates wind energy on-site, bills local residents and promotes energy conservation behaviours (Devine-Wright<sup>16</sup>). This range of services indicates how the providers may create 'added value' in a number of ways, attempting to differentiate an otherwise seemingly homogeneous commodity (e.g. electricity) or attempting to differentiate themselves as organisations from conventional energy providers. Such distinctiveness could take a variety of forms, including the delivery of 'green' (i.e. renewable) energy, energy that is locally generated and employing more participatory modes of customer engagement.

To date there have been very few academic studies of energy service provision (Sorrell<sup>17</sup>). Perhaps due to the relative scarcity of service providers, the literature is characterised more by analyses of the slow development of ESCOs in the UK, rather than more evaluative case-studies of actual energy service provision. Ref 3 identify six principle barriers to energy service provision, including the 28 day rule that prevents longer term contracts, risks to profitability, consumer mistrust of companies' motives for investing in energy saving and aversion to long-term commitment to a particular supplier. These barriers to ESCO development are diverse, encompassing economic, regulatory and social aspects, and chief amongst the social barriers are issues of trust with regard to conventional utilities and the perceived risks and benefits associated with extended contract duration. The relationship between customers and ESCOs was explored by Poole and Stoner<sup>18</sup>, who stressed the importance of beliefs about equity and fairness in decision-making about financial paybacks to customers. The authors noted that customers may perceive an ESCO to be making too much money from them, arguing that this may result in adversarial relations. However, what customers judge to be a fair or reasonable cost for their energy will also be influenced by how they perceive the energy service that the ESCO provides.

One factor that may mediate such concerns is the degree of engagement between energy service providers and their customers. In situations where service providers adopt more participatory modes of customer engagement, and this will be especially prevalent in contexts where customers themselves constitute the energy service provider (i.e. a community-based energy service company or social enterprise), one might hypothesise higher levels of support for pricing arrangements, in a similar manner to recent research findings on the acceptance of community based renewable energy initiatives (Walker and Devine-Wright<sup>19</sup>; Devine-Wright, Walker and Hunter<sup>20</sup>). However, this still leaves many questions to be answered. Whilst it might be expected

that consumers would mistrust conventional utilities that attempt to re-cast themselves as ESCOs, we currently have little knowledge regarding how consumers might respond to a novel energy institution, particularly one that claims to promote more participatory modes of service provision at the collective level of analysis. Even were opportunities for participation to be provided, it not clear whether individuals would wish to voluntarily take up such opportunities, given the prevailing sets of beliefs and norms about utilities as organisations ‘just selling units of electricity’ (Darling<sup>1</sup>).

Since the research base concerning ESCOs is rather small (Sorrell<sup>21</sup>), it is timely to explore social aspects of energy service provision in more detail, specifically investigating how developers and residents engage with each other about the issue of energy services. With this aim in mind, this paper is an exploratory case-study of actual energy service provision in which two main sources of data are drawn upon. Firstly, the range of symbolic meanings (environmental, social and economic) that were used by a developer to engage with residents about energy services is subject to analysis. Secondly, the beliefs of actual residents about energy aspects of the project were captured and analysed. Both of these are summarised below, preceded by a brief description of the research context.

### **TITANIC MILL**

Titanic Mill is an innovative, mixed-use development in Linthwaite, West Yorkshire. It is a refurbishment project of a 6-storey building constructed in 1911, the same year as the ship of similar name. The lead developer on the project is Lowry Renaissance, a subsidiary company of a large-scale housing provider, in partnership with organisations including the local authority - Kirklees Metropolitan Borough Council (MBC), Energy for Sustainable Development and B9 Energy Services. The Mill has been converted into 130 apartments and ground-floor business accommodation, including a Spa complex and a restaurant. Of particular relevance to this research is the fact that the development features on-site low carbon microgeneration technologies and is constituted as an ESCO (Mill Energy Services) that, following the withdrawal of the lead developer upon sale of all dwellings, will be collectively owned by the Mill’s residents and contracted to supply ‘carbon neutral’ power and heat to the homes and businesses on site.

According to the ‘sustainable energy brochure’ produced by the developers (Lowry Renaissance<sup>22</sup>), the building has been insulated to a high level and renewable energy technologies installed, including roof-integrated solar photovoltaics (PV) producing an estimated 48,000 KWh of electricity per annum. One of the partner organisations, Kirklees MBC, was applauded at the Ashden Awards for Sustainable Energy in 2006, in part because of their role in the Titanic Mill project. This role was facilitated by EU funding through the SunCities project, which aimed to install solar PV panels on 2000 homes in the UK, Germany and the Netherlands. A biomass fuelled district heating system, using a combined heat and power plant and heat metering for all apartments, was also planned, after all of the building’s apartments have been sold. The building is grid-connected, with individual gas boilers in each apartment currently providing heat to residents until the communal system comes into practice. In terms of demand management, in the lobby of the building, a large display panel has been installed that

features a digital display recording power production by the rooftop solar panels. The residents receive energy bills on a quarterly basis, which detail heating and electricity costs along with separated out standing and services charges.

Institutionally, the developer set up an Energy Service Company to supply heat, power and water to all building residents. As characterised by the 'BOOT' contractual model (Build-own-operate-transfer, Bertoldi and Rezessy<sup>23</sup>), the developer will withdraw from service provision following sales of all apartments in the Mill, when ownership will be transferred to Titanic Mill Management Company, and in the process directly to the residents themselves. At the point of purchasing their apartments, residents signed contracts with 'Mill Energy Services' and received a copy of a 'sustainable energy brochure' that contained information about climate change and specific energy aspects of the development, a brochure that is also available to download from the project's website (Lowry Homes<sup>24</sup>). As of April 2007, there were approximately 60 apartments sold and occupied at the Mill, and residents had been invited to two evening meetings held in the building to discuss the provision of energy services to the building.

### ENERGY SERVICES FROM THE DEVELOPERS' PERSPECTIVE

Visual and verbal materials that were created by the development partnership and available from the Mill's website are used as a source of data. These materials are conceived to provide information about the symbolic meanings that the developers chose to communicate about energy services in a strategic manner to potential residents of the Mill. Quoted text from the website are printed in italics below. The project's homepage features the following text, claiming that Titanic Mill provides:

*'luxury apartment living, in a majestic Grade II listed country mill, enjoying a peaceful, waterside location near Huddersfield'*

Counterpoised with this claim, the home page contains a sequence of colourful images describes the exterior and interior of the Mill building. These highlight the building's scale as a structure, its rural setting in the Colne valley, and the contemporary styling of its interior spaces. From the homepage, further verbal and visual details about the development are segmented into three categories: 'history', 'smart homes' and 'sustainable energy'. In the 'history' webpage, black-and-white photographs are used to convey the historical significance of the building, while the text provides anecdotes about the building's 'grand opening' and makes claims about the popularity of modern makeovers of historical buildings, seamlessly linking the past, present and future:

*'This combination of yesterday's commercial architecture with tomorrow's interior specifications is totally in tune with today's home buying demands'.*

Under 'smart homes', the developers profile the diverse technologies available to homeowners at Titanic Mill, encompassing systems for entertainment, security and communication.

*'All apartments currently on offer at ... the Titanic Mill ... bring purchasers the option to enjoy "tomorrow's world" convenience and security'*

Headings such as 'entertainment distribution', 'complete convenience', and 'style and flexibility' suggest social values of self-enhancement and hedonism. (Devos, Spini and Schwartz<sup>25</sup>) In the smart homes section of the website, energy issues are not mentioned. With the visual images illustrating a variety of technological controls and systems, including a wall-mounted flat screen TV system. There is also an image of a smiling, female apartment dweller pressing a control feature. Under the heading of 'economy', the text suggests that systems will avoid overheating rooms, thus framing overheating as an issue of economics or personal comfort rather than an energy issue with environmental implications. Furthermore, despite the emphasis upon 'smart home' technologies, there is no mention of any type of 'smart metering system' in the apartments (Devine-Wright and Devine-Wright<sup>26</sup>).

By contrast, in the section concerning 'sustainable energy', very different visual images are used, all featuring outside locations and none featuring apartment dwellers. Whilst electricity pylons are depicted against a dramatic blood-red sky, by contrast, solar PV panels are depicted alongside a deciduous tree, reflecting a blue sky and a third image shows a helmeted construction worker standing alone beside a drilling rig, framed by a blue-sky background. The text begins with reference to global warming:

*'There are many arguments put forward for the causes of our rapidly changing climate. However, most experts agree that the main problems behind global warming are caused by increasing amounts of carbon dioxide (CO<sub>2</sub>) being released into the atmosphere'*

Having emphasised the opinions of 'most experts' in relation to the 'problem' of global warming, the text then describes the developers' response:

*In response to the climate change challenge, the apartments at Titanic Mill will be CO<sub>2</sub> neutral and Lowry Renaissance is working with ESD consultants with the aim of making the whole of Titanic Mill CO<sub>2</sub> neutral. CO<sub>2</sub> neutrality for the apartments will be achieved by a combination of high levels of energy efficiency and the supply of renewable ('green') energy. This will deliver lower heating and electricity bills for residents and benefit for the environment'*

In the text, the phrase 'CO<sub>2</sub> neutral' or 'CO<sub>2</sub> neutrality' is mentioned on three occasions, yet neither is explained nor defined, nor is any explanation provided for the distinction between 'CO<sub>2</sub> neutral apartments' and 'the whole of Titanic Mill'. Consultants are cited as partnering the lead developer, presumably in an attempt to demonstrate domain specific expertise that may increase trust-worthiness to prospective purchasers. Affirming that no compromise is required between addressing global environmental problems and providing benefits to homeowners, the text continues:

*'Visitors to Titanic Mill may never be aware of just how unique a community the building actually houses, but residents will be constantly re-assured that their lifestyle decision provides benefits to themselves and their families which are simply unobtainable in any other location, and that their water, heating and electricity bills are lower than in less well planned conversions without Titanic Mill's energy-saving technologies'*

The environmental claims made by the developers are notable for their lack of detail and confident assurance that luxury living and high levels of environmental concern are entirely compatible. There is no suggestion that addressing climate change might necessitate any change in lifestyle or decrease in personal comfort. The phrase 'CO2 neutrality' is repeatedly cited, yet no reference is made to the direct consumption by homeowners of energy for transport. However, the development features an extensive, gated private parking facility for homeowners as well as visitors to the Spa and restaurant. Economically, there is a strong claim that homeowners at the Mill will have lower water, heating and electricity bills. Yet close scrutiny of the text suggests the caveat of comparison to '*less well planned conversions*'. Whilst the vision provided of 'luxury living' is founded upon 'smart', futuristic technologies, these reflect systems for personal communication, security and comfort, not engagement with energy. When energy issues are communicated, the absence of any symbolic connectivity with homeowners is notable.

In sum, visual and verbal materials used by the developers fail to credibly suggest a conception of the residents as energy service *co-providers* (Van Vliet<sup>26</sup>), either at the individual or collective levels of analysis. Instead, the materials suggest the more conventional, individualistic and passive energy consumer role, more similar to Ref 3's *company-driven* vision of energy services despite intentions to transfer ownership of the ESCO to the residents. These suggest that energy is a predominantly technical issue that Mill dwellers need not be directly engaged in, save personal concerns with comfort and cost savings. Where wider environmental problems are implicated, these are claimed to require no direct engagement by residents, and no compromise to personal lifestyles.

### **ENERGY SERVICES FROM THE RESIDENTS' PERSPECTIVE**

To explore how the residents themselves conceived energy service provision at the Mill, the first author attended a meeting held in April 2007, called by the developers, to which all apartment owners at that time (approximately  $n = 60$ ) had been invited. This meeting was one of a series organised to promote resident engagement with energy services. At the meeting, eight individuals participated in a discussion of climate and energy issues, which was led by an energy consultant involved in the development. Some of the residents had attended a similar event run by the same consultant some months beforehand. With the permission of those attending the meeting, the first author acted as an observer to the process, taking notes as the discussion, which lasted over 2 hours, unfolded. The content of group discussion is captured and interpreted under several thematic headings below. Text in italics represents the actual utterances of residents, presented in an anonymised form.

The participants reflected the diversity of owners at Titanic Mill: they included buy-to-let landlords, younger professionals and retirees. At the time the research was carried out, the participants had been resident for up to 3 months and the development as a whole was clearly incomplete. Although energy was a topic of common interest, this interest was motivated by diverse concerns amongst the residents: sometimes ecocentric (addressing climate change) and sometimes biospheric value orientations (de Groot and Steg<sup>27</sup>) addressing energy security and seeking lower fuel bills.

### EXPECTATIONS OF LOWER BILLS

Several residents expressed disappointment that their bills were not as low as they had been expecting. As one man remarked:

*'These bills, there's service and standing charges on everything. Mill Energy Services have really let themselves down. There's something the matter there. Why so many charges? It's a lot of money off us'.*

It was notable that the energy consultant consistently avoided using the same form of words as used on the project's website in discussing energy costs. In response to concerns about the actual costs of residents' bills, the consultant emphasised that residents' energy bills would be no higher than that delivered by a conventional utility, rather than the affirmations of 'lower bills' communicated in the web materials. This is a different position from that promulgated in the promotional materials for the development, and one suspects, a more valid claim to make. The quotation is also notable for the way in which Mill Energy Services, as an organisation, is referred to as 'themselves' in contrast to 'us'. There is little sense that the speaker feels any sense of personal connection with the ESCO. This again suggests a passive 'company driven' vision of energy services, rather than the more participative 'co-provision' role for residents.

A challenge for residents' expectations of lower heating and electricity bills is how the services approach builds in charges to customers across time to enable the operation, maintenance and eventual replacement of heat and power systems. Since the residents are unlikely to have received bills with such charges listed on them when living in previous dwellings, the bills themselves will appear different, containing many more charges than might have been expected in a place strongly associated with 'lower bills' by the project developers. The negative responses by certain residents highlighted a gap between expectations of lower bills and the reality of additional charges for ESCO heat and power. This is not so much an issue of how to present these charges in the bills (as one lump sum or broken down in many smaller ones) as a need to enable a different approach to energy management by the residents. This was illustrated by one resident who countered concerns over energy bills by calling upon her personal experience of working in personal insurance to explain to her fellow residents how the ESCO might actually work:

*"one of the selling points (of Titanic Mill) is the continual budget rather than having to pay 1000 pounds if the boiler breaks down and having to deal with*

*leaking pipes. It's one of those things you don't think about until it happens'.*

Signing up to Mill Energy Services implies the adoption of an alternative means of managing energy technologies, putting aside money over time to cater for technology replacement when necessary. From the discussion group, this fact was not well known to some residents for whom it represented a challenging departure from prior expectations. As Biermann<sup>28</sup> noted, there is 'little evidence that customers think in terms of payback' (p 437).

### **RESIDENTS' CONCEPTIONS OF DEMAND MANAGEMENT**

During the discussion it was suggested that the 'sustainable energy brochure' provided to residents at the point of sale had only limited value in engaging residents about energy and climate change. As one woman said:

*"They give you the stuff in the beginning when you've six zillion things to read. It's not as understandable as what you've just said. Why not give a simple introduction to new residents? It didn't come alive like when you say it".*

The discussion indicated that the residents valued in-person energy communication far higher than brochure-based communications, in order to 'make it come alive'. Residents clearly trusted the energy consultant, were interested in what he had to say and valued his opinions. There was a belief that brochures 'don't put it in layman's terms' and that there was minimal engagement with residents: 'all that stuff that was given to us – it just went straight over our heads'.

At the meeting, the energy consultant provided feedback to the residents about recent consumption levels of heat and power in one and two bedroom apartments in Titanic Mill. Data in the form of tables representing 'typical' apartments, although actual data for 'highest' consuming apartments was also provided. This exercise generated significant interest amongst the residents as they sought to learn more about their own patterns of energy consumption and to make sense of this in the context of other residents' consumption levels. There was a strong sense that more frequent and more detailed feedback information, provided by Mill Energy Services, would be of interest to residents, who were quickly interested in details such as whether occupants of a 1-bed apartment could have higher levels of electricity consumption than those in a 2-bed apartment, or whether those on one side of the building might have lower consumption levels (due to solar orientation), than others.

The socio-technical nature of feedback of this kind was evident in the beliefs held by residents about shaping social norms about 'optimal' behavioural patterns. Two methods were specifically recommended by different residents:

- A punitive 'Name and shame' procedure and
- A reward system of 'Giving gold stars'

Whether anchored in wider beliefs about school education or national politics, each of these ideas represent ways of creating and regulating a new social norm for energy

consumption behaviour at Titanic Mill amongst the community that either rewards 'good' behaviour or punishes 'bad' behaviour. Whilst one resident felt that completely open reporting of all apartments' consumption data was the best way forward, another expressed misgivings about showing data that could enable individuals to be identified. The discussion suggested that, regardless of the emphasis upon 'luxury living' at the Mill promoted by the developers, residents were willing to put a social system into place intended to influence residents' energy consumption behaviour, using feedback, and were prepared to engage in a debate about the form that such a system could take, such as an annual 'award ceremony' for the 'best' (i.e. least consuming) residents.

### ESCO DECISION-MAKING

The fact that even a small group of residents have different views about how energy feedback could be designed and provided suggests the scope of the challenge involved in governing a residents-owned ESCO. Whilst this is currently in abeyance until the developer pulls out of the project following sale of all properties, when transfer occurs, a resident-led institution will be set up that will have to take responsibility for energy and water supply to the Mill.

Aside from the details of feedback provision, residents held different views about the setting of energy prices at the Mill in contexts of rising or falling energy prices. Whilst one resident advocated: *'if we do get falling costs, I'd like to keep that surplus'*, another preferred to pass those falling costs straight to Mill customers. Surpluses caused by falling energy prices could be used to payback the costs of capital investment earlier, much like overpaying on a mortgage. This would effectively shorten the payback period, however, its benefits may be felt more by future rather than present building residents. However unlikely the scenario of falling energy prices, the issue does raise the issue of the temporality of energy service provision, and how a collective that has diverse characteristics (young professionals, buy to let landlords or retirees) can reach a consensus on the setting of costs of energy service provision.

The ensuing discussion indicated that different values shape residents' beliefs about the temporal distribution of benefits from the ESCO. These beliefs were also contingent upon how long apartment dwellers expected to be resident in the Mill. Those paying rents on a relatively short-term basis may want to ensure the lowest bills possible at the present time, whilst those intending to live in the building for more than 10 years may prefer to take a longer-term position. Regardless of which option is agreed by the residents, the discussions illustrated how residents had adopted the expectations of falling rather than rising energy prices that had been promoted to them by the developers. As Hansen<sup>27</sup> has noted, when customers perceive an ESCO to be making too much money from them as customers, this can result in adversarial relationships. The cost that a single customer or group of customers judge to be 'fair' or reasonable for their ESCO-supplied electricity will be influenced by how they both perceive and experience the energy service that the ESCO provides.

Beyond issues of information provision or price setting lie the detail of what structures and procedures are put into place to enable residents to participate in the ESCO when the developer departs. Attendance at the residents meeting was quite low,

as was awareness by those who did attend of the community-based nature of Mill Energy Services. This suggests that, in future, active involvement by residents is unlikely to occur unless participation is far more strongly emphasised as intrinsic to the delivery of energy services at the Mill. This requires that social aspects of energy technology installation and management be conceived differently from the current mode, which emphasises active engagement with issues of personal comfort and cost by residents, yet disengagement with systems of energy provision. In terms of decision-making, one resident declared that procedures '*should be open and democratic*' suggesting that whilst a small group of individuals are actively involved in managing the ESCO, when key issues such as price setting emerged, all residents could vote on which option they preferred. None seemed aware of whether such details have already been considered or decided by the developer. However, there do seem to be a small number of interested residents, some of whom have previous experience participating in residents associations, who could take an active role in community based energy service provision at the Mill.

## CONCLUSIONS

Despite indication of high-level Government support, the energy services approach has been slow to develop in the UK (Ref. 23), despite the fact that, as organisations, they have the promise to play multiple roles - providing reliable and competitive heat and electricity, at affordable prices, and encouraging energy conservation through customer feedback. The Titanic Mill development in Yorkshire is even more distinctive for the fact that it combines 'green' and 'local' energy service provision with claims for participatory forms of governance. This combination is a heady cocktail of social, environmental and economic aspirations. To what extent are such aspirations being realised? Certainly, the developers have succeeded in refurbishing a listed building with high levels of insulation and the installation of renewable energy technologies. Yet this installation has been part subsidised by the EU as part of a solar energy project, and the developer's claims feature an obvious tension between the claimed low-cost, luxury living delivered to residents by means of futuristic 'smart' technologies and the challenge of global warming. There is little sense that the developers are prepared to challenge any apparent contradiction between their residents' affluent lifestyles, the delivery of 'CO<sub>2</sub> neutrality' and the cost of energy services. Nor is it clear how such luxury living is consistent with a more participative co-provider conception of the role of residents in the Energy Services Company.

Whether the developers' vision of a low cost, yet 'green' energy development ultimately takes place remains highly uncertain at this point, when only half of the apartments have been sold, the biomass heating system is not yet on stream, and the transfer of ESCO ownership to the residents has not yet taken place. What is more certain is that Mill residents are motivated to engage with detailed feedback concerning their patterns of energy consumption behaviour, suggesting that the provision of enhanced demand side energy services will be met with interest and engagement, and the potential to change patterns of consumer behaviour. The billing issue is more problematic. Currently, some residents find the energy bills both too complex and disappointingly high, given prior expectations. It seems impossible to

reconcile the possibility of higher fuel prices in the future with maintenance of the developer's promise of lower energy bills due to energy saving technologies.

Moving forward, developing Mill Energy Services is constrained by many factors, notably the speed of apartment sales, which delays transfer of the ESCO to residents, the installation of the biomass CHP plant as well as the forming of a new community of residents at the Mill. To progress the ESCO, and overcome current perceptions of disconnection between residents and the organisation, the development team (and perhaps the local authority specifically) will need to convincingly put forward a case for the 'co-provider' role for residents, in contrast not only to the prevailing norm, but also to the way in which energy service provision seems to have been initially conceived and communicated at the Mill. Doing so will necessitate further input of trusted technical experts (and certainly not just information brochures) to 'make energy come alive', providing details of the biomass CHP district heating systems and solar panels in lay terms. It also requires social expertise in fostering a sense of community amongst new residents and encouraging greater individual and collective engagement with energy generally and the ESCO specifically, enabling diverse residents to attend meetings and to reach agreement on future plans and prices, despite different priorities, interests and values.

Due to the manner in which the developers have marketed the Mill to residents as a place symbolic of 'luxury living', with attendant expectations of hedonistic personal experiences, at the moment this seems a challenge rather unlikely to be met. However, there are grounds for expecting some residents, whether motivated by concern for climate change, social welfare or the desire for lower fuel bills, to actively engage with a community owned ESCO as it develops. Given that Titanic Mill is clearly both a development and a community in process, it would be beneficial to complement this research with a follow-up study at the Mill, for example at the time-point of transfer of ESCO ownership to the community, to investigate in a more detailed manner the nature of residents and developers' beliefs about energy service provision at that point.

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