Rhythms and patterns of daily life from 1950–2000: the changing qualities of energy demand

Nicola Spurling
The DEMAND Centre
FASS Building
Lancaster University
Lancaster, LA1 4YD
UK
n.spurling@lancaster.ac.uk

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Abstract

Walker (2014) argues for the relevance of conceptual tools from the sociology of time for understanding the dynamics of energy consumption. This paper takes up this idea to analyse empirical data on Stevenage new town, focussing on how rhythms and patterns of daily life have changed since the 1950s (when the town was built), the role of institutions and infrastructures in shaping these rhythms, and their relationship to infrastructure-in-use.

The starting point is the idea that energy services (such as heating, lighting and moving around) are consumed to accomplish social practices (Shove and Walker, in press) and that the temporal patterning of these practices – their rhythm, synchronicity, periodicity and duration – is generative of patterns of demand. To provide an example, in his book 'The Seven Day Circle' Zerubavel (1985) shows how the week imposes a rhythmic beat at a societal scale on the ordering of work and leisure activities. Such orderings have inevitable effects on what energy is used for across the day and week, and related peaks and troughs in demand. At a broad level this is understood by energy companies who have knowledge about the desynchronised demands of their large industrial customers. Much less is known about the changing detail of daily life which constitutes rhythms and patterns of demand, the role of institutions and infrastructures in shaping when people do what they do, how such temporal arrangements are reproduced and transformed, and the implications of such rhythms for patterns of infrastructure-in-use. These are the concerns of this paper.

Stevenage was the first new town to be built in England in the post war period. Originally a village of 6,000, the town was totally planned in the mid-late 1940s to accommodate a new population of 60,000. Drawing on archival research and oral history interviews with Stevenage residents, the paper provides a detailed account of the changing rhythms and patterns of everyday activity, and how institutions and infrastructures co-constitute these temporal arrangements. The paper concludes with initial reflections on the implications of this research for understanding how patterns of demand are constituted.

Introduction

The reworking of the relationship between energy supply and energy demand is increasingly seen as key to reach decarbonisation targets. In particular, the expectation that supply will continue to meet increasing and varying energy requirements in the future is being reconsidered in light of demand-side policy and practice, which is expanding beyond well rehearsed ideas about energy efficiency. The work of the DEMAND Centre (www.demand.ac.uk) is contributing to these demand-side developments by taking as its starting point the fundamental (yet often unasked) question 'what is energy for?' (Shove and Walker, 2014). This fundamental question forces us to acknowledge that energy is not used for its own sake, but to accomplish social practices at home, at work and in moving around.

This conceptual shift forms an important premise in this paper which focuses on the patterns of such energy-demanding practices in daily lives (Walker, 2014). The paper takes a historical look at what we do on a daily and weekly basis, where we do it, and how this is related to energy being drawn through the infrastructure. Crucially the paper explores how such patterns

are shaped and made at the intersection of institutions, infrastructures and technologies. It is work-in-progress, and in the coming months we will be considering how these insights have potential for practical efforts to reduce and manage peak loads in energy and mobility.

Another way to frame the paper's central concern is to note that the everyday practices which consume energy have rhythms and patterns – they happen at particular times and places. These rhythms and patterns change across time – a phenomenon that can be observed at a societal scale (Southerton et al., 2012). The idea of studying such rhythms is set out by Lefebvre (Lefebvre, 2004). In this paper I draw on the idea of rhythm to conceptualise and analyse how the daily and weekly activities of households change across time. Throughout the paper I also draw on concepts from Zerubavel's (1985) work which sets out a sociology of time, in particular concepts of duration (how long particular activities last for), sequence (the order in which particular activities are done) and temporal location (where in the day or week activities are located) are relevant for the analysis that follows. Further, as Lefebvre notes "… all rhythms imply the relation of a time to a space … or if one prefers, a temporalised space" (2004: 96), and within this paper spatial as well as temporal location of activities (when *and* where within the home people do things) is of interest.

The relationship between rhythms and patterns of practice, and patterns of energy demand is not direct. Rather, it depends on whether and how technologies are part of practice performances. The role of technologies in specific practices has changed across time, and so, as we might expect, the relationship between practices, levels of energy demand, and the kinds of fuel demanded has changed too. For example, contrast heating a 1950s home with a solid fuel fire, which generally involved heating just one room using wood, coal, coalite etc. with gas central heating in which all the rooms of a home are heated, and gas rather than solid fuel is demanded. To complicate things further the availability of and interfaces with infrastructure have changed too, in relationship with (though not deterministic of) where we do various activities. A final complication to mention here (though there are likely many more) is that new technologies do not just 'electrify' or 'gasify' etc. practices that previously drew on other forms of energy (another fuel type or from a person), but actually reconfigure entire sequences of activity in the day and week, *and* make multi-practicing (i.e. doing more than one thing at once) possible.

For these reasons, as well as considering the activities of daily and weekly schedules at different historic moments (and where/when/ how they were done); and, analysing how domestic infrastructures and technologies also change; a third consideration of the paper is the *infrastructure-in-use* (Shove, forthcoming) – the patterning of energy being drawn through the infrastructure, or (in the case of transport) of people moving through the infrastructure. The ultimate aim of researching changing patterns of practice and infrastructural change is to shed light on the question of how and why infrastructure-in-use changes over time. Understanding changing energy demand in this way promises some alternative starting points for envisioning future demand.

The research presented in this paper is about homes and daily/weekly life between 1950 and 2000 in Stevenage new town, focussing on how the energy infrastructure and spaces of the home changed; how these changing homes were part of daily and weekly schedules; and, the relationship between these patterns of daily and weekly activity and the 'infrastructure-in-use' (Shove, forthcoming). The empirical data collection was completed in December 2014. The paper presents initial analysis of empirical materials to make three arguments. First of all, the place of home in daily and weekly routines has implications for domestic infrastructures-in-use, therefore to understand domestic energy use we need to understand how the home is part of the flow of life both at and away from home. Secondly, patterns of infrastructures-in-use are reliant on an increase and dispersal of opportunities to consume (e.g. of electric sockets, television points, wireless internet) which result in the spreading out and multi-practicing of households when they are at home. Thirdly, the relationship between infrastructures-in-use and patterns of activities of household members is not direct, rather to understand changing patterns requires us to think about how technologies are implicated in the performance of practices, and how that has changed across time.

Research Design

Site of Study

Stevenage formed our case study site. A new town in South East England, Stevenage was planned in the late 1940s as part of the Greater London Plan, which was concerned with improving the housing conditions of the London Population after World War 2. Our interest in Stevenage is two-fold. First of all, the town was totally planned. As such, visions of an entire way-of-life were built into the town, including where and how people would live, the kind of family life they would have (for it was a family life that was presumed (Aldridge, 1996)), where they would work, eat, shop and what they would do in the evening and at the weekend (Willmott, 1962; Vincent, 1960). Since our interest is in the relationship between infrastructures-in-use, patterns of practice, and how these change across time, having access to these very clearly defined visions and plans of the original infrastructure and housing provision provides a valuable resource for exploring this. Second, and more pragmatically, because Stevenage was the first post-war new town, and because the majority of the housing was managed by the Development Corporation until the 1970s (when it was transferred to the County Council), detailed archival records have been kept, meaning it is possible to study past infrastructural decisions and the layering of adaptations as time proceeded.

Methodological challenges

Researching how and why rhythms and patterns of daily life change, and the accompanying changes in domestic infrastructure and technology, presents several methodological challenges. Firstly, such a study requires the detailed collection of daily and weekly patterns of life, sometimes from many years ago, with associated concerns about how to encourage accounts of seemingly unmemorable aspects of the past. Secondly, in order that changing patterns of practice might be understood in relation to changing infrastructures-in-use, detailed information about the home at that time – its layout, infrastructural provision and technologies – is required. Thirdly, to understand not just the activities of one individual but of all the activities which

used the infrastructure of the home, it is necessary to collect accounts of daily life about entire households, though often just one member of the household was interviewed. Finally, and related to this, an interest in capturing on/off times of appliances in relation to the daily patterns of household members, meant that an understanding of what was happening at home irrespective of whether or not anyone was there, is of interest too. The research design which combined archival research and retrospective interviews with residents addressed these challenges.

Archival research

Archive work was conducted by my colleague Anna Carlsson-Hyslop and I in 2014. This focussed on the Stevenage Development Corporation materials at Hertfordshire County Council. In the context of this paper two aspects of this work are relevant. First of all, an analysis of planning documents from the mid-1940s to the mid 1970s focussed on the implicit and explicit assumptions of daily life that planners made. Second, a review of files of original drawings of house plans, combined with analyses of meeting minutes, reports and surveys from which further details of the houses have been ascertained, including whether houses were connected to gas and electricity, how the home and hot water were heated, kitchen and bathroom layouts, as well as partial details on the number of electric sockets, and how provision changed across the years (e.g. open fires being upgraded to efficient solid fuel stoves; gas central heating being installed, etc.).

Oral history interviews

To find out about the patterns of daily and weekly life that these different (i.e. original, updated and adapted) homes were part of we collected retrospective accounts of daily and weekly life through interviews with nineteen Stevenage residents. These interviews were conducted between October and December 2014. Participants were recruited to the project via posters and fliers in public buildings, followed by snowballing from initial interviewees. The aim was to recruit participants of a variety of ages to talk about the time when they were between 20–35 years old (see Table 1). These parameters would enable the interviews to capture retrospective accounts of daily life involving a variety of home infrastructures (e.g. solid fuel fire, gas cooker, twintub; storage heaters, electric cooker, automatic washing machine). Detailed discussion was limited to a particular time of life, so that there were some points of comparison and to provide 'memory bookends' within the interview.

A second aim was to home in on two of the neighbourhood areas, namely Bedwell and Pin Green, the first and last of the original neighbourhoods to be built. We knew from our archive work that these homes were built to different standards and with different forms of home heating provision, and that the homes had different adaptations and updates across the period. Our success on these criteria was more mixed, though overall the sample threw up some valuable continuities, with clusters of interviewees from different generations who had lived in the same house type. We knew from the outset that recruiting our ideal set of participants would be challenging, and therefore

Table 1. Interview details.

Interviewee	Years discussed in detail	Neighbourhood (during focal period of interview)
STV1	Late 1970s	Pin Green
STV2	2014	Bedwell
STV3 (couple)	Early 1980s	Pin Green
STV4	Late 1960s onwards	Shephall, Pin Green
STV5	Early 1950s onwards	Old Town
STV6	Late 1960s onwards	St. Martins
STV7	Late 1970s	Broadwater
STV8 (couple, group 1)	Early 1960s	Bedwell
STV9 (couple group 1)	Early 1960s	Bedwell
STV10	Early 1980s onwards	Shephall
STV11	Late 1990s	Old Town
STV12	Late 1990s	Shephall
STV13 (group 2)	2014	Shephall
STV14 (group 2)	2014	Symonds Green
STV15 (couple group 2)	Early 1980s	Symonds Green

designed the interviews such that material would address our concerns whether or not we would be able to directly connect it to the archive work.

Prior to the interviews, a short questionnaire was completed to encourage the process of remembering to begin. The first section of the questionnaire asked about the forms of domestic infrastructure, technology and appliances that participants had experienced across their lifetime (e.g. refrigerator, car, gas central heating etc.), and those they had experienced for the first time. The second part focussed on one specific house where they had lived between the ages of 20 and 35 (house selection was made using criteria that we provided). These questions gathered information on the infrastructure and appliances that were at the home when they moved in, and that they added, adapted or removed while living there. Before the interview, participants drew a plan of that house, indicating (to varying degrees) electric points, heating, hot water, cooking and bathroom appliances.

The interviews focussed on biographical accounts of homes lived in across a life, and the infrastructure and technologies in these homes, followed by a more detailed discussion of the home they had lived in between 20 and 35. They were prompted about particular themes including daily and weekly routines, who was home or out a different times of day, and why; where they travelled to, for what purpose (e.g. school, work, shopping) and how; particular sequences of activity in the morning, memories of keeping warm in the winter and doing the laundry. All the interviews were recorded and transcribed (with the permission of interviewees).

A process of mapping the interviews to the archive data has begun, with the plans drawn by interviewees providing a point of reference with the archive file of original house drawings. Interview transcripts have been imported into NVivo and some broad themes identified and coded – including daily and weekly routines, references to infrastructure-in-use, and references to technology. It is this initial analysis that forms the basis of the remainder of the paper.

Findings

This is an in-progress project, and the pages that follow offer a sample of the findings and the kinds of insights that this qualitative, historical study can offer. The material is organised into three sections to put forward three arguments. First, I present some of the variety of rhythms and patterns of daily life from across the interviewees. The empirical data suggests that in discussing changing rhythms and patterns we should be concerned with different scales of change. For example, some changes were associated with lifecourse such as moving in with a partner/spouse and having children, and some with the introduction of a new appliance or technology to the home (e.g. a car or washing machine). At a different scale, some changes were associated with institutional rhythms and patterns (e.g. a new job at a work place with a particular start time, or children going to school). The implication of such changes intersected with longer term change – for example the effects of having children on daily routine were different at a time when it was common place for women to give up work, compared to contemporary dual career families. These findings suggest that changes in the domestic infrastructure-in-use are related to the place of the home in daily and weekly routines. Methodologically, to understand domestic energy patterns requires studying daily and weekly patterns both at and away from home, and so understanding how the home fits into everyday life.

Second, I present some examples of adaptations and layerings of home infrastructures from across the period. This includes some of the original house plans from the archive, and the accompanying information that we have about provision. Subsequent drawings of home infrastructure are provided in the house plans from interviewees. These drawings explicitly demonstrate the change and increase in opportunities to consume particular kinds of energy across the period of the study. This enables the spread and multi-practising of households when they are at home. Crucially the layers of plans show how spaces are adapted to accommodate new practices – in other words, how ideas about what goes on *at home* varies. I argue that changing infrastructures-in-use are both shaped by and shaping of the increase, dispersal and reconfiguration of opportunities to consume (e.g. of electric sockets, television points, wireless internet).

Third, I focus on the relationship between infrastructures-in-use and patterns of practice. I present accounts of living with a solid fuel fire and gas central heating to argue that this relationship is not direct. To understand changing infrastructures-in-use requires us to think about how technologies, alongside humans are implicated in the performance of practices.

The Rhythm and Pattern of Daily Life

In Tables 2 and 3 I present four interview excerpts about daily and weekly routines (nb interviews have been anonymised and pseudonyms have been used), two talk about the time before marriage and children, and two are the routines of people who were married with children. Three of the accounts are from the 1970s and one from the 1980s. Looking at these interview excerpts alongside one another is useful in highlighting some of the ways in which routines change, and the different scales of change which combine across individuals' lives.

The first aspect to note is change in lifecourse. The excerpts shown represent daily and weekly routines in households without and with children. In these cases, having children has implications for when the home is occupied and empty. Houses where all the household members worked were empty for much of the day. For example in excerpts 3, the interviewee states "when the kids were born … Sandra stopped working in London at that point. She'd be here in the day obviously with the kids", and in excerpts 4 the interviewee comments "I gave up work when I had my first child. So obviously my routine changed a lot" (STV3).

One of the interviewees had a solid fuel fire for heating and this had implications for routines of home heating. When both her and her partner worked the fire was only lit in the evening, once they had children the fire was lit in the morning (or sometimes just stirred-up from the night before) and kept going all day (see excerpts 4, STV7). Another interviewee had always had storage heaters in the home so the change of routine had no effect on heating the home.

For one of the interviewees, life with children had implications for the use of the car, she explains that this is because they had twins and a cumbersome double buggy which it was easier to leave at home:

Table 2. Excerpts about daily/weekly schedules in the 1970s.

Excerpts 1 Retrospective account of daily/weekly schedule 1970s (STV1)	Excerpts 2 Retrospective account of daily/weekly schedule 1970s (STV7)
Daily I would have got up and had a wash, I don't think we even had a shower you know? Initially, just a bath. So I would have got up, got dressed, breakfast … then left, out of the front door and would have walked down to the town, 15 or 20 minutes. You say there was no shower so did you just have hands and face-style wash in the morning or …? Well a sort of campers wash you know, as you do. And a bath when you could, I mean we had a bath, but I wouldn't say every single day I had a bath. You had to turn on the immersion heater and that all cost money. You would wash to make sure you were hygienically clean. My husband got up at the same time, walked to the town centre then got a bus to a neighbouring town. I'd come home every lunch time and walk them … because they were big energetic dogs, and they were only in a small space. In the evening it would have been the same in reverse. Home early evening, cook a meal, maybe go out, maybe not. We didn't have the children then. **Weekly** We'd go and do a weekly food shop, at the weekend, we used to go and bring it all home on the bus – all the numerous carrier bags! Because we were both working all week. We wouldn't just grab stuff on the way home … not having transport made that more difficult, you'd have to walk everywhere you go. And the shops weren't open then like they are now. [Washing with a twintub] With laundry I would say mainly once a week, but that's not to say that if something needed to be washed I wouldn't do it in the week, in the evening. But because it did mean dragging this thing out and faffing around, I'd say once a week at the weekend.	**Daily** My husband was a mechanic at a company in [neighbouring village]. He'd get up at about 5 o'clock, I'd get up at about half past six to start work for about eight o'clock because then I had to get on the bus - I didn't actually start to drive until my second child was born… it was only about a three or four minute walk to the bus stop. My husband had a car and he sometimes had the work van. … we always lit the fire when we got back. We didn't light it in the morning. I must admit we didn't wash as much then, we did wash but it was more of an all over wash … I was working full time then … he would work long long hours because he was on call, sometimes when he got home he'd be called out. Hard going. In the evening, just have dinner, watch TV – that was in the main living room it used to go off quite early – and go to bed, nothing too exciting. I remember only washing my hair once or twice a week. I probably bathed around 2 or 3 times a week, that was pretty standard … usually in the evening. **Weekly** We mainly used the local shops then and we didn't shop once a day like people do now, we'd only shop once or twice a week to stock up a bit. I didn't have time to stop at the shop but they didn't have the big supermarkets then. We would do more or less weekend shopping. [Washing with a twintub] … you didn't just press a switch you had to bring it in from wherever it was stored, attach it to the tap, attach the overflow thing, and yeah so we did – more or less – have a set day for the washing. When we both worked, obviously it would be done in the weekends.

Table 3. Excerpts about daily/weekly schedules in the mid-late 1980s.

Excerpts 3 Retrospective account of daily and weekly schedule in the mid-late 1980s (STV3 couple interview about after marriage & then children) **Daily** We both worked in London until the kids were born. When we got married, we started going up to London by the coach – Green Line – from the town here… at least a half cheaper if not more than the train and it was just more relaxing and less stressful to go on the coach … Yes, we always had storage heaters, so there would always be some heat in the morning. We did that on the coach together from 1987 until 1990 when the kids were born. Sandra stopped working in London at that point. She'd be here in the day obviously with the kids but I would still get up at that time and go off. Sandra taught the kids at home until they were 8, mainly in the lounge. We didn't really use the kitchen an awful lot, I know people say it's the heart of the home but we didn't really go in there a lot. We didn't really want to move [house], so we tried to make it as big as possible for our purposes. So that's why we did the bits and pieces. I always used to go for walks with the kids to the woods and stuff but if it was far woods I would drive there and then they'd walk … I would use the car for everything … It was convenience, because we had twins you know, Richard's mum and dad bought us this beautiful pram, a double buggy … but you couldn't put it anywhere, you couldn't get it in the doors, you couldn't get it in the boot, so I used to not use it and used to carry the kids **Weekly** [We did laundry] 3 or 4 times per week. It was quite a big machine so we could fit a lot and it did have a dryer on it which we hardly ever used because we'd put them in here in the winter, and blow it out there in the summer. I don't like wasting electricity I used to get shopping in the town centre on the way home from work. When Sainsburys moved out of the town centre to Poplars (out of town supermarket) we did it by car.	Excerpts 4 Retrospective account of daily/weekly routine 1970s (STV7 after having children) **Daily** I gave up work when I had my first child. So obviously my routine changed a lot. I had my mother just around the corner so I would spend a lot of time round there. Probably as much time as I was in my own home. [When at home] we'd have the open fire in the living room, we had the fire guard obviously, this big square fire guard. Sometimes it would stay in all night and we'd just have to stoke it up, but not very often, it would burn out during the night. [When at home we spent time] mainly in the lounge, but we did go into the dining room to eat. We always used to lay the table and eat in the dining room. Literally you'd only go upstairs to sleep in the winter because there was no heating up there … it just wasn't very pleasant. Once we had the central heating I'd spend more time up in my room, the boys would definitely spend more time up in their bedrooms. They had a playroom up there that they shared, and they'd spend much more time up there. **Weekly** … after I had the children, I'd go down and laden up the pram. They had the shopping trays at the bottom of the pram. Laden the pram up with shopping down at the local shops. Monday was mainly the washday. Obviously you wanted to boil the nappies, with the twin tubs you didn't do a massively hot wash, so we used to boil the nappies on top of the cooker in an enamel bucket. That would be several times a week. It would depend on how many nappies you could afford at the time

> I would use the car for everything … It was convenience, because we had twins you know, Richard's mum and dad bought us this beautiful pram, a double buggy … but you couldn't put it anywhere, you couldn't get it in the doors, you couldn't get it in the boot, so I used to not use it and used to carry the kids. (STV3)

The initial analysis suggests that lifecourse changes had various implications for routines, and that the implications of these new routines for infrastructures-in-use depended on the kinds of technology that these new patterns intersected with.

The second aspect to note is that routines change in relation to the introduction of new technologies into the home. Within our data, this phenomena can be analysed by comparing how practices like doing the laundry and keeping warm in winter fit into the daily and weekly routines of those living with different technologies, as well as considering the accounts of those who experienced change within their own life. Excerpts 1 and 2, talk about fitting the laundry into the weekly routine when living with a twintub washing machine. The full interview transcripts provide more detail on this process (STV1, STV4, STV5, STV7, STV8, STV15).

Twintubs were free-standing appliances generally stored in the corner of a kitchen or store room, and 'wheeled-out' into the kitchen next to the sink for use. They had hose pipes to attach to the tap, and to place into a bucket for the waste water. Around an hour before doing the washing the immersion heater needed to be turned on, as this was how the majority of Stevenage homes got their hot water at that time (1970s). The next step was to set up the machine, fill it up with hot water and add soap suds. The clothes were then mechanically washed in the left side of the machine. Many of the interviewees did all the washing in one day when they had this kind of technology. This was because they used the same hot water to do everything (starting with the least dirty items), because the volume of the machine was small (so they had to do multiple loads), and because of the fuss and hassle of getting it out/setting it up – not a task that they wanted to do more than once a week, plus the overall duration of doing the laundry meant it was difficult to fit in with a full time job. Interviewees described unloading the machine using 'giant wooden tweezers' (because the water was hot) and loading it up again – several times over. When all the loads were finished the water would be drained into a bucket. The machine would then be refilled with water for rinsing. The clothes would be transferred to the right side of the machine for spinning (once again in multiple loads). Finally the laundry would be hung out in the garden or around the house for drying.

Twin tubs removed much of the labour that wash day had previously entailed, however, it was still a big job requiring hands on work at many points in the process. Because of the sequenced stages and interventions that the job demanded (as well as the duration of the overall task) laundry was generally done on a specific day. For my interviewees who worked full time, this meant doing the washing at the weekend. This is noted in excerpt 1:

> … you didn't just press a switch you had to bring it in from wherever it was stored, attach it to the tap, attach the overflow thing, and yeah so we did – more or less – have a set day for the washing … When we both worked, obviously it would be done in the weekends. (STV1)

With an automatic washing machine in the home, these patterns were very different:

> It was really good when we got an automatic machine … now if we have enough for a load of washing I will put a load on, or [husband] will put a load on if he's here. (STV1)

In this example, the intrinsic sequence and duration of doing laundry has implications for when it is done. The requirement for intervention at multiple points in the process also means that a household member has to be present. As a result for those who worked full time, the laundry had to be done at the weekend. As the technologies for doing laundry changed, so did its intrinsic rhythm. The important point though, is that such a change in laundry has implications for the configuration of the entire week, and thus for the patterns of energy-demanding practices of which the week is made. The implications of such observations for understanding and managing patterns of energy demand will be further considered in the next part of the project.

There are two other points to be taken forward in our future analysis, the first is about how institutional schedules (especially of workplaces, shops and schools) has an effect on daily and weekly routines. The second is to note that life course changes (noted above) have different effects depending on the generation of interviewee, both in terms of the infrastructures and technologies that this change intersects with, and also because of changes in women's work, which had implications for the permanent or temporary character of these changes.

Changing infrastructure: spread, adaptation and multi-practicing

In this section I present some examples of home infrastructures from across the period. This includes some of the original house plans from the archive, and the accompanying information that we have about provision. Subsequent home infrastructures are provided in the house plans that interviewees drew for me. These drawings explicitly demonstrate the change and increase in opportunities to consume particular kinds of energy across the period of the study. This enables the spread and multi-practising of households when they are at home. Crucially the plans show how spaces are adapted to accommodate new practices – in other words, how ideas about what goes on *at home* varies. I argue that changing *infrastructures-in-use* are both shaped by and shaping of the increase, dispersal and reconfiguration of opportunities to consume (e.g. of electric sockets, television points, wireless internet).

Figure 1[1] shows a drawing of house type B24 (North facing) from our archival research. The B24 was one of a range of house designs for the neighbourhood of Pin Green – this was the last of the planned neighbourhoods built in the early 1960s. This neighbourhood was built to Radburn layout, meaning the front of the house opened out onto a pedestrian street or landscaped square and road access was at the back of the house. The B24 was a 2 bedroom home, listed as a '4 person home' in the rent book) with two downstairs rooms. Only the downstairs was heated, with a solid fuel fire, a back boiler (for hot water), and an immersion heater for hot water in the summer and for

1. Original house plan in ACC 3715 House plans case studies.

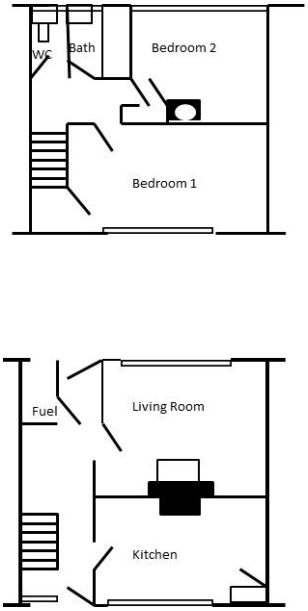

Figure 1. Redrawn from the original plan of the B24.

topping up the heat from the open fire. There was a radiator in the kitchen which ran off the back boiler. Kitchens had a stainless steel sink, gas/electric point for the cooker (fuel type was the tenants choice), a larder cupboard with airbrick in the corner. The larder cupboards of these houses were the size of a kitchen cupboard, in contrast to earlier homes where they were separate rooms, or large floor to ceiling stone built cupboards. The B24 homes were built at a time when refrigerators were beginning to become more common, which is perhaps one reason for this (as tenants in earlier homes had been requesting larder removals from the late 1950s). The front door opened onto a hallway/store which ran front-back, with a door into the backyard. The area between the backdoor and the brick built store was covered. The fuel store formed part of the hallway and could be accessed from inside and outside. Upstairs was an airing cupboard (above the back boiler), but there were no radiators or heaters. There were electric sockets (although we do not know how many). The bathroom had bath, sink and toilet, but no shower. Windows were single glazed. The rent included a television aerial and fibre glass roof insulation[2].

Figure 2 shows the same house type in the mid 1970s when one of my interviewees (STV1) first moved into the property. By that time the radiator in the kitchen had been removed, the solid fuel fire was replaced with a gas fire. Hot water was from a boiler with immersion heater and there was a storage heater in the hall. Though the larder cupboard was still in the kitchen the interviewee had a refrigerator as well. The solid fuel store had been removed from the hallway. The interviewee could not remember exactly where the electric sockets were, but deduced that there must have been at least one electric point in the lounge (for the television), and in the kitchen (because she had a kettle and toaster). She can't remember whether or not there were sockets in the upstairs, and thinks there were perhaps none in bedroom 2.

By 1983 (Figure 3 – I have drawn this from the house details when the interviewee moved out) the same home has full gas central heating and insulated ceilings in most of the rooms. All the windows are UPVC double glazed. The kitchen has fridge and freezer, and an automatic washing machine. There is a wall mounted telephone in the hallway. There is a lagged hot water cylinder with an immersion heater in the airing cupboard (in bedroom 2). The bathroom is all one room with toilet, sink, bath and shower. The home details also note 'ample power points throughout'.

Figure 4 shows another B24 house of a different interviewee (STV3). When he moved in, the home had a gas fire in the lounge, and he added storage heaters to the lounge and kitchen. The old radiator (from the back boiler) was still in the kitchen but wasn't used. He had a gas cooker and automatic washing machine when he moved in. In the bathroom there was a bath (but no shower), sink and toilet. Hot water came from an immersion heater. By 1996 (Figure 5) the interviewee lived with his wife and twins (son and daughter). The wall between the lounge and hall had been knocked through, and the brick built store incorporated to make a large L-shaped room. In the upstairs bedroom 1 was turned into 2 small bedrooms. New storage heaters had been bought for the whole house with the exception of one of the children's bedrooms (where they used a portable electric heater). A fridge freezer and dishwasher were added to the kitchen. The number of electric points in the downstairs had been increased, and at least one electric point had been wired into each of the upstairs rooms. A shower had been added in the bathroom.

Placing these modified and adapted homes of different decades alongside one another brings several important observations into clear view. First of all, the opportunities to consume energy, and so the potential overall demand and possible peak demands of any individual home increase. For example, contrast the heating of two rooms from a solid fuel fire in the original design to the whole house central heating of Figure 3. Likewise compare the small number of electricity sockets remembered by the interviewee in Figure 2 (1976) to the potential interfaces with electricity in Figure 5 (1992). The second observation, related to but distinct from the first, is the extent to which energy consuming technologies are part of the infrastructure of the home. The original drawing of Figure 1 provides for downstairs heating, hot water, fuel storage, and a connection point for a cooker. Additional services come from portable technologies, for example, paraffin heaters in the hallway, free standing electric heaters, hot water bottles and electric blankets to keep warm in the non-heated rooms of the home; twintub washing machines that are wheeled out for use, and showers that attach to the bath taps. By 1981 many of these previously portable devices have become part of the infrastructure: the home comes with full gas central heating, plumbing for a washing machine and a shower.

Finally, the spread of opportunities to consume and of services like heat throughout the home are intrinsically linked to what the spaces of the home are used for, and the possibilities for households to 'multi-practice' in multiple spaces i.e. do different things to one another, in different parts of the house, when they are at home together. This is noted in excerpts 4

2. Information taken from Contract 594 – Pin Green East Housing – Fairlands CNT_ST_5_2_18 Departmental, C.E.O.

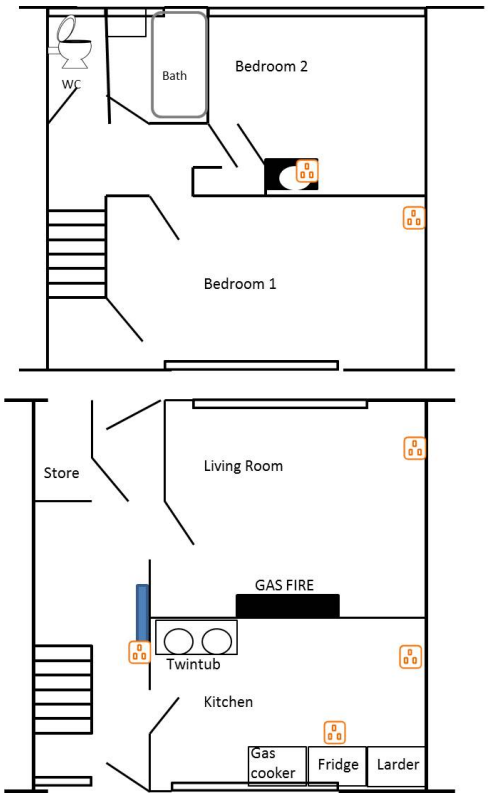

Figure 2. B24 in 1976.

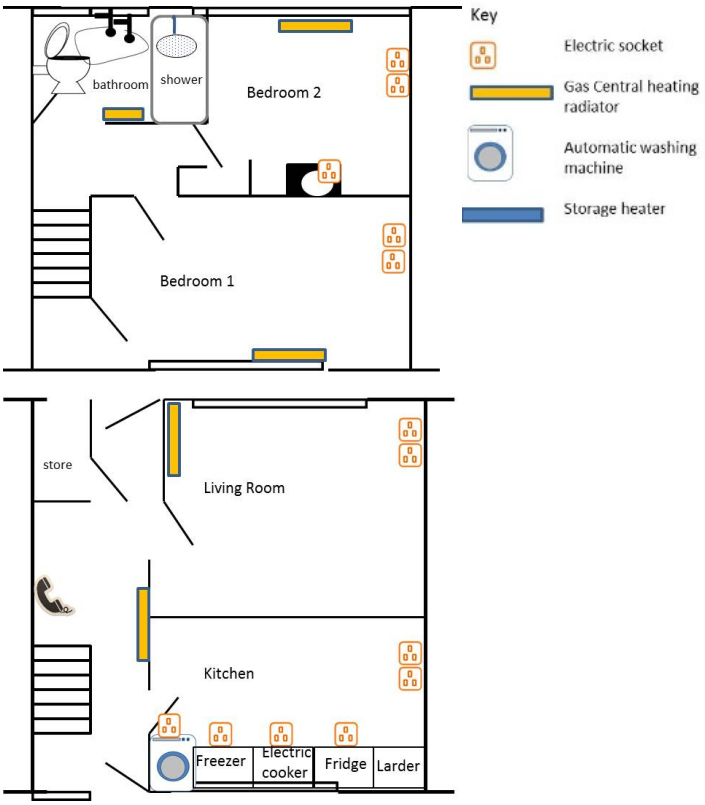

Figure 3. B24 in 1983.

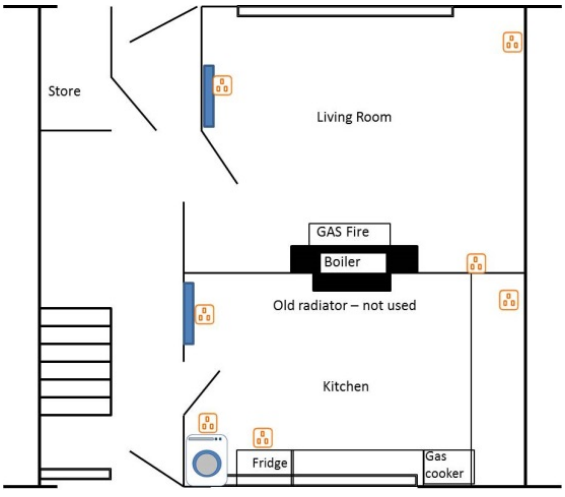

Figure 4. B24 in 1981.

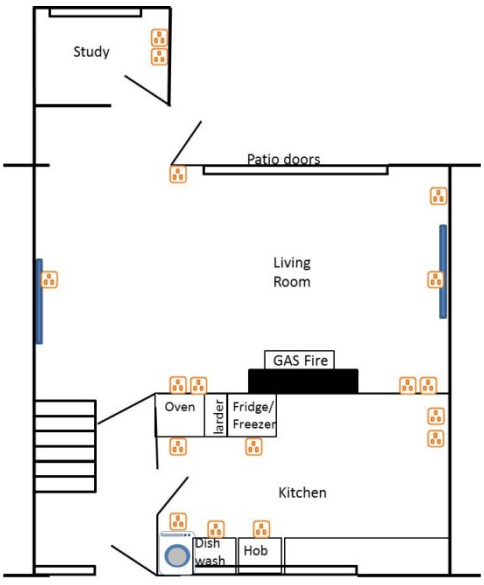

Figure 5. B24 in 1992.

where the interviewee talks about a change in how the spaces of the home were used after central heating was installed:

> … you'd literally only go upstairs to sleep in the winter because there was no heating up there, it just wasn't very pleasant. Once we had the central heating I'd spend more time up in my room, the boys would definitely spend more time up in their bedrooms. They had a playroom up there that they shared, and they'd spend much more time up there. (STV 7)

The infrastructure changes the space, the spaces then become part of new or re-located practices which might then require further infrastructural modifications, in a mutually configuring relationship.

The point about spaces being adapted to new practices is really brought home in Figure 5. Here the entire house (upstairs and down) was reconfigured as household membership changed from a single man to man plus wife plus twins. This meant creating 3 bedrooms upstairs, and creating a large shared

room downstairs, which was partly done to provide a room where the children could be home-schooled:

> Sandra taught the kids at home until they were 8, mainly in the lounge. We didn't really use the kitchen an awful lot, I know people say it's the heart of the home but we didn't really go in there a lot. We didn't really want to move [house], so we tried to make it as big as possible for our purposes. So that's why we did the bits and pieces. (STV3)

To summarise, the changing daily and weekly routines outlined in the first section do not happen in isolation, but rather are both shaped by and shaping of the infrastructure and technology of the home. The drawings indicate that opportunities to consume particular kinds of energy across the period of the study both increase (and decrease in the case of solid fuel) and spread throughout the home, enabling spatial distribution and multi-practicing of households when they are at home. However, this relationship is not one way. As Figures 4 and 5 illustrate spaces are adapted to accommodate new practices – what goes on *at home* varies and changes, and this shapes the increases, dispersals and reconfigurations observed.

Infrastructures-in-use and Patterns of Practice

In the preceding sections I have touched on routines of daily and weekly life, and on how home infrastructure changed across the period of the study. In the final section I comment on how these two sets of observations relate to changing patterns of energy demand. What is the relationship between the patterns of practice of my interviewees, the home infrastructures and technologies they have lived with, and infrastructures-in-use? I will argue that to understand this relationship we need to focus further on how technologies are implicated in performances of practices. By way of example I contrast living with a solid fuel stove and with central heating, and the implications for daily routines.

Living with a solid fuel stove and backboiler had several implications for patterns of everyday practice and how the home infrastructure was used as part of this. For example, in the excerpts above, the interviewees outline morning routines which involved a 'campers-style' wash, and taking baths in the evening 2 or 3 times a week. This was partly to do with the inconvenience of having a bath in the morning, partly because of costs of heating hot water, and also because of the lack of heating in the upstairs:

> I can remember the bathroom being absolutely freezing. You know that thing where you lift a damp flannel and it's solid. I can remember that. (STV1)

These interviewees spoke of a cold house in the morning as normal 'you just got on with it', this is because it would have made little sense to spend time lighting the fire when all the household members would be out all day: "We didn't bother lighting the fire in the morning, I'd always light that when I got home …". In the evening it would be common to heat just one room, meaning that in the winter at least, it was more likely that all of the household would spend time in the same space:

> The back room – you'd sort of keep the doors shut to avoid losing the heat – or to stop the cold spreading. Keeping in the heat you wanted. (STV1)
>
> you just kept moving … obviously you wore a lot warmer clothes inside. Plenty of jumpers, doubling up. I remember using hot water bottles and electric blankets … I remember with the boys they wouldn't go to bed until the hot water bottle had been in there for a while. (STV7)

Living with gas central heating (for radiators and hot water) combined with daily routines in different ways. A younger interviewee (STV2) explained their daily routine in the 2000s. In this routine having showers in the morning is a regular occurrence:

> Mary will get up and go in to the bathroom. So she might be turning on the shower.
>
> I alternate, so one day shower and the next day shave. Fortunately I don't have to shave everyday so that's what I do at that point, so I'll be in the bathroom either using the shower or running hot water, and the boiler, we use a combination boiler so we don't have to worry about the water.

So having a shower seems to be connected to having hot water 'on demand' which makes it possible to shower whenever you want, it is no longer dependent on having the fire lit, or on pre-empting the wash by turning on the immersion heater. In addition and in contrast to the quotes above, the whole house, including the bathroom is already warm when the family rises:

> … the heating is on a timer so the heating will have come on at about a quarter to seven. So the house will have been warming up.

So warming the home, like warming the water no longer requires the intervention of a household member. This applies to other things too, for example this family has fresh bread throughout the week:

> we've got a bread maker, so in fact the bread maker would be set the previous evening so there would be a loaf baking before we get up. it takes several hours so it would be churning away at three o'clock in the morning or whatever.

Further, the multi-practicing (noted in the previous section) is apparent even as part of the morning routine – infrastructure is in use throughout the house from the moment of getting up, possibly because it is warm enough to be in any room of the home:

> while Mary's in the bathroom I'll probably be, well I'll be getting up and probably coming down stairs to the kitchen and put the kettle on, and often the children are already up. So they might be down here. Layla might be watching TV or they might be, they've both got kindle tablets and they both like watching – particularly Dylan likes watching videos about Lego.

Contrasting these excerpts of living with a solid fuel fire with backboiler and immersion heater, and gas central heating and a combination boiler highlights that the *relationship* between infrastructure-in-use (i.e. when energy is drawn through the infrastructure of the home), and everyday rhythms and patterns of household members has changed across time. In these examples the complicating of the relationship seems to stem from the different technologies which mediate between the infrastructure and practical tasks (taking a shower in the morn-

ing becomes a possible, convenient and comfortable thing to do), and keeping warm changes status from being a practical achievement (involving keeping moving, layering up, managing heat-flows, and in the evening lighting a fire) to a service that is provided to all the rooms of the home – making multi-practicing possible – and thus activating more infrastructure-into-use from the beginning of the day.

Concluding Remarks

The paper argues that understanding what energy is for requires understanding the relationship between patterns of practice and infrastructure-in-use. Our research has recognised and embraced the complexity of this relationship, acknowledging that patterns of practice change across time, that infrastructures also change across time, and that the character of the relationship between practices and infrastructures changes too (e.g. doing the laundry involves different kinds of connection with the infrastructure than it used to). Current patterns of infrastructures-in-use are the result of all these aspects. By focussing on homes and domestic life in Stevenage between 1950 and 2000, and combining archival research with retrospective accounts of residents of different ages I have made three arguments drawing on our empirical data. First of all, I argue that the place of home in daily and weekly routines has implications for domestic infrastructures-in-use, therefore to understand domestic energy use we need to understand how the home is part of the flow of life both at and away from home. Secondly, I argue that patterns of infrastructures-in-use are reliant on an increase and dispersal of opportunities to consume (e.g. of electric sockets, television points, wireless internet) which result in the spreading out and multi-practicing of households when they are at home (which is part of a mutually configuring relationship). Thirdly, I argue that the relationship between infrastructures-in-use and patterns of activities of household members is not direct, rather to understand changing patterns of infrastructures-in-use requires us to think about how technologies are implicated in the performance of practices, and how that has changed across time.

In the next part of our project we will shift our focus to explore the assumptions of practice patterns and infrastructures-in-use that planners of towns and homes use. Through doing so we aim to connect our analysis to methods and processes of envisioning future demand.

References

Aldridge M. (1996) Only demi-paradise? Women in garden cities and new towns. *Planning Perspectives* 11: 23–29.

Lefebvre H. (2004) *Rhythmanalysos: space, time and everyday life,* London: Continuum.

Shove E and Walker G. (2014) What is Energy For? Social Practice and Energy Demand. *Theory, Culture and Society* 31: 41–58.

Southerton D, Diaz-Mendez C and Warde A. (2012) Behavioural change and the temporal ordering of eating practices: A UK–Spain comparison. *International Journal of Sociology of Agriculture and Food* 19: 19–36.

Vincent LG. (1960) The Town Centre. *The Town Planning Review* 31: 103–106.

Walker G. (2014) The dynamics of energy demand: Change, rhythm and synchronicity. *Energy Research and Social Science*: 49–55.

Willmott P. (1962) Housing Density and Town Design in a New Town: A Pilot Study at Stevenage. *The Town Planning Review* 33: 115–127.

Zerubavel E. (1985) *Hidden Rhythms: Schedules and Calendars in Social Life,* London: University of California Press Ltd.

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