

DeMand

DYNAMICS OF ENERGY, MOBILITY AND DEMAND

IF THE WALLS COULD TALK
DAILY RHYTHMS AND
ENERGY USE IN STEVENAGE

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The 13th annual Festival of Social Science takes place from 7-14 November 2015 with over 200 free events nationwide. Run by the Economic and Social Research Council, the Festival provides an opportunity for anyone to meet with some of the country's leading social scientists and discover, discuss and debate the role that research plays in everyday life. With a whole range of creative and engaging events there's something for everyone including businesses, charities, schools and government agencies. A full programme is available at www.esrc.ac.uk/festival. You can also join the discussion on Twitter using #esrcfestival.

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IF THE WALLS COULD TALK

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This booklet gives a taste of the questions, images and ideas explored in Adapting Infrastructures for a Lower Carbon Society, a research project within the DEMAND Centre (Dynamics of Energy, Mobility and Demand) at Lancaster University, funded by the Research Councils UK Energy programme. The aim of the project was to understand how household energy demand has changed since the 1950s. We focused on different aspects: How have systems of home heating changed since 1950? How has this affected the way homes are used and lived in? How and why have daily and weekly routines changed over time? Are some routines and habits more important for energy use than others? How have designers, architects and planners influenced homes and daily life, and how can past experiences of planning inform adaptation in the future?

We investigated these questions by using archives and oral histories as a means of studying change from 1950 – 2000 in Stevenage New Town and Stocksbridge. This booklet presents findings from the Stevenage research.

DAILY RHYTHMS AND PATTERNS OF ENERGY USE

In the UK there are daily, weekly and annual peaks in electricity demand.

Peak energy demand is an important issue for policy makers and energy providers. Energy demand could be met more efficiently, and with less CO₂ emissions if the profile of consumption was less peaky.

Greater reliance on renewable energy, which is good for reducing CO₂ emissions, makes it harder to match the timing of supply with the timing of demand. For example, solar energy is dependent on sunlight, and limited to daylight hours, but peak demand happens in the winter, in the evening when there is no sunlight available. This is a problem because electricity is difficult to store.

At the moment there is an assumption in the electricity sector that peak demand will continue to increase, and that peaks will occur at the same time of the day and week. This assumption affects how future supply is planned and developed. However, as our research shows, peoples' daily and weekly routines are not static: they change over time, and do so on a societal scale.

This observation is both challenging and a reason for optimism. It is challenging in that it makes modelling future peak demand complicated and uncertain. It is optimistic because it suggests that current patterns of peak demand are not inevitable, and therefore rather than developing energy systems capable of providing for even bigger future peaks, policy might instead focus on reducing them.

To discover how peaks in demand have changed we researched the following questions:

Why are peaks when they are?

What changes in daily life since 1950 have contributed to these peaks?

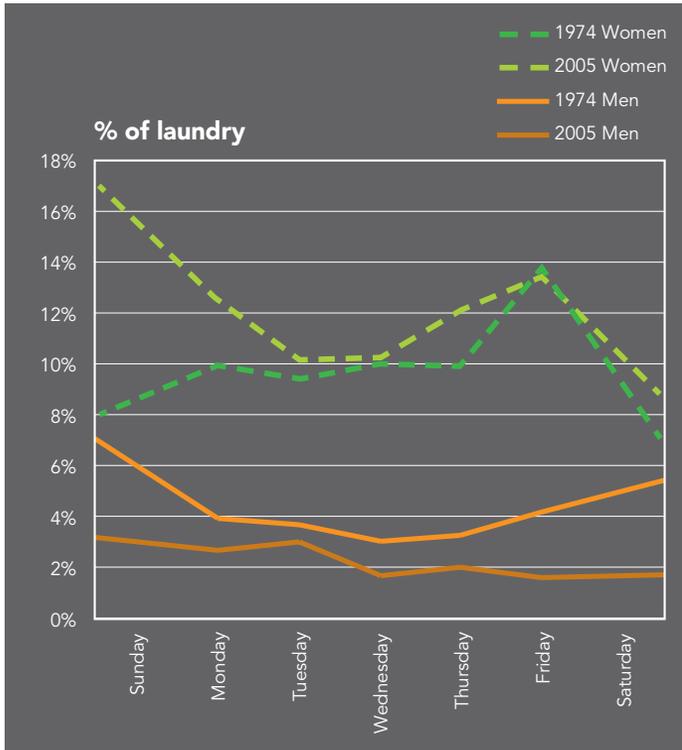
What are people actually doing at times of peak electricity demand?

How might peak demand be changed?

Here's what we found in Stevenage...

Energy is not used for its own sake, but to enable a range of social practices, like keeping warm, doing the laundry and relaxing at home.



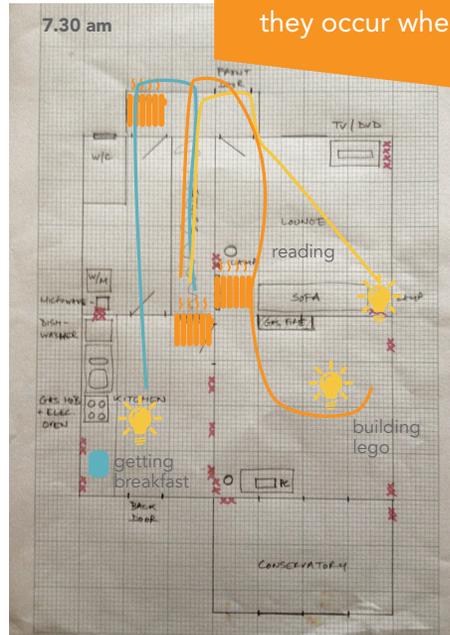
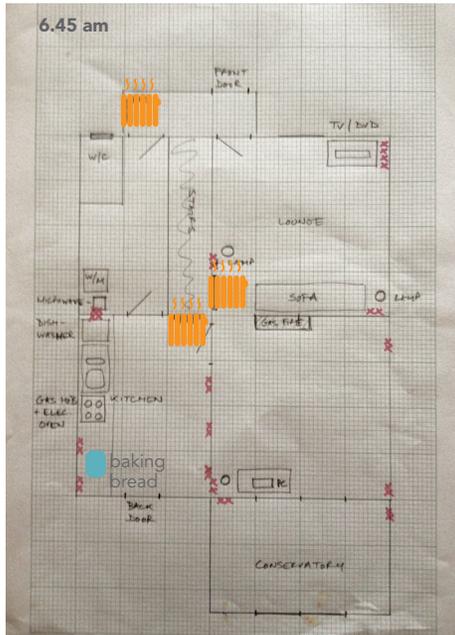


Peak demand is an outcome of what people do on a daily basis and of when they do it.

Figure Who does the laundry and when? (values=% of all laundry reported by gender, day and year), based on national time use surveys.

Figure from DEMAND Research insight No. 2

Figure Energy use of a family of four at 6.45am and 7.30am. Stevenage house type C5.



Studying past and present daily routines in Stevenage can help us understand how peaks in demand are made, and why they occur when they do.

- Key**
-  light
 -  radiator
 -  bread maker
 -  household members

Domestic technologies have changed daily and weekly routines, and the timing and frequency of energy demand.

The IDEAL domestic boiler. These boilers were the original source of hot water in Monks North, 1956. Eventually they were replaced by immersion heaters, and more recently (in some homes) by combi boilers.



Changes in hot water supply made more frequent routines of showering and bathing possible.

“...in the morning we would just do top and tail... we’d bath once a week on a Sunday night, so you were ready, nice and clean, for Monday. (1960s)

“...we would have a camper’s wash – as you do. I mean we had a bath, but I wouldn’t say every single day I had a bath... You would wash to make sure you were hygienically clean but I don’t remember having a bath everyday. (1970s)

“Mary will get up, go in to the bathroom and turn on the shower... I alternate, so one day shower and the next day shave... we use a combination boiler so we don’t have to worry about the water. (2000s)

Replacing a twin tub with an automatic washing machine didn't just make laundry easier. It changed the weekly schedule.



Rolls 'Duo-matic' twin-tub, Science Museum/Science & Society Picture Library

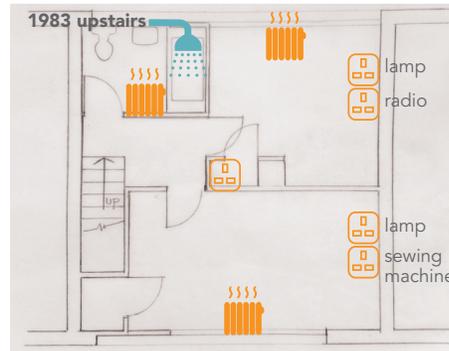
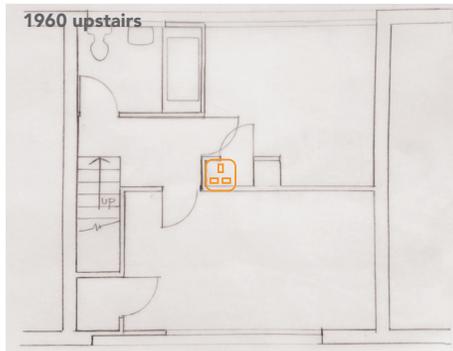
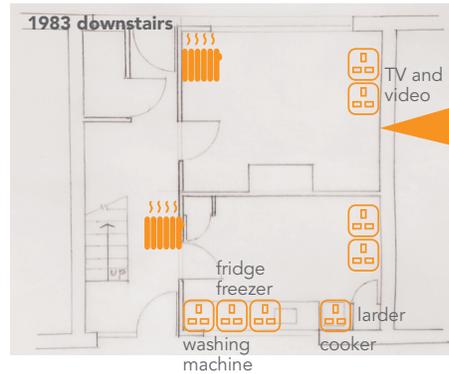
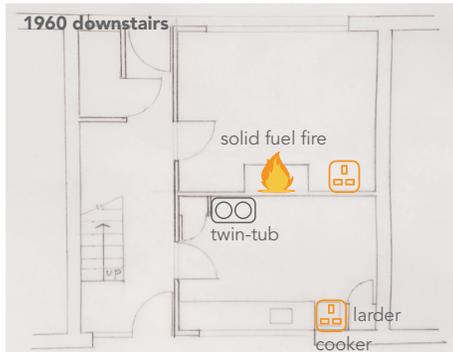


The spread of central heating resulted in a spread of activities around the home.

“ Literally you’d only go upstairs to sleep in the winter because there was no heating up there... it just wasn’t very pleasant.

“ we’d have the open fire in the living room, we had the fire guard obviously... when we were at home we spent time mainly in the lounge.

“ 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 bedroom. It was like a playroom up there, and they’d spend much more time up there.

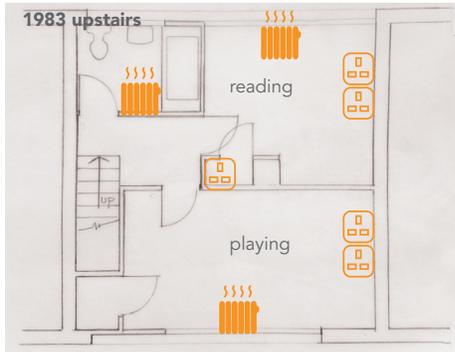
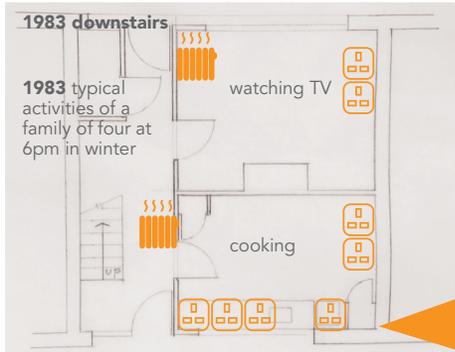
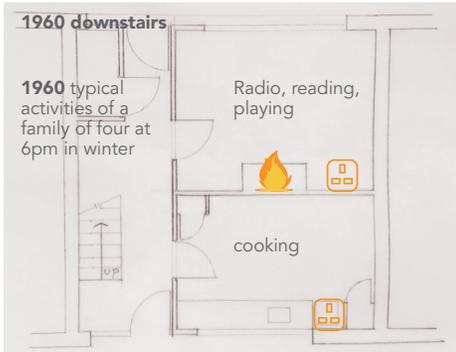


Rooms have been 'wired up' for these new uses.

Figure House type B24 redrawn from The Housing Factfile, Hertfordshire Archives and Local Studies

Key

-  solid fuel fire
-  radiator (gas central heating)
-  twin-tub washing machine
-  electric socket
-  shower



More people and appliances can consume energy at once. The potential 'peak' increases.

Figure House type B24 redrawn from The Housing Factfile, Hertfordshire Archives and Local Studies

- Key**
-  solid fuel fire
 -  radiator (gas central heating)
 -  electric socket

Appliances are sized for 'peak' demand. Ovens are sized to cook a family Christmas dinner, they are not designed and optimised for regular use.



Appliances become part of the infrastructure, reproducing and standardising certain forms of consumption, and certain scales of capacity and provision.

1950s kitchen

Appliances are free-standing and available in a range of sizes



Contemporary kitchen

Appliances are fitted and sizes are standardised

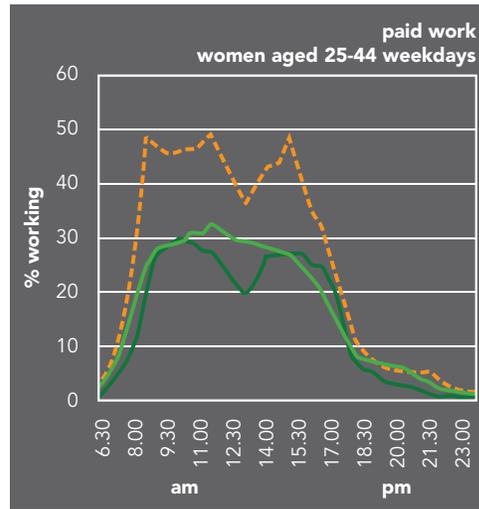


But now... more people live alone and ovens are used to cook different types of food, such as pizza. So maybe kitchen appliances should change too.



The increase in women's work from 1950-2000 helps explain the concentration of activities in the evening peak.

Figure Paid work through the day for men and women, UK national time diary studies 1961-2001



These graphs are from a report by Gershuny, J. (2011) Time-Use Surveys and the Measurement of National Well-Being, Centre for Time Use Research, University of Oxford and ONS.

Institutional timetables – of schools, shops and workplaces – have an effect on daily and weekly routines and patterns of domestic energy use.

“...we always used to do a big shop on a Saturday. We were both working all week... the shops had half day closing on Wednesdays, there was no Sunday opening and they opened and shut at rigid times, no late night shopping. (1970s)

“...when they were at school we would have been up about 7 o'clock. The heating was on this very old analogue timer and that would have come on about half an hour before we'd get up and then it would go off around 9 o'clock. There was no point having it warm when the kids weren't there. (1980s)

“When we were first married we used to work long hours. Then get home, get dinner and watch TV, but it used to go off quite early, it was only on until 10. The screen would just sort of disappear and you'd have this little dot in the middle. (1960s)

Employment policies and business practices matter for daily and weekly routines and for patterns of household energy demand.



This booklet gives a taste of the ideas emerging from our work in Stevenage in relation to the issue of peak electricity demand. Our work provides evidence of how daily and weekly routines have changed since 1950. It shows that new domestic technologies, changing patterns of work, and the timetables of shops, schools and workplaces all play a part in shaping daily and weekly routines. Rather than viewing routines and associated peaks in demand as inevitable, policy might instead focus on re-shaping daily rhythms and reducing peaks.

Thank you to Stevenage Museum, to Hertfordshire Archives and Local Studies, and to all the Stevenage residents who took part in the research.

If you are interested in finding out more about these and other ideas, visit our website www.demand.ac.uk



DEMAND is one of six Centres funded by the Research Councils UK to address 'End Use Energy Demand Reduction'. DEMAND also has funding from ECLEER (EDF R&D), Transport for London and the International Energy Agency.

www.demand.ac.uk