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Oral histories of domestic heating transitions in England and Sweden: lessons on how heating transitions play out across place and time

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ABSTRACT

Over the last seventy years, most European countries have undergone one or more transitions in home heating provision. Moving first away from burning solid fuels and towards communal or individual central heating systems and now towards low carbon electric heating systems. Heating transitions are awash with personal, social and cultural complexity but tend to be simplified into grand narratives that tell simple stories of technological triumph. Through analysis of 21 oral histories gathered across England and Sweden, we look beyond the techno-economic dimensions of heating transitions to understand how they play out in diverse ways in everyday life over time, producing different experiences and outcomes (socially, culturally, financially) across places and social groups. We reveal similarities and divergences between the outcomes associated with different heating transition routes pursued in each country, underlining the long-lasting consequences of heating change. The research reported in this article received full ethics approval from the University Research Ethics Committees at Sheffield Hallam University and Lund University. Informed, written consent was obtained from all research participants.

KEYWORDS: Heating; home; transition; oral history; place

Introduction

Over seventy years, most European countries have undergone one or more transitions in home heating provision, moving first away from burning solid fuels (i.e., coal/wood) in the home and towards communal or individual systems (e.g., district/gas central heating) and now aspiring to move towards low carbon electric heating systems (Ambrose et al., 2023). The move towards low carbon heating is vital, with the heating sector accounting for up to 38% of EU carbon emissions (European Public Policy

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Committee (IEEE, 2018). But heating transitions are also awash with personal, social, cultural and financial complexity. Care must therefore be taken to look beyond the techno-economic dimensions of heating transitions to understand the full range of impacts and how these impacts play out differently across places, social groups, and even between different individuals within the same household.

The scope for domestic heating transitions to impact unevenly and to deepen existing or create new injustices between different groups within society and within and between regions and countries, is demonstrated by the legacy of past heating transitions (Bouzarovski & Tirado Herrero, 2017). A failure to consider the justice implications of changes to domestic energy provision and how new systems might serve some groups and places better than others, has contributed to a failure to provide universal access to affordable warmth across Europe, with certain groups and places now more exposed to energy poverty than others (Bouzarovski & Tirado Herrero, 2017). Studies have also shown how heating transitions have (often inadvertently) disrupted valued cultural activities allied to home-making (Karlsson et al., 2020) and have contributed to the loss of livelihoods and the obsolescence of some settlements (Rohse et al., 2020).

The roots and impacts of these inequalities and negative consequences are poorly understood with the detail lost within 'grand narratives' about how conditions are always improving (Darby, 2017). Such narratives tell a simple, linear story about how history has unfolded, perhaps because narratives that capture a diversity of outcomes feel too messy and complex. Examples of grand narratives in this context include the contention that the shift to gas central heating in the UK universally delivered increased comfort and cleanliness (Johnson-Schlee, 2024), overlooking a more mixed picture in reality (Ambrose et al., 2023). The reality of domestic energy transitions is far more diverse and complex than grand narratives suggest and here we argue that the application of historical methods, in this case oral histories, to the study of domestic energy transitions, exposes complex lived realities of transition, enabling us to challenge or flesh out grand narratives using diverse experiences.

Demonstrating the value of studying diverse lived realities of heating change across time and place and the specific benefits of oral history for drawing out detail and nuance, this paper presents findings from 21 oral history interviews undertaken in England and Sweden between 2016 and 2019. The interviews focussed on respondents' memories of keeping warm at home over their lifetimes. We explore these accounts with the objective of understanding how past eras of home heating impacted on households, their comfort and energy affordability and interacted with the rhythms and routines of domestic life and the enactment of culture. We reflect on how these experiences might shape how the current transition to low carbon heat sources plays out. There is a degree of comparison between experiences across the two countries, revealing how different approaches

to home heating provision can yield very different experiences, outcomes and legacies for households.

This paper is situated at the confluence of a number of bodies of literature, including: the literature around the social and cultural implications of domestic heating and changes to it (i.e., Darby, 2017; Hine et al., 2007) which advocates moving beyond a heavily techno-economic approach to making domestic energy policy making (i.e., Devine-Wright et al., 2014); that relating to the personal and emotional nature of energy transition and its interaction with notions of home (i.e., Goodchild et al., 2017; Rohse et al., 2020; Waitt & Harada, 2019); and that concerned with the potential of historical methods to reveal the complexity of transitions and to generate learning for the present and future (Mahon, 1992, Veyne, 1997). It is also more subtly related to the literature around the potential for energy transitions to deepen existing and create new forms of injustice (Sovacool et al., 2019).

This paper comprises of four further sections. The next section sets the paper in context in terms of relevant literature and the methods utilised to understand the complexity of human experience in relation to domestic energy transitions across place and time. The specific methods applied are then set out and the case studies introduced before the findings from England and Sweden are presented together. The discussion draws comparisons across the two countries and the conclusion summarises the methodological and empirical considerations raised by the paper.

The value of oral history for revealing the complexity and human experience of heating change

Narratives around past heating transitions tend to operate at the grand scale (Darby, 2017), overlooking social and cultural considerations and focussing on neat linear narratives that feature *'a sequence of developments, during which average people in average buildings meekly and unproblematically [...] adapt to new infrastructures'* (Darby, 2017, pp. 126). Such stories tend to overlook complications, often related to aspects of (in)justice, such as cultural resistance to a changed way of life, economic resistance when change threatens livelihoods, affordability concerns and dissatisfaction with ineffective early systems (Ambrose et al., 2023). These grand narratives, most commonly found in formal histories, the media and some physical science outputs imply that changes to home heating impact in rapid, standardised or similar ways across places and social groups and that technological change is responsible for positive outcomes. A relevant example of a grand narrative includes the contention that the Clean Air Act (1956) in the UK (which forbade the burning of coal in most dense urban areas), relatively rapidly delivered vast improvements in air quality across the UK (Carnell et al., 2019). The reality, as established through oral histories and archival research, reveals a more mixed picture and highlights resistance to the act on economic and cultural grounds. For example, the

act was poorly observed in many parts of the UK and even actively resisted in coalfield communities, taking until the 1980s and 90s to be fully realised (Mills, 2008). A further example concerns the contention that the shift to gas central heating in the UK universally delivered increased comfort and cleanliness to households (Johnson-Schlee, 2024), overlooking the disruption of this top down, imposed change, how access to the benefits of gas heating were not (and are still not) enjoyed across all social groups and places (i.e., fuel poor households, rural dwellers, coalfield communities) and how early central heating systems were found to be ineffective in practice (Ambrose et al., 2023).

Many of the shortcomings of grand narratives stem from their neglect of the often intangible social, cultural and emotional implications of energy transition and, in relation to heating, the way they re-shape the rhythms, routines and spatial navigation of the very personal space of the home. We are, by far, not the first to highlight the cultural and emotional significance of domestic energy transition. For example, the work of Devine-Wright et al. (2014) reveals the significance of the feelings and atmospheres created by different forms of heating, such as the 'cosiness' of the coal fire and importance of having a heat source as a focal point in the home. They reflect on whether these feelings may continue to be achievable following the transition to low carbon heating. The challenge for policymakers, argue Devine-Wright et al. (2014), is to ensure that environmental values do not run counter to cultural values around the making of home and, as argued by Waitt & Harada (2019), that we appreciate that struggles with energy affordability impact the role of home as a sanctuary. Other literature focusses on the impact of energy transition on the sensory aspects of the home: for example, Hine et al. (2007) suggest that interventions aimed at highlighting the health risks of wood smoke may prove ineffective in the face of the positive affective associations with wood heating in Scandinavia. More recent research by Karlsson et al. (2020) and Ambrose et al. (2023) further explores the emotional motives of fireplace usage, finding that the pursuit of cosiness was a key driver of resistance to heating change. Together these studies demonstrate how historically grounded studies often reveal the roots of preferences and actions in the present and flesh out grand narratives about compliance with change, providing examples of resistance and loss associated with transition.

Of course, the messy reality of heating change also extends to concerns about economic injustice, at the level of the community and the household. For example, concerns that changes to energy infrastructure will restructure the local economy, as explored by, for example, Rohse et al. (2020), whose work highlights how past experiences of economic restructuring may leave communities particularly sensitive to this possibility on a practical and emotional level. And, of course, concerns about the impact of energy transitions on energy affordability are widely explored in the literature, with some commentators more optimistic about the potential for the transition to lower carbon energy to alleviate fuel poverty than

others (Lippert & Sareen, 2023). However, there is an added dimension to affordability concerns that is often overlooked, but that historical methods are capable of revealing, and that concerns how expectations regarding the cost of energy, the warmth of the home and practices aimed at frugal use of energy are all forged and embedded in formative years and will affect how low carbon domestic energy transitions are appraised and received (Butler et al., 2014; Goodchild et al., 2017).

Such illustrations of the deep complexity of domestic energy transitions, which emerge once you stray beyond the purely techno-economic dimensions, leads Darby to call for more emphasis on personal stories of energy transition, which are *'more than peripheral to the serious business of energy policy and transition'* (Darby, 2017). We support this sentiment but go beyond this to argue that personal stories that take account of the past and the origins of current expectations, preferences, practices, routines, views etc. are what is required to better understand how domestic energy transitions are likely to be received and unfold, embracing the overlapping layers of temporality within our relationship with heating.

For this purpose, we consider oral histories to represent an effective methodology. Oral history participants are encouraged to reflect freely and in as much detail as possible on their experiences over time. In this sense, they differ from the type of qualitative research (often the semi-structured interview, situated in the present) that we typically see within energy studies (Goodchild et al., 2017). Oral histories therefore enable the construction of what are sometimes described as *'effective histories'* (the opposite of formal histories) which prioritise detail and complexity over neat narratives (Veyne, 1997). Effective histories are important antidotes to traditional domestic heating research which can be said to suffer from *'presentism'* (biases towards the present as the dominant system of rationalisation), which neglects the historical conditions of our existence and important questions about how we have arrived at our current situation, what the are possibilities for a different future and in what ways should our future differ from the past? (Mahon, 1992).

A number of studies attest to the value of oral histories or historical approaches to the study of home heating. For example, Goodchild et al. (2017) and Butler et al. (2014) revealed a strong relationship between experiences of home heating during childhood and present routines, practices and preferences, alluding to the long-term influence of home heating practices and technology. i.e., wearing multiple layers to bed, rationing heating use regardless of wealth and preferences for open fires all stemmed from early experiences (Goodchild et al., 2017). Here, a historical approach provided an alternative to the snapshots of one point in time which characterise energy research and in doing so, reveal the origins of entrenched practices and preferences, some of which may form a barrier to low carbon transitions (Ambrose et al., 2017).

Similarly, storytelling has also become more common in energy research (Gordon et al., 2017). In particular, Janda & Topouzi (2015) note how

particular narrative structures dominate in energy studies and highlight the dominance of energy-efficiency ‘hero stories’, which, much like grand narratives, feature tales of staggering energy efficiency successes, usually attributed to technology. In light of this, the authors call for more ‘learning stories’, which reveal the unintended (and often unseen) consequences of policies and initiatives and avoid underplaying deviations from predictions. Oral histories can help in terms of the elicitation of learning stories, by allowing the participant to take the lead and affording them time and space to do so in detail, with the researcher assuming a passive position.

Methods

The oral histories presented here were gathered as part of a larger study: *Walking with Energy*, an Anglo-Swedish project focussed on how, in the Global North, our relationship with energy is growing more distant and less tangible. Through the project, we experimented with participatory methods to (re)engage citizens with the sources of their everyday energy and the related environmental and ethical debates. Through this and the growing body of literature examining the long-term influences of energy transition in our everyday lives, we hypothesised that our progressive disengagement from energy is rooted in the past, driven by changes in heating technology and associated interfaces and energy market structures (i.e., pricing and payment methods). This prompted a sub-study focussed on oral histories of heating.

Case studies: England and Sweden

Although the participating countries were inherited from the broader project, they enable an illuminating comparison of the experiences of heating users across countries which have historically adopted different heating transition pathways. Households in both countries continued burning wood (Sweden) and coal (England) until well into the 20th century, but from the 1950s, Sweden favoured communal heating systems (fuelled by burning household refuse or gas) in urban areas, distributing heat and hot water via underground pipe networks (Werner, 2017). At around the same time, the UK opted for reticulated natural gas networks in urban areas burnt in individual gas boilers in each home to power central heating systems. These choices have contributed to markedly different outcomes in terms of heating affordability and energy poverty levels across the two countries, with England having some of the highest levels of energy poverty in Western Europe and Sweden benefitting from affordable domestic energy, despite its much colder climate (Thomson et al., 2017).

The interviews conducted in Sweden were undertaken in 2019 with elderly residents of sheltered housing schemes in the city of Lund (Scania, South Sweden). In terms of characteristics, 4 men and 7 women

participated, aged between 73 and 95. They had varied occupational backgrounds: some had undertaken unpaid domestic labour, some had worked as labourers and some had worked in academia.

The ten oral history interviews undertaken in England were primarily gathered in 2016 as part of a previous pilot project which sought to test the application of oral history methods to the study of home heating. The results were put forward for re-analysis in the context of the present study and supplemented with five further interviews conducted in 2018/19 with volunteers recruited through a workshop in a public library. Participants in England were aged between 45 and 75 and most were living in Sheffield, an ex-industrial city in the north of the country. However, many participants had moved around during their lifetimes and recounted memories of homes in various locations around the United Kingdom (UK). We spoke to even numbers of men and women in England and it should also be noted that the majority of respondents were in professional occupations, or retired from them despite being from lower income backgrounds in most cases.

It is very difficult to purposively sample participants in the context of oral history interviews. Participation requires a significant investment of time, beyond that required for a semi-structured interview or survey, for example, and also requires participants to offer detailed accounts of their past and insights into personal matters of home and family. It is therefore important to work with those who are keen to contribute. That said, we were pleased to have attracted a fairly diverse sample of participants from the point of view of gender, age and socio-economic status. Few participants had led an affluent life from start to finish, with most recounting a mixture of hard and more affluent times.

Application of the method and analysis

The oral history interviews conducted in both countries followed a common approach. The conversation began with an open question about the participant's earliest memory of keeping warm at home. To move participants along chronologically, we adopted a housing pathways approach, whereby participants were prompted to reflect on the heating arrangements in each of the homes they had lived in during their lives (Clapham, 2002). Oral history affords the interviewee the space to recount their own story in their own way (Maye-Banbury, 2021). As such, the researcher only occasionally posed questions to keep the account moving, seek clarification or probe deeper. The interviews were recorded and transcribed. Most interviews lasted between an hour and 90 minutes, sometimes more.

Analysis of the data followed a hermeneutic circle approach, which required the interpretation of the data on two levels (Goodchild et al., 2019). The first level of interpretation involved understanding the accounts as life stories of the individual and the second, as thematic stories that

go beyond the immediate intentions of the respondent (Rosenthal, 1993) and draw out the broader societal changes reflected in their individual trajectories. As life stories, analysis must allow respondents' accounts to speak for themselves and the first stage of interpretation therefore involved inductive manual open coding informed by our first reading of the oral histories and the themes that stood out. Quotes from respondents were then used to illustrate the themes. The second level of interpretation involves shaping this into a written narrative looking for synergies, and divergences between the different accounts gathered. The next two sections of this paper present this narrative, with data from England and Sweden presented together before comparisons are drawn in the discussion.

Heating transitions across place and time: data from England and Sweden

Early memories – the universality of cold homes

Participants who grew up in the UK, almost universally recounted draughty housing with basic heating infrastructure (open fires or free-standing heaters) in childhood homes. This, they recognised, represented a barrier to heating homes effectively and efficiently, even for those in more affluent households. Participants made frequent reference to draughts, damp, and condensation:

It was single glazing so every morning it would be dripping wet with condensation in the winter. I remember my mum leathering the front window in the bay every single morning because it was so wet. David, 52, UK

I think there were a few winters where there were quite prolonged periods of being cold and that was quite hard actually. There were times when we did actually have the gas stove and the open fire on at the same time in the one room and we would do things to try and stop draughts coming in. Peter, 52, UK

The problem with the flat was that it was damp and it was pokey. It wasn't particularly comfortable and took quite a bit of warming. John, 63, UK

Despite expressing dissatisfaction with the warmth and comfort of their childhood homes from their current vantage point, most older participants acknowledged that they would not have questioned these conditions at the time. David stated that it was '*just how it was*' and Elaine (60) emphasised that '*you never really thought about it, you just thought it was cold*'. However, those, such as Nadia (45), who recalled feeling cold at home in the 1980s, by this point had reference points in friends and neighbours with gas central heating and the means to use it, leading her to feel less accepting of being cold and more frustrated at being left behind.

By the 80's everyone around me had central heating but we didn't. We had never really questioned using one gas fire and sitting in front of it together on a rug to eat dinner. But gradually we were left behind and i started to notice how cold we were. Nadia, 45, UK

It appeared to be less the case that people did not mind being cold, but more that there was no expectation of being warm. Richard (66, UK) referred to his family's attitude to the temperature in the house as one of '*it's cold, so what?*'. Cold homes were not generally viewed or experienced as a hardship, and it appears that cultural attitudes to heating and warmth might have prevented those with the means to heat their homes to a higher temperature from doing so:

It was a bit of a social-cultural shift and an expectation around the warmth of the home. There's just been a shift in the notion of what is reasonable and expected so I don't think it was a financial calculation. (Richard, 66, UK).

Early memories of keeping warm at home had a different starting point amongst participants in Sweden, where most people began with reference to the defining geo-political event of the second world war. This period was memorable because Sweden experienced severe winters during this period whilst at the same time everything (including fuel) was in short supply. Several participants recalled using blackout curtains, which were connected with both a fear of a bomb attack, but also provided insulation:

Yes, it was the blackout curtains ... you had to hang blackout curtains on the windows so it [the house] would not be visible ... but then it would be warm inside too and the warm air did not leak. You had to have the windows covered, otherwise you could not have the candle lit inside. During the war the lighted candles was a sign that it was a residential building, so you needed to cover the windows. (Anna, 89, Sweden)

This quote also suggests that homes in Sweden during this period were, as in the UK, also draughty and that curtains acted as draught excluders.

Cold water

A strong theme within the accounts from Sweden, concerned access to warm water to wash body and clothes. For many, this seemed to represent a bigger challenge than heating the home and was a memorable source of discomfort.

We froze, but it was due to the cold water. Everyone used cold water you know. You did not have hot water... On the kitchen stove we had, next to a water reservoir, you had a copper tank with a tap and when you set a fire underneath it, the water became hot. So you had hot water when you cooked something on the stove. But when you washed in the morning you had no hot water. (Alice 85, Sweden).

The biggest difference between now and then is the warm and cold water. It is such a difference to when I grew up, you cannot compare it. You had to boil all water. (Lena, 95, Sweden)

You did not wash so often either, but you often avoided washing or doing laundry when it was the coldest outside. It had to lie unwashed until it got warm outside and then you had to wash a lot at once. And you could not wash so often, it was much dirtier than it is today. (Anna 89)

It seems that the cold indoor environment was easier to manage by putting on more clothes, whilst the problem of water heating was more difficult to solve. Water could, of course, be boiled to warm it up, but presumably this would have placed additional pressure on fuel supplies.

The era of solid fuels- wood and coal

All participants, with the exception of the youngest, recalled relying on coal and/or wood during childhood, and the labour related to moving and storing it and cleaning and maintaining fires:

Mum and dad had to do a lot of making the fire every evening, and chopping kindling, and dragging coal in and out. It's what everybody did in those days. (Jane, 74, UK)

There were also clear memories amongst UK respondents of periodic deliveries of fuel and the careful rationing of supplies:

You had to manage on the amount of coal you ordered, you weren't going to order more before the next delivery was scheduled (Elizabeth, 70, UK)

By contrast, those who grew up in rural Sweden had common access to woodland for fuel. Urban dwellers, on the other hand, relied on deliveries of wood (sometimes just once a year) in the same way that households in the UK received deliveries of coal. Fathers were generally responsible for fetching wood from the forest. And it seems the whole family would be involved in chopping, storing and drying the firewood.

We bought firewood once a year, one two three cubic meters. We put a huge, like tarpaulin, on the lawn when it was still winter. Then you had to devote yourself to chopping, sawing and more chopping. Then it would lie and dry somewhere inside before you could use it. (Maria, 79, Sweden).

Urban dwellers in Sweden were more likely to recall a scarcity of wood and coal due to rationing during the war. This was not the case for those living rurally, who had access to forests. It was also common in Sweden to use coal and wood on the fire.

Gendered roles

In the UK, as in Sweden, women were responsible for domestic labour, and keeping the family warm by maintaining fires but also (primarily in

the UK) by knitting jumpers and blankets. As David (UK) put it, *'I recall a regular production line of jumpers being knitted by my mum.'*

It was the women who would get up first and get everything ready so it was warm for when the kids got up and also when the man woke up. (Maria, 79, Sweden)

Even if he got up first, it was her job. (Alice, 85, Sweden)

Several participants recalled their mothers doing the washing by hand, sometimes in cold water. Peter described this as a *'real slog'* for his mother, and both him and Elizabeth recalled the purchase of a washing machine as a liberating event. The increasing affordability of appliances like washing machines, combined with the advent of central or district heating, appeared to create opportunities for women to participate in paid employment, alongside their domestic labour:

I think it was the combination of central heating and things like washing machines that allowed by Mother to get a part time job in a greengrocer, which was good for her and good for us all financially and otherwise. (Jane, 74, UK)

In Sweden, fathers were remembered for doing the heavier manual tasks such as bringing home logs, chopping wood and *'insulating'* the house by shovelling snow up against the walls. In the UK, there was more evidence that women and children were responsible for managing the fuel supply and moving coal and storing it.

The move away from solid fuels

For participants growing up later (in the 1960s and 70s) across both countries, there was a clear sense that throughout their lives, the process of heating the home became progressively less tangible, less time-consuming, and more convenient. After the era of wood and coal, respondents in Sweden recalled a period where oil was used for heating, which was remembered for being cleaner and more convenient. This era was short lived and district heating soon became the dominant heating system in urban areas (where many dwellings are heated via a network of pipes fed by a single, communal heat source). During the 1950s and 1960s, urbanisation accelerated in Sweden and many interviewees previously living in the countryside moved into flats with district heating.

In the UK, the transition away from open fires seemed to begin before gas central heating became widespread (from the 1970s onwards) with other modes of *'free standing'* heating such as paraffin heaters, electric heaters, gas fires and even electric blankets becoming more common during the 1960's and 70's (remembered by Peter as bringing a step change in comfort). As a result of the greater availability and affordability of these kinds of supplementary heat sources, reliance on coal and wood fires

waned. Yet, plug in heat sources did not address the problems of uneven warmth throughout the house. For example, Nadia's childhood home was heated by free standing gas fires, but use of them was rationed due to affordability. It was therefore only possible to heat one room, which became the nucleus for family life:

The gas fire was almost like a focal point we used to lay a cloth on the floor and then we would put our food out on it and we used to sit around it. (Nadia, 45, UK)

As gas central heating covering the whole home became more common (but not universal) in the UK in the 1970's and 80's with billing for usage undertaken on a quarterly basis, Elizabeth, Jane and Elaine all reported a fear of using too much. This fear was more profound than earlier concerns about the coal or wood supply not lasting, because it was harder to estimate how much was being used. Use of such systems was seen as '*new-fangled*' (Elizabeth, UK), or '*a treat*' (Jane, UK).

For some respondents, like Elaine (UK), the financial impact of the transition away from solid fuels was felt more acutely because her family had enjoyed many years of free coal as part of her father's employment by the National Coal Board.

The culture of frugality which began during the era of solid fuels and intensified with the advent of gas central heating, appeared entrenched for many participants. For example, Elaine still worried about using the central heating too much even though she was now able to afford it: '*I never put the heating on unless I'm really, really desperate*'. This was because it is difficult to know how much is being used, whereas with '*a heat source which you can hold in your hands, you knew where you were*'.

The situation was different in Sweden, where from the point that district heating became widespread, households rarely thought about heating or the associated costs after that point. Heat was in plentiful supply and usually charged at a flat rate as part of the rent and was felt to be inexpensive.

We got central heating. We had no worries about the heat. We received the bill twice a year, but it was not so much money. (Simon, 81, Sweden)

This came in the 50s, since then it has been like this. It is something you take for granted, it has been an obvious, less reflected part of your life. Not much thought is given to it. (Anna, 89, Sweden)

From this point, our interviewees in Sweden did not know how the heat they used was produced or what fuel was used in these centralised district heating systems. This invisibility was not helped by the fact that the heat was generated in power plants located miles away.

Lost practices and unused rooms

In Sweden, the transition away from solid fuels to district heating led to the loss of old heating practices. Before the time of central and district

heating, varied heating practices were recalled and keeping warm was a daily labour, whether it was obtaining and handling fuel and building fires or reducing heat demand by putting on clothes, putting wadding in the window frames, gathering around the stove when cooking, shovelling snow around the house, or putting thick curtains over the windows.

A common technique in Sweden and in the UK pre-district and central heating, was to seal off one or several rooms during winter to avoid heating them, a practice that endured until the 1970's and 1980's in some households. Until this point, it was common to have a room that was not used in the house or the apartment during winter.

It was the 'fine room', it would just stand there. You could not be in that room. The 'fine room' was not allowed to be used. It was always cold. I do not really understand how you could have it so cold because it must have destroyed the wallpaper and everything. Perhaps it simply costed too much to fire up the whole apartment. (Nancy, 90, Sweden).

It appeared this act of reserving a 'fine room', was not just about energy saving, as these rooms were off limits all year round. It was speculated that this may also have been aimed at demonstrating that a family could afford to have a room reserved for 'best' or to maintain cleanliness in at least one room.

Participants in the UK clung tighter to practices mastered during the pre-central heating period, such as switching on the heating only when the temperature becomes unbearable.

A return to tangibility?

While participants in Sweden continued to benefit from a plentiful and affordable heat supply, and therefore perceived no need to change their heating arrangements, there was a discernible trend among participants in the UK back towards more tangible forms of heating. Around half of those interviewed had installed wood or multi-fuel burners in their homes, albeit usually as a supplementary heat source in addition to central heating. This was primarily an aesthetic choice, born of a desire to mimic the sensory experience of childhood homes. For some this brought a partial return to a sense of tangibility and control in relation to heating, with Elaine, John, Nadia and Richard describing portioning out wood supplies to ensure they lasted the winter. Elaine described how she liked the discipline of buying two bags of coal per week and making it last, and had returned to a similar system with her wood-burning stove:

It was much more efficient and I liked it, two bags of coal, I knew where I was. And then you know, in the summer I would still buy two bags of coal to save it up for the winter. So, I used to buy the same the whole year round so that I knew I'd got enough. Then again for me it was about knowing I've got enough money to pay the bill. But even now we've got central

heating and a wood burner, and we use our own wood from the garden.
(Elaine, 60, UK)

Despite general satisfaction with the current arrangements in Sweden, participants there spoke wistfully about their memories of the fireside and even tried to recreate it, with the residential home we visited playing a video of an open fire constantly on the TV.

Discussion

Diverging heating pathways

Cold homes appear universal across the two countries in the pre-central and district heating era, seemingly regardless of place or social class. Strategies to mitigate the impact of cold homes were also fairly consistent across the two countries and included closing the curtains, knitting jumpers, draft excluding and closing off some rooms. Only shovelling snow around the house as insulation was specific to Sweden. We do, however, see some differences in relation to accessing adequate fuel across place, with those living in rural Sweden seemingly less likely to recall anxieties around heating costs and fuel availability in the challenging conditions of the 1940s and 50s due to their freedom to gather fuel in nearby forests. A period of common access to fuel is not within living memory in the UK, with the exception of concessionary coal allowances in mining communities. As households recall transitioning to gas central heating (UK) or district heating (urban Sweden), accounts and outcomes across the two countries start to diverge notably, characterised by higher exposure to energy poverty in the UK and very low levels in Sweden (Thomson et al., 2017).

In the UK, the drive to carefully manage fuel consumption has never gone away, even as households grew more affluent. Whereas in Sweden, affordable district heating in urban areas, often charged at a flat rate and included in the rent (von Platten & Palm, 2023), meant that many households never had to worry about comfort or heating costs and their practices for managing the cold became obsolete. Heating appears to have largely disappeared from the consciousness of respondents in Sweden—arguably reflecting the country's success in assuring energy affordability, for urban dwellers at least. Amongst our participants it appeared that grand narratives around the success of district heating in Sweden ring true. Although it appears that it is the combination of the technological/system solution (district heating), low-cost fuels (i.e., domestic waste) and the financial model adopted (flat rate for heating) that has enabled this success, rather than purely the technology itself.

UK households, on the other hand, reveal the transition to gas central heating to be less consistent with grand narratives that hail the virtues of technological advancement. Many still experience thermal discomfort

and actual or feared affordability issues despite gas central heating being widespread. Home heating remains squarely in their consciousness, necessitates the maintenance of coping strategies to the present day as reflected, for example, in Elaine's rationing of firewood and reluctance to use her heating. Partly the endurance of these practices might be attributed to the strong influence of practices learnt in childhood, as observed by, for example, Goodchild et al. (2017) and Butler et al. (2014) and which have become culturally ingrained, but there is little doubt that participants in the UK still worried about energy affordability.

Clinging on to bygone eras?

Reflecting the idea that there are overlapping layers of temporality at work in our relationship with heating (Goodchild et al., 2017), the evidence suggests that times of energy scarcity and hardship can act as reference points throughout life, against which current levels of comfort are judged. Yet, accounts from Sweden suggest that these reference points in the past can be forgotten when affordable warmth is assured and where the change on offer (i.e., district heating replacing wood burning) delivers substantial private benefits (abundant, affordable warmth) over the status quo, a vital prerequisite of a persuasive transition (Fouquet and Pearson, 2012). The oral histories appear to support the contention that once the new system on offer is compelling to the individual or household (whether they realise this immediately or later), changes to the rhythms, routines and spatial organisation of the home follow with relative ease, even when they demand shifts in how we make home. Participants in this study (in Sweden) did not widely express wistfulness for past eras of heating and the routines and lifestyles they enabled, commenting instead that heating the home was no longer in their daily consciousness. However, other studies have identified cultural attachment in Sweden to the burning of wood and the sense of 'homeliness' this helps to create (Hine et al., 2007; Karlsson et al., 2020), but with others suggesting that this may have become more of a holiday pursuit than a part of the daily routine (von Platten & Palm, 2023). The evidence from the UK, on the other hand, demonstrates the strong pull back to burning solid fuels in log burners, not as an occasional activity, but as part of the daily heating regime. This finding reflects the views of Devine-Wright et al. (2014) that heating practices favoured for creating a sense of homeliness may clash with environmentally driven heating change. However, the trend towards log burners in the UK is curious in a cultural sense, given the country has no recent tradition of burning wood and is heavily deforested, suggesting that cultural conventions around heating the home and home-making can be borrowed or transferred from other places and cultures.

There is also suggestion within the data that it was perhaps not single changes in heating technology alone that were responsible for some of the transformations recalled. For example, it appeared to be the

combination of central heating and washing machines that eased domestic routines, the combination of central heating and electric blankets that made bedrooms more comfortable and the combination of central heating plus additional sources of entertainment within bedrooms (i.e., radio, television) that led to families dispersing around the home. This suggests that the most far-reaching changes in our home lives occur when a range of complementary technological innovations combine.

Interactions with wider socio-economic change

Later urbanisation in Sweden and linked to this, a more modern urban housing stock, coupled with the greater efficiency and lower costs of district heating, appear to have combined to liberate participants from the labour, discomfort and anxiety of cold homes. We therefore see how broader socio-economic change (i.e., urbanisation) combined with efficient energy policy responses to the growing urban population (i.e. district heating) continue to influence the comfort and financial circumstances of households in Sweden today. By contrast in the UK, a new heating technology (central heating) applied to an ageing, uninsulated housing stock brought about significant change but produced less transformational results. In this sense, we are reminded of how opportunities to maximise the positive impact of transitions can be missed, particularly if the full range of implications for households are not carefully considered.

In participants' accounts, we see evidence of all the temporal levels of change identified by Goodchild et al. (2017): the relatively long-term influence of technological change (central/district heating), changes in line with the life cycle (i.e starting a family, retirement etc.) and the impact of more sudden changes or shocks (i.e., war). What is missing from this framework and which comes through in our data, are the gradual but profound shifts within the labour market and how they interact with the gendered nature of home heating. There was clear evidence within both sets of interviews of the binary division of labour in the pre-central/district heating era whereby women occupied the role of comfort manager identified by Petrova & Simcock (2021) and Sánchez et al. (2020). Fathers, on the other hand, were recalled as undertaking less routine labour in relation to warmth, such as shovelling snow or fetching wood. A number of respondents across both countries expressed a sense of injustice on behalf of their mothers - hinting at the emotional dimensions of energy hardship identified by Longhurst & Hargreaves (2019).

Getting left behind

In trying to build a coherent narrative, it is easy to overlook outlying accounts which reveal a different perspective. This is how grand narratives take hold. Nadia's story provides an example of the unevenness of the

transition to gas central heating in the UK, in the sense that there was no prioritisation of lower income or vulnerable households within the move to gas central heating. For Nadia, not having access to gas central heating when her peers did, awakened her to her family's exclusion. Her family life was structured differently to that of her peers as a result of their heating arrangements, and she did not benefit from the same level of comfort or privacy (due to the necessity to gather together around the fire).

Concluding thoughts

This study has added to an emerging body of knowledge which improves our understanding of the many ways that heating transitions shape our lives and the places we live in diverse, uneven and sometimes unanticipated ways, triggering reorganisation of societies and economies and long-lasting change. Every project that contributes data to this inquiry from the perspective of different countries, contexts and social groups helps to construct an effective history of home heating capable of challenging simplistic grand narratives and creating vital 'learning stories' (Janda & Topouzi, 2015). Building effective histories of home heating raises awareness of the ways in which the current, now very urgent transition away from fossil fuelled heating may repeat or deepen existing energy injustices or create new ones, or disrupt valued cultural practices that support home-making.

The interviews were also valuable in revealing the life-altering potential of heating transitions and revealing interactions between heating transitions and broader socio-economic changes (i.e. war, urbanisation, deindustrialisation) which have galvanised or altered the course of heating transitions. Comparing across the two countries was effective in revealing where, despite following similar heating transition trajectories, the heating histories of the two countries diverged, producing almost universal energy invisibility and affordability in Sweden whilst participants in the UK have continued to grapple with affordability problems and cold homes. This divergence highlights how similar technologies applied in different contexts and organised in different ways (i.e., as communal rather than individual central heating) produce very different outcomes over time.

The work of Darby (2017), quoted early in this paper, which explains that grand narratives tend to point to '*a sequence of developments, during which average people in average buildings meekly and unproblematically [...] adapt to new infrastructures*' (Darby, 2017, pp. 126), highlights a risk in relation to this study, in that we may not have moved sufficiently beyond capturing these average experiences through our sample. Although our participants had experienced a diversity of living conditions and changing economic fortunes over the long period recalled, most had been socially mobile and ended up in a relatively privileged position. This did not, however, mean that some (in the UK) were not still grappling with

affordability fears and thermal discomfort – a striking finding in itself, suggesting that the UK has arrived at a position where even relatively prosperous households cannot access energy affordability and thermal comfort unchecked.

To be true to the ethos of effective histories, care must be taken to include a wide range of socio-demographic groups within future studies of this nature, something that could have been improved in relation to the present study. In doing so, it is possible to identify the ways in which heating transitions play out unevenly between different types of households and to better understand the consequences of being left behind and generating important considerations for the achievement of greater equity through the present transition.

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