THE CONNECTED HOUSEHOLD:
UNDERSTANDING THE ROLE OF AUSTRALIAN HOUSEHOLDS
IN SUSTAINABILITY AND CLIMATE CHANGE
Climate change is now widely recognised as the pressing global issue of the next fifty years, requiring social and cultural as well as scientific solutions. The project this report summarises aimed to build adaptive capacity for climate change mitigation and adaptation, using cultural research. We focused on the Illawarra, a region central to Australia’s carbon economy. We undertook a baseline study of current knowledge of climate change and tracked community response over a period of five years from 2009 to 2013. We identified social and cultural resources for, and constraints to, more environmentally sustainable behaviours, with an aim to contribute to policy solutions. The project provides a basis for regional and international comparisons.

Specifically, the project’s five stated aims were to:

1. Undertake a baseline study of current knowledge of climate change in a regional community. The Illawarra is both a microcosm capturing the diversity of issues afflicting Australia as a whole, and a region that can act as an ‘experimental laboratory’ for identifying and developing options for the future.

2. Track the response of that community to these challenges over a period of five years, by recording and analysing narratives of success and failure, resilience and vulnerability, engagement and apathy.

3. Identify existing cultural resources for, and constraints to, more environmentally sustainable behaviours.

4. Provide new knowledge to contribute to the emerging suite of necessary local, regional and national policy initiatives.

5. Provide an archival base for longitudinal studies over coming decades, and an exemplar for comparable regions in Australia and overseas.

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How well do we understand households in environmental policy? Households make sense both to the people who live in them, and to government policy makers, as foundational social units, and as sites through which it is logical to understand the consumption of energy, water and materials that have implications for sustainability issues such as climate change. In affluent urban societies households are an increasing focus of government policy in relation to sustainability issues, and an expanding research literature considers the household as a crucial scale of social organisation for pro-environmental behaviour.

In Australia we have seen activity at all levels of government, including support for solar panels, home insulation, water tanks, light globes and shower timers. Local councils have established programs such as Sustainable Illawarra’s Super Challenge, in which householders were encouraged to become more environmentally sustainable by engaging in activities such as refusing plastic bags, composting, establishing vegetable gardens and catching public transport. The marketing materials used phrases like, ‘take the challenge to see just how easy it is to take control of your ecological footprint. You’ll be surprised at how little time it takes to make a difference ... and how good it makes you feel!’ (Sustainable Illawarra 2008).
It’s not so easy being green

Despite the enthusiasm of many Australian households to contribute to sustainability goals, such policies do not always have the intended outcomes. Smart meters do not challenge practices that householders consider non-negotiable. Water tanks do not save as much water as predicted. Education programs emphasising that ‘it’s easy being green’ understate the amount of domestic labour involved, and sidestep the question of who does the work. Residential energy consumption continues to rise, due to a combination of bigger homes containing more appliances and IT equipment, a growing population and a declining number of people per household.

We must stop seeing households as black boxes

It is a truism that sustainability challenges are complex, but we contend that the conceptualisation of the household in environmental policy has not been complex enough. Many policy approaches treat households as black boxes – freestanding social units operating only at the local, domestic scale. The difficulty of tracking the contribution of Western households to their nations’ greenhouse gas emissions provides an illustration of this complexity. In Australia, calculations vary depending on the assumptions made about where responsibility is to be attributed: 13 per cent if only direct energy use within the household is considered, and 56 per cent if the emissions embedded in externally produced goods and services consumed in the household context are included (Australian Bureau of Statistics 2003). As the growing literature on carbon and other ecological footprints makes clear, this variation is partly an issue of data measurement and scale. But we argue here that it also stems from a broader conceptual challenge: how should we think about configurations of people and material things whose social and ecological relations are diverse, shifting and complex?

The connected household

In this project we have developed an alternative framing to the household as a black box. Instead we think of connected households, in that households are part of, and a product of, a network of connections. The black box is revealed to contain its own complex politics and practices; households are social assemblages with variable gender, age, class, ethnic and familial structures. The family with children, the student shared household, the extended family or the retired couple will all experience and respond to climate change and sustainability concerns differently, as will home-owners, private and public renters, and unit and house dwellers. Households are homes in which social relations are the core human concern. The black box is also porous. Home spaces and the people who live in them are inextricably linked into the social, technological and regulatory networks that make up suburbs, cities, regions and nations.

Zones of friction and traction

We use friction and traction to illustrate different pathways of connection. In many ways friction and traction are two sides of the same coin, but we use them here to trace less and more sustainable pathways respectively. So zones of friction may involve pathways of resistance to more sustainable outcomes, or contradictory practices which entrench less sustainable outcomes. We use zones of traction to refer to pathways towards more sustainable outcomes. Traction can result from the deroutinisation of previous practices. The term traction also helps identify useful points of intervention: policies, key players, levers, intermediaries or translators, both human and not. Examples of each are provided throughout the report. We suggest that friction and traction will help decision-makers think through the possibilities and constraints of working at the household scale – why some policy approaches do not work and others do.

REFERENCES

Cultural environmental research

In the Australian Centre for Cultural Environmental Research we apply cultural research methods to environmental issues. We understand culture as ‘a process in which people are actively engaged… a dynamic mix of symbols, beliefs, languages and practices that people create, not a fixed thing or entity governing humans’ (Anderson 1999: 4). People make and remake culture as individuals, communities and in institutions and academic disciplines. They do it in everyday practices and over both long and short periods of time. Geographic perspectives on environmental cultures pay particular attention to their spatial characteristics, their relationships to place, and their manifestation in the biophysical environment. It follows that to understand our environmental cultures we need fine-grained methodologies that enable understanding of motivations, behaviours, contradictions, tradition, change and flexibility in requisite depth. These are brought into conversation with broader trends identified in quantitative surveys. It also follows that cultural methods can be applied to the examination of how large scale institutions, economies and structures of meaning are created and maintained.

The household survey

First was a large household survey conducted in July 2009 to explore climate change in everyday life. The survey entitled Tough Times? Green Times? A survey of the issues important to households was posted to a random sample of 11,555 households, inviting an adult familiar with the running of the household to participate. The survey comprised both open and closed questions, and addressed socioeconomic characteristics, household consumption practices, everyday objects, activities and practices, and judgements of climate change.

The sample size reflected the need to generate approximately 200 useable survey returns from each income quintile range in the total population, to permit statistical testing, based on an expected overall return rate of 10 per cent. The actual return
rate was 12.67 per cent (n: 1 465). Respondents were statistically representative of the total population sampled; and returns were therefore not weighted. Quantitative analysis was conducted using Statistical Software Package for Social Sciences (SPSS) and included a variety of statistical tests and computations (see Waitt et al. 2012 for further detail). When we refer to ‘our survey results’ throughout this report, it is from this large quantitative activity that statistics are drawn.

Longitudinal ethnography

Throughout this report we also draw on qualitative ethnographic work in a series of inter-related projects. These projects revealed the nuances and contours of households and the dilemmas of sustainability in everyday life. One major project was an in-depth longitudinal ethnography of households in Australia. Interviews and observations were conducted in 16 households every three to four months between January 2010 and November 2011. Discussions covered a range of everyday practices such as shopping and laundry. Households volunteered to participate in the longitudinal research following the above postal survey on household sustainability. To an extent, the recruitment process meant that participating households were likely to be engaged with environmental issues and to be participating in recycling, water conservation and other mainstream environmental practices. All were concerned with, and practised, some degree of resource stewardship. All were concerned with environmental degradation, and some were engaged in local sustainability initiatives. Our household participants represent a range of occupations, incomes, educational attainments, sexual and ethnic identifications and household compositions.

Other samples

Other samples were derived as complements to this main ethnography, on which we draw here for more specialist purposes. These in-depth studies draw on over 200 interviews in total. One was extended family households (interviews conducted with 17 participants from ten households) living in owner-occupied, detached dwellings in suburban settings. This sample provided insights on the unique challenges faced by households of larger than average size, combining family units, as well as inter-generational relationships (see Klocker et al. 2012 for further detail and explanation). Another was a sample of six environmentally-committed households participating in, and recruited through, Sustainable Illawarra’s Super Challenge Program – these households were the focus of a specific sub-project on gender and time, and who does the work of sustainability in the household. A mixed method approach included a combination of home tours, diaries, photography, video camera logs, time charts and in-depth interviews (see Organo et al. 2012 for further detail). At various points throughout this report we also draw on more specialist and/or allied ethnographic projects that we or our postgraduate students have pursued: on solar hot water (in collaboration with CSIRO’s Peter Osman), water tanks (Moy 2012), clothes (Gibson and Stanes 2010), cars (Waitt and Harada 2012), tomatoes (Roggeveen 2012), and kangaroo meat (Appleby 2010).

Ongoing research

During the course of the project it became apparent that there is an ethnic diversity gap in much household sustainability research. One of the major spinoffs of this project is another one focusing on ethnic and religious diversity in household sustainability and climate change response. The Diverse Cultures, Diverse Households pilot survey was conducted in seven languages: English, Traditional and Simplified Chinese, Vietnamese, Filipino, Hindi and Arabic. In the first stage, hardcopy questionnaires were distributed to 3000 households across Sydney and Wollongong using a surname-based method to identify householders of diverse ethnicities. In total, 676 useable surveys were returned. The respondents were split into the following broad regional ancestry categories: Anglo-Australian (n=239); NE Asian (n=100); South & Central Asian (n=79); South East Asian (n=65); North-west European (n=44); North African and Middle Eastern (n=36); South-east European (n=36); and Other (n=77). Further research is being planned to build on this pilot study and to increase the representation of some of the smaller ancestry groups. Quantitative data were analysed using SPSS.

It is to the seemingly ordinary, everyday people in the household that we now turn. Quotes are used from our interviews as exemplars of wider trends. Pseudonyms are used to protect the anonymity of participants.

REFERENCES


WHO DOES THE WORK OF SUSTAINABILITY IN THE HOUSEHOLD?

Key Messages:

- It’s often women, the poor and the elderly who are doing more than their fair share of heavy lifting when it comes to household sustainability.
- Households earning less than $250 per week are more likely to undertake sustainable household practices — but not all such households profess ‘green’ attitudes or sensibilities.
- High levels of consumption in affluent households make practical sustainability difficult.
- Women spend more time than men on sustainability practices.

Households are an increasing focus of government policy in relation to sustainability issues. Education campaigns promote the idea that ‘it’s easy being green’. But such policies and campaigns obscure the issue of who does the work. Our research found that when it comes to sustainability in the household, it’s often women, the poor and the elderly who are doing more than their fair share of heavy lifting. We can approach this issue at the broad scale, via our survey results, and by looking inside a smaller sample of households.

Low income earners and the elderly

Our household survey revealed that households earning less than $250 per week are statistically more likely to undertake sustainable household practices. They switch off lights in unoccupied rooms and put on extra layers of clothing before turning up the heating. They are more likely to repair than replace clothing. They are less likely to use an air-conditioner in summer, and much more likely to save water by taking shorter showers.

But not all such households profess ‘green’ attitudes or sensibilities. And the poorest households were most likely to be uninterested in climate change as an issue. Ethnographic research throws light on this apparent conundrum. Often these households are influenced instead by generational or socio-economic backgrounds of frugality and thrift. They hate waste, and have many creative ways to save and reuse materials and other household items. The poor – particularly the elderly – are also more vulnerable to the impacts of climate change. They suffer heat stress in summer, and have to make hard choices between heating and eating in winter.

In contrast, households earning over $1700 per week are over-represented in the group undertaking fewer sustainable practices. Affluent well-educated households are more likely to profess pro-environmental attitudes, but their high levels of consumption make practical sustainability more difficult for them. They are more likely to own two or more fridges, and plasma screen TVs. Baby boomers are the least likely to be sceptical about climate change, but the most likely to fly often.

Retirees should also be mentioned here. Many studies have found that consumption expenditure decreases on retirement, even when the transition has been well planned financially. A New Zealand study showed a decreasing per capita footprint (due to decreased resource use and waste production) in the 65+ age cohort, compared to those aged 15-64 (McDonald et al. 2006). Retiree households, whether single or couple, are likely to ‘downsize’ to a smaller house or apartment once children have left home. This process can have a significant role in reducing greenhouse gas emissions.
The idea that sustainability is solely a middle-class preoccupation is not borne out by our research. Our household survey revealed higher levels of sustainability action among less affluent households, households living in detached dwellings and households organised by women (Waitt et al. 2012).

**What role does gender play?**

In the winter of 2009 Vanessa Organo undertook fieldwork with six households participating in, and recruited through, *Sustainable Illawarra’s Super Challenge*. These households all had young children, with fathers working full-time and mothers working part-time. In these households we found that sustainability became a highly gendered practice because of the different roles in homemaking. Women spent more time on sustainable practices and did so more often.

Many participants stressed how women, as homemakers, implemented sustainable practice through making most of the decisions regarding household purchases and organising household rhythms. Michelle said “I have made a conscious choice to stay and be the focal point, [so that] everybody’s time is managed...I make all the cleaning and shopping decisions as I do 99 per cent of the household shopping and 95 per cent of the household cleaning”.

Results showed that women were more frequently engaged in cleaning/laundry and cooking, recycling, switching off lights and appliances, composting and using the compost and/or worm farm. Most of the household sustainability work conducted by men is in the realms of gardening and transport. Men collectively also spent more time working with chickens and in the chicken coop.

**Time and gender**

These results were consistent with other research that shows gendered patterns of temporalities within households (Davies 2001). Women experience time as overlapping and fragmented, with no distinction between work and leisure. They more frequently bear responsibility for mediating household schedules, whereas men’s domestic work has tended to be more project orientated. Our research showed that men contributed to sustainability practices mainly through activities understood as leisure, in longer blocks of time. We also found that while men were often responsible for the labour and upfront time required to start or research a sustainability project, the responsibility of everyday implementation and habit-changing commonly fell to women. This was evident in Darren and Megan’s household. Darren said “I do more...experimenting with things. And Megan does more of the things in our routine — she does it all”. This example raises the issue of the different types of time required for sustainability work. We discuss this further on pages 30-31.

More research is needed on low income and elderly households and their adaptive capacities. We are continuing this research in collaboration with UOW’s Sustainable Buildings Research Centre. More research is also required on gender, time and sustainability issues. For example, these results could be compared with households in which both parents are working full-time, or those without children.

**REFERENCES**


Key Messages:

• People’s attitudes towards the environment – and the ways in which they run their households – are influenced by the social, economic, political and environmental contexts in which they grew up.

• The frequency with which respondents reported pro-environmental behaviours decreased with each successive generation, from Silent Generation (those born in 1944 or earlier) to Gen Y.

• Silent Generation householders are undertaking a lot of the work of sustainability, but are not necessarily doing so intentionally.

What’s generation got to do with household sustainability?

Attitudes towards the environment and concerns over environmental problems differ across generations. The ways in which people live their day-to-day lives is also shaped by householder generation in complicated ways.

Generational thinking

While age is an important factor influencing environmental attitudes and behaviours, generation may be even more important. Generations are groups of individuals identified by the time period in which they were born. People’s attitudes towards the environment – and the ways in which they run their households – are influenced by the social, economic, political and environmental contexts in which they grew up. So, for instance, people who grew up during times of recession, scarcity or war, are likely to be more frugal and thrifty than those who grew up during economically comfortable times. Meanwhile, today’s young adults were raised during a time when the reality of climate change became more widely accepted. They are likely to carry these attitudes with them throughout their lives.

Respondents to our household sustainability survey were split into four generational groups:

- Generation Y: born between 1975 and 1991, aged 18 to 34 at the time of the survey.
- Generation X: born between 1965 and 1974, aged 35 to 44 at the time of the survey.
- Baby Boomers: born between 1945 and 1965, aged 45-64 at the time of the survey.
- Silent Generation: born 1944 or earlier, aged 65+ at the time of the survey.

Attitudes towards the environment and climate change

Existing research suggests that pro-environmental attitudes are more common among young adults. While our overall results did support these trends, our findings were more mixed and dependent upon the type of environmental attitude being explored.

Younger adults (including Generation Y and Generation X) were far more likely to believe in climate change, and be concerned about its impacts, than Silent Generation householders. Many Silent Generation respondents indicated that the possible effects of climate change were too far in the future to concern them. Many also believed that the local-level efforts to combat climate change are meaningless if other regions and countries
persists with high emissions. The same pattern was observed with general environmental attitudes. Younger adults were most likely to fear imminent environmental disaster, while Silent Generation respondents were mostly likely to think that the likelihood of environmental crisis has been exaggerated. But, on the other hand, Silent Generation respondents were more likely to express pro-environmental attitudes and concerns about transport than the younger generations were; and were particularly concerned about the environmental impacts of air travel. And all generations were strongly committed to the importance of recycling.

For Generation Y in particular, concerns over the immediacy of climate change co-existed with a sense of pessimism about society’s ability to address the issue. Less than one-third of Generation Y householders thought that a decrease in greenhouse gas emissions by 2030 was likely, compared to more than half of respondents in the other age categories. The presence of environmental concern and pessimism among young adults is worrying because it may foster a sense of despondency and contribute to inaction.

Household sustainability across generations
At the same time as young adults have been applauded for having pro-environmental values, existing studies have raised concerns about the environmental implications of their (allegedly) consumer-oriented lifestyles and throw-away mentality. Our research compared the everyday domestic sustainability of households, across generations, based on five key themes: turning appliances on and off; cleanliness; purchasing; divesting and reusing; and moving around.

Overall, we found that the frequency with which respondents reported pro-environmental behaviours decreased with each successive generation, from the Silent Generation to Generation Y. So, Silent Generation householders were most likely to report pro-environmental behaviours, and Generation Y householders were least likely to do so. This pattern was apparent across all five of the thematic areas listed above, meaning that Silent Generation respondents were most likely to save energy and water in the home, purchase environmentally sustainable products, limit waste through recycling and reuse, and limit transport related carbon emissions. The biggest difference was apparent in relation to cleanliness. Younger adults were less willing to compromise on matters of cleanliness and hygiene – and seemed to have different understandings of how often one needs to shower and launder clothes in order to be ‘clean’.

Taken together with the attitudinal findings, our results suggest that Silent Generation householders are undertaking a lot of the work of sustainability, but are not necessarily doing so intentionally. These householders seem to be motivated by broader values of thrift and frugality, and disdain for waste, rather than environmentalism per se. Environmental campaigns that focus purely on promoting pro-environmental actions may be misguided if they overlook the whole host of other values and habits that promote sustainable behaviours – albeit, unintentionally.

The value-action gap
The value-action gap has been widely recognised as a stumbling block for environmental sustainability. People often express pro-environmental attitudes, but do not necessarily put these into practice in everyday life. Our findings showed some interesting patterns in how the value-action gap takes shape across generations. The gap between environmental values and behaviours was almost non-existent for Silent Generation householders, but grew with each subsequent generation. Thus, the gap between expressed concern for the environment, and the willingness to do something about it, seems to be growing. Generation Y householders expressed pro-environmental attitudes at a high frequency, but their behaviours lagged far behind. This has worrying implications for household sustainability in the future.

Implications
Young adults are at a unique point in the life-course; often setting up their own households for the first time. This is an important point in time during which pro-environmental behaviours can become entrenched as part of the fabric of day-to-day life. Alternatively, unsustainable behaviours can become solidified into habits that persist over the life-course. This moment in the life-course should be a focal point of sustainability research and initiatives. At the same time, it is incredibly important that we do not overlook the array of sustainable practices already being undertaken by older householders – even if these are not always undertaken with an explicitly ‘green’ objective in mind.

REFERENCE
Key Messages:

- Environmental values, priorities and practices are shaped by ethnic background, country of birth and religious belief.
- Anglo-Australian and North-west European householders tend to live in larger homes and to possess more material belongings than other groups. North Asian, North African, Middle Eastern and South & Central Asian households have less space per person in their dwelling, and bedrooms are more regularly shared. They also have fewer household appliances and cars.
- Migrants come to Australia with unique bodies of environmental knowledge and a range of environmental skills that need to be better understood in research and policy.

At the 2011 Census, one-quarter of Australia’s population was born overseas and a further 20 per cent of us had at least one parent born overseas (ABS 2012). Our population is also diverse. Australians speak more than 260 languages and identify with more than 270 ancestries (DIAC 2011a). The main source countries of migrants to Australia have shifted enormously over time. In 2010-11, most new migrants to Australia came from New Zealand, China, the UK, India, the Philippines, South Africa, Malaysia, Vietnam, Sri Lanka, South Korea and Ireland (DIAC 2011b). Australia’s religious make-up is also shifting. While Christian religions are still dominant (61% of the population at the last Census), the proportion of residents reporting ‘no religion’ or a non-Christian religion is increasing over time. Buddhism, Islam and Hinduism were the three largest non-Christian religions in 2011 (ABS 2012). Yet most environmental research in Australia has not yet taken this ethno-religious diversity into account (Klocker and Head 2013). Research on household sustainability has positioned Anglo-Australian homes as the norm.

Diverse Cultures, Diverse Households

Environmental values, priorities and practices are shaped by ethnic background, country of birth and religious belief. These beliefs and practices are shaped by migrants’ experiences in their countries of origin, but also shift following settlement in Australia and with each subsequent generation. The composition and size of households, and the ways in which they are managed in day-to-day life, also differ across diverse ethno-religious groups.

With this in mind, a follow-up study to our household sustainability survey was conducted in 2012. The Diverse Cultures, Diverse Households survey was published in seven languages: English, Simplified and Traditional Chinese, Vietnamese, Filipino, Arabic and Hindi. It investigated how everyday sustainability abilities differ amongst households on the basis of attributes such as birthplace, ethnicity and religion. In total, 679 individuals responded to the survey across a broad array of ethnic and religious groups.

Everyday sustainability and ethno-religious diversity

One of the over-arching findings of the Diverse Cultures, Diverse Households study was that Anglo-Australian and North-west European householders tend to live in larger homes and to possess more material belongings than other groups. In these households, it is common for there to be more than one bedroom per person; and for each household member (adult and child) to have their own television and computer. Each adult in Anglo-Australian and North-west European households...
also typically owns their own motor vehicle. Sharing of these everyday items seems rare in these households. But Anglo-Australian households are also most likely to purchase green technologies – like rainwater tanks, home insulation and solar power. While their levels of material consumption are high, they make use of green technologies to reduce their environmental impacts where possible.

The everyday sustainabilities of migrant households (from beyond Europe and the United Kingdom) are less focused on overtly green purchase decisions and behaviours. Instead, environmentally beneficial practices are apparent through lower overall levels of consumption and a less individualised approach to domestic life and household appliances. North Asian, North African, Middle Eastern and South & Central Asian households have less space per person in their dwellings, and bedrooms are more regularly shared. North Asian respondents (mostly from China) are more likely than any other group to live in apartments, they also own the fewest cars and are least dependent on cars for their journey to work. Car use and ownership is highest in Anglo-Australian and North-west European households.

**Sustainability implications**

Migrants come to Australia with unique bodies of environmental knowledge and a range of environmental skills that need to be better understood in research and policy. At the same time, there may also be unique barriers that prevent these households from meeting their full sustainability potential. Given the enormous and growing diversity of the Australian population, and the urgent nature of many contemporary environmental problems, we need to better understand these diverse barriers and opportunities. We also need to think carefully about the pressure put on migrant households to ‘assimilate’ to Anglo-Australian cultural norms and ways of living – particularly when this may mean a shift to less sustainable levels of material consumption over time.

**REFERENCES**


Toole, S., N. Klocker and L. Head (in preparation), ‘Climate change adaptation and mitigation in ethnically diverse households’. 
Food

Key Messages:

- Food and its associated processes produce a complex web of environmental implications.
- Locally sourced food is not necessarily the more sustainable option.
- Cultural norms around food can provide friction against or traction towards more sustainable choices, as the example of kangaroo shows.
- We could reduce the sustainability impacts of wasted food by about 25 per cent if we improved our processes for purchasing and storing food.

There is no more important household task than getting food on the table. Shopping for and preparing meals are complex and relentless tasks in which decisions about cost, convenience, taste and health are juggled. But what about sustainability concerns?

Food and its related processes aren’t commonly thought of as sustainability activities. Our household survey revealed that while many people recycled newspaper and glass (93 per cent) and switched off lights in unoccupied rooms (66 per cent), few avoided eating red meat (10 per cent). Between July 2008 and July the following year, 28 per cent of respondents did report decreased meat consumption, but sustainability concerns were not a motivating factor. Less than one per cent cited ‘the environment’ or ‘climate change’. Instead people highlighted cost, diet and health for eating less meat.

Other sustainability concerns which are often forgotten or simplified include food waste, popular concepts like localism or “food miles” and environmental impacts associated with food production. All of these dilemmas illustrate the complexity and geographical variability in what constitutes food sustainability.

Is humble spaghetti bolognese as simple as it seems?

Spaghetti bolognese is generally thought of as a popular and simple family dish, but when two of the main ingredients (meat and tomatoes) are looked at individually, a range of complexities is revealed.

Meat

Most bolognese sauces use beef mince. In Australia, 11 per cent of greenhouse gas emissions have been attributed to the livestock industry (National Greenhouse Gas Inventory 2009). One of the ways in which Australians have considered addressing this dilemma is through eating kangaroo – they produce less soil erosion (without hooves), and less methane than cattle because of their different digestive tract (Morrison et al. 2007).

All states legalised the commercial sale of kangaroo meat by 1993 and since 2000, kangaroo sausages, fillets and roast have become widely available, including in many supermarkets. Yet kangaroo is not part of most Australian’s weekly practices of food shopping, cooking and eating. Respondents in our household survey reported eating chicken (90 per cent), beef (85 per cent) and lamb (52 per cent) each week, but only eight per cent ate kangaroo weekly. People interviewed by Bryce Appleby said they didn’t eat kangaroo meat regularly because it was ‘bush’, ‘specialty’, ‘restaurant’ or ‘exotic’ food. Some people thought the meat should be used as pet food because many farmers see kangaroos as a pest. Others treasured the animal because
it was a symbol of national identity. Alan, a survey participant, perhaps expressed these views best when he said "I wouldn't eat, for a start, a bloody emu or kangaroo...The bloody national anthem, national icon...Why would you eat them? I think it's wrong. Americans wouldn't saddle up to a bloody big golden eagle, would they?"

Just as getting the family meal on the table involves many considerations other than sustainability ones, so the eating of kangaroo highlights an additional complex of factors (Appleby 2010, Waitt in press). In this case cultural norms around food are inhibiting sustainable choices. In other contexts, for example in religious traditions that advocate vegetarianism, cultural norms may facilitate more sustainable choices.

**Tomatoes**

Kate Roggeveen’s study of tomatoes sold in Sydney’s wholesale fruit and vegetables markets found that on-farm greenhouse gas emissions – mostly associated with greenhouse heating (the dominant mode of production) – were far greater than emissions from fuel used for transport to market, per unit of tomatoes. They also appeared much greater than greenhouse gas emissions at wholesalers or retailers. Tomatoes sourced locally are not necessarily more greenhouse gas efficient, nor are those from small or lower-tech farms. There are other tradeoffs too between water and carbon footprints. Other research by Page et al. (2012) compared field tomatoes with low, medium and high-tech greenhouse production. This research showed that low-tech greenhouse production had the lowest carbon footprint while the field production had the lowest water footprint. The high-tech greenhouse had the highest carbon footprint but a very low water footprint.

**Reasons for eating kangaroo meat**

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<tr>
<td>Low in fat</td>
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<tr>
<td>Taste</td>
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<tr>
<td>Cost</td>
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<tr>
<td>Heart benefits</td>
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<td>Environmentally friendly</td>
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<td>Organic</td>
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<td>Other reasons</td>
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**THE CONNECTED HOUSEHOLD**
Waste

It is estimated that up to a quarter of all food in Australia is wasted, although reliable and consistent data are elusive (Mason et al. 2011). Much of that waste comes in the process of organising (or poorly organising) the purchase and storage of food while juggling other aspects of everyday life. A significant minority of respondents to our survey do not always check what food is in the house before grocery shopping. Refrigerators stretch the period in which we can safely eat food (and leftovers), but also encourage us to buy (and waste) more food. The languishing of food in the fridge is a common experience of food waste. The most important reasons for throwing away food include: ‘past best before date’, ‘leftovers’, ‘mouldy’ and ‘forgot food was there’.

Meals are a key point of ethical juggling within households, and are enmeshed in wider rhythms of work and city life. The humble spaghetti bolognese isn’t as simple as it first seems. The pathways from paddock to shop, and then to plate, are many, and better described as a dense web or network of processes. In Australia most of our sustainability issues are a result of having too much food rather than not enough.

REFERENCES


Waste

Reasons people throw out food

<table>
<thead>
<tr>
<th>Reason</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ate out</td>
<td>200</td>
</tr>
<tr>
<td>Didn’t look nice</td>
<td>300</td>
</tr>
<tr>
<td>Didn’t taste nice</td>
<td>500</td>
</tr>
<tr>
<td>Forgot food was there</td>
<td>700</td>
</tr>
<tr>
<td>Inadequate storage space</td>
<td>800</td>
</tr>
<tr>
<td>Leftovers</td>
<td>900</td>
</tr>
<tr>
<td>Mouldy</td>
<td>700</td>
</tr>
<tr>
<td>Past best before</td>
<td>800</td>
</tr>
<tr>
<td>Spoilt</td>
<td>900</td>
</tr>
</tbody>
</table>

National Greenhouse Gas Inventory (2009), Australia’s National Greenhouse Accounts, Canberra: Department of Climate Change.


CLOTHES & LAUNDRY

Key Messages:

• Before clothing even makes it into a shop, and then the household, there are many upstream sustainability issues.
• Once in the home, clothing has a significant impact on household water use, energy use and waste, mainly through laundry practices.
• Social and moral norms around bodily cleanliness and odour contribute to high frequency laundering.

Clothing is an essential need. It is therefore a central, though far from straightforward household sustainability story. Clothing accounts for between 5 and 26 per cent of total household water use, up to 14 per cent of total household waste, and between 7 and 10 per cent of total ecological footprint, according to methodology and country (Tukker et al. 2006; ACF 2007; Kenway et al. 2008).

When we walk into a shop and buy a new piece of clothing, how often do we think about the upstream sustainability issues involved in getting it there? These issues can include:

• Raw material acquisition
• Energy and water use
• Chemical inputs
• Fuel use in transporting materials and fabrics.

And once clothes are in the home sustainability issues include:

• Water and energy use by people cleaning clothes
• Impacts of detergents used to clean clothes on water and soil systems
• How clothing is disposed, reused or recycled
• Quantity of clothing purchased (Gibson and Stanes 2010).

Fast-fashion

Most people own more clothes than they need and recent trends towards fast-fashion have exacerbated this problem and its associated ecological impacts. Fast-fashion is premised on the rapid cycling of fashions available in shops and at a lower price point for consumers. The upstream sustainability impacts of fast-fashion include higher overall volume of production of clothing, higher transport-related impacts, intensification of fertiliser and pesticide use in fibre production, and increased exploitation of workers.

Laundry practices

Once clothes are in the home more sustainability dilemmas arise as a result of keeping them clean. These dilemmas are often simplified as a choice between washing machine technology and the type of detergents used to clean clothes. But underlying household cleaning practices, like laundry, are many complex social and moral assumptions. Our research gave particular attention to the taken-for-granted cultural assumptions that sustain distinctions between ‘dirty’ or ‘clean’ clothing.

How frequently the washing machine is used:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple times per day</td>
<td>108</td>
</tr>
<tr>
<td>Once per day</td>
<td>161</td>
</tr>
<tr>
<td>Most days</td>
<td>443</td>
</tr>
<tr>
<td>Weekly</td>
<td>653</td>
</tr>
<tr>
<td>Rarely</td>
<td>16</td>
</tr>
<tr>
<td>Never</td>
<td>1</td>
</tr>
<tr>
<td>I don’t own one</td>
<td>16</td>
</tr>
</tbody>
</table>

How do we decide when it’s time to wash clothes?

Deodorising clothes by laundering is crucial to maintaining values of style, feel and self-presentation – less a hygienic than restorative practice. Laundry habits amongst our survey participants were shaped by the practice of wearing separate
layers of clothing, and the distinction between under and outer garments. We found that the decision to wash an item of clothing is often based on whether it came into contact with the skin and/or bodily fluids.

**The ‘sniff test’: smell and the body**

Several people we interviewed spoke about smell as crucial to differentiating between clean and dirty clothes. Some even spoke about the ‘sniff test’, including Zara who said “I crotch smell my jeans and if they smell even slightly, they’re in the wash”. Body odour was also a cause of anxiety for our research participants, because of how sweat-as-stink threatened to upset codes of cleanliness. Respondents routinely used the emotional terms ‘embarrassed’ and ‘uncomfortable’ when they understood the smell of their clothes to violate social norms. One participant, Jenny, said smelling body odour was considered “insulting and inconsiderate”. Laundry practices are shaped by assumptions about dirt, smell and morality (Waitt in press). And a possible implication of these assumptions is that people will have a large enough wardrobe to wear freshly laundered clothes on a daily basis.

**The sustainability complexities of washing and drying clothes**

Washing and drying consumes a large percentage of total energy for the life-cycle of clothing. Changes in washing practices (with the invention of the electric washing machine) mean clothes are washed more frequently than they once were and wear out more quickly. This exacerbates overall resource use and carbon emission impacts, and indirectly (through wearing-out of clothing) heightens dependence on the fast-fashion system.

As knowledge spreads of the water and energy use impacts of warm washing and using electric clothes dryers, government initiatives have encouraged manufacturers to recommend cold washes and line drying on care labels. Such efforts can be counteracted by other impediments like bans on outside line drying in some apartment blocks. Other efforts include the shift towards second-hand clothing consumption, from charity shops to dedicated commercial vintage stores. However, not everyone is comfortable wearing second-hand clothes. There are also generational dimensions to consider – Generation Y often have different perspectives on clothing consumption (purchasing more clothing than they need) than those who grew up through the depression and war years. And some people are simply constrained by circumstances, with frugality concomitant with necessity.

**Is buying less clothing the answer?**

Buying fewer clothes is the single most significant sustainability improvement we can make. We can also buy quality clothing that lasts, wash clothes less often, on low temperatures and dry on a line, and choose styles that are classic and therefore less likely to date.

More gradual cultural change is needed too. Working against reducing consumption of water and energy resources are powerful sensual and emotive norms. People are judged by how they smell in their everyday interactions with others and keeping clothes clean is integral to maintaining the image of a ‘good’ homemaker, but also a ‘responsible’ citizen, by not smelling of body odour. Such notions increasingly collide with the imperative to become a ‘responsible’ citizen by reducing energy and water consumption.

**REFERENCES**


Waitt, G (in press) Bodies that sweat: the affective responses of young women in Wollongong, New South Wales, Australia. Gender, Place and Culture.
KEY MESSAGES:

• The toilet is one of the biggest water users in the household.
• Changes in sanitation behaviour are unlikely to have a significant effect on water use until there are cultural shifts in taboos surrounding waste.
• Close encounters with other people’s excrement are currently only contemplated in intimate relationships.

When it comes to excrement most of us like to flush and forget. But a closer look at toilets reveals deeper dilemmas associated with sanitation systems.

There have been various developments in flush toilet and hand basin technology to both save water and maintain or improve existing standards of cleanliness. These new technologies are often accompanied by expectations of bathroom behaviour change. But our research showed that changes in sanitation behaviour are unlikely to have a significant effect on water use until there are cultural shifts in taboos surrounding proximity to waste and perceived needs for large quantities of water to flush all signs of it away immediately.

Many of the households we spoke to subscribed to ideas about water conservation, yet these sanitation taboos were still strong in their everyday practice. Refraining from flushing immediately after defecation was never contemplated and refraining from flushing after urination was not favoured.

Loretta, who lives with her husband and four teenage sons, said “I do flush [after each use] and someone in our house doesn’t and I don’t know who it is but it’s very annoying. And I know you’re supposed to flush after every second or third go but I just like them to flush, especially when there are girls in the house because the smell builds up and I don’t like it”.

Other households had employed water efficient technologies but not necessarily to save water. Marie for instance, was satisfied with a potable low-water flush for each use rather than a high-water flush every few uses, because the toilets in her home had dual flush mechanisms.

A different approach

Avowedly proud homemakers, Elizabeth and Gerry, had a distinctly different approach to negotiating the tension between cleanliness and reduced water use in the bathroom. With two toilets in their home, they maintained the main bathroom to guest standards, which involved a flush for each use. But they rarely used the guest bathroom themselves and had different practices in the toilet they used in their en-suite. Here they followed the mantra of “when it’s yellow let it mellow, when it’s brown flush it down”. They also co-ordinated toilet visits by using the toilet consecutively and therefore flushing only for both. If they discussed their needs to visit the toilet, and tolerated brief visual and olfactory encounters with each other’s waste, they could achieve significant water savings as well as relatively quick separation from their bodily waste. They combined these efforts with other water-saving techniques and reported their water bills indicated water consumption equivalent to one person or less. Elizabeth and Gerry had started, in a small way, to re-evaluate both their relationship with excrement, and the resource intensity that currently characterised its disposal. Finding ways to achieve both cleanliness and water reduction in the home, they confronted and altered the disgust felt towards their own and their partner’s waste.

The flushing toilet has arguably been the most successful system for eliminating human waste from our private lives. But it’s also one of the biggest water users in the household – with research finding that some 20-25 per cent of indoor residential water use in Australia is due to toilet flushing (Schlunke et al. 2008). Infrastructural commitments to water-based systems are hard to change, as are sanitation practices. Addressing issues of disgust toward human waste, as Elizabeth and Gerry had done in their small way, is likely to be a central first step to systemic changes to sanitation systems.

The household is a useful site where disgust with excrement can begin to be confronted, starting with the least disgusting excrement of self and family members. Combined with water saving practices, this confrontation could begin the long, necessary process of shifting to sustainable sanitation.

REFERENCE

Rainwater Tanks

Key Messages:

- Water restrictions were as effective as rainwater tanks in reducing mains water consumption during the Millennium Drought.
- Households with rainwater tanks are not more likely than others to undertake water saving practices inside the house, and include both ‘water savers’ and ‘water users’.
- Rainwater tanks do not achieve water savings in and of themselves, but rather become entangled with social practices and bundles of meaning that can both increase and decrease water consumption.

The combination of climate change, population growth and increasing affluence is putting pressure on water resources. In Australia unprecedented droughts have brought water issues strongly into public consciousness. Many households have turned to domestic solutions like dual flush toilets, low flow shower heads, rainwater tanks and front loading washing machines to save water. But as one of our interrelated studies revealed, no technological solution provides a straightforward fix.

Rainwater tanks are a prime example. After a number of decades of prohibition in urban areas, water tanks were rehabilitated during the Millennium Drought (2002-2009). They were heavily promoted and subsidised, and enthusiastically adopted.

Do rainwater tank households use less water?

Candice Moy’s analysis of water tanks in the Illawarra region of New South Wales compared the mains water consumption of over 7,000 households who installed a tank during the drought (for two years before and two years after installation) with that of total household mains water use under a regime of water restrictions. Both populations showed about the same amount of reduction – 10.26 per cent for tank households and 10.8 per cent for the wider community. It was a puzzling finding as the policy view and the natural expectation is that, even when only fitted with outdoor connections, as most are, domestic tanks are a logical way to reduce the consumption of mains water, 28 per cent of which is assumed by Sydney Water to be used outdoors.

Behaviours, practices and attitudes

In the survey of 1,465 Illawarra households, 426 reported having a rainwater tank. These households were more likely to have solar power, compost, use grey water, and regularly grow their own fruit and vegetables. Contrary to this engagement in pro-environmental behaviours, this group was also more likely to own four-wheel drives, clothes dryers, dishwashers, computers, separate freezers, air conditioning and heaters. The results showed no statistical difference in the way household water was used. Tank households were not more likely than others to undertake water saving practices inside the house (like turning off the taps while cleaning teeth, only washing clothes with a full load, avoiding the tap running while washing dishes, reducing the length or number of showers or reducing toilet flushes). We found that water tanks could provide a badge of green identity in high-consumption households without necessarily changing practices.
Tank households – water savers or water users?

Interviews and ethnographic study with a sub-sample of households in Candice’s water tank analysis identified two distinct sets of practices – water savers and water users.

**Water savers**

The water savers cohered around practices of frugality. They consciously limited their water use, and recycled mains water whenever possible. Many in this group had spent their childhood or a significant period of time in rural areas where mains water was not available. The water practices that emerged during this time were maintained in their Illawarra residence despite readily available mains water.

**Water users**

A culture of high water use was evident for many rainwater tank owners. Analyses revealed continuous engagement with leisure based water use, for activities such as lawn maintenance, gardening, pools, and cleaning regularly required large volumes of water. These activities were seen as essential, as well as enjoyable, parts of their households’ culture and everyday practices. Many of these activities were strictly limited or prohibited by the introduction of water restrictions in 2003 (as a result of prolonged drought and falling dam levels). These households were forced to curb their outdoor water practices. For many rainwater tank owners, this imposed limitation had prompted the installation of their tank as a way to overcome the restrictions. This direct response to restrictions on outdoor water use is supported by the representation of households that have a connection for outdoor use only. Of the 7,125 Illawarra households that applied for a rebate during 2005-2007, 90 per cent recorded no indoor connections.

Ivan said he didn’t see “any point” in indoor connections because "...you’re not restricted to the use on a washing machine. You were on your garden”.

Some water users were also vocal in the importance of autonomy and freedom from government restrictions in their reasons to install a tank. One water user said “It’s just the freedom that if I want to hose the concrete, I’m allowed” and another commented that "I can do what I want to do. I’m not governed by government rules”.

**Conceptualising water**

We also found that water was conceptualised differently by rainwater tank owners, depending on its source. Mains water and tank water had different associated meanings, quality and subsequently, different household purposes. Many people revealed they thought tank water was of a lesser quality to mains water and wasn’t suitable for use inside the house.

**What to do?**

Dilemmas surrounding water resources are complex. There are many technological solutions but none provide an easy fix. In the example of rainwater tanks we found they do not achieve water savings in and of themselves, but rather become entangled with social practices and bundles of meaning that can increase and decrease water consumption. Even the ‘no-tech’ tool of stringent water restrictions – apparently quite effective in driving behavioural change – requires a technological regime of public education and compliance to hold it in place. Installing a rainwater tank will not reduce pressure on mains water if the cultural legacy of excessive water consumption, based on enduring conceptions of endless supply, is not addressed.

REFERENCES

Water heating is responsible for the largest proportion of carbon emissions in the average Australian household and accounts for about 25 per cent of household energy use (DCCEE 2012). Solar systems therefore offer high potential energy savings. Many government incentives like rebates and certificate programs have been put in place to make the purchase of solar hot water systems more affordable.

There are a variety of solar hot water systems available on the market, with most falling into one of two categories – storage and instantaneous systems. Solar systems can’t always supply all household water demands and are usually fitted with gas or electric boosters which heat water.

Choosing a solar hot water system should be relatively straightforward but low rates of installation in some jurisdictions in Australia suggest the decision may not be so simple.

Information and uncertainty

Our research interviews revealed positive stories about solar hot water but also reflected uncertainty. One relatively content solar system owner experienced problems making sense of information and described a sense of unease that he may be getting an inferior product that he had no way of validating. He said “There was information but…you just never know how true it is…”.

There is a lot of information that aims to encourage homeowners to install solar systems, but households have to do the hard work of figuring it all out and it’s at this point that the process can stop. Those who do persist will then often run into issues of trust. One homeowner said “the first guy didn’t know what he was talking about, really. I probably knew more, and I thought, you’re really trained in selling this based on the rebate, and you are a salesperson…”

How well do solar hot water systems meet their intended purpose?

The Australian federal government advises that solar hot water systems can provide between 50 and 90 per cent of water heating needs. However, our study of solar hot water systems found that if solar systems were poorly installed the contribution from solar could be minimal. Households with electric boosted systems had highly variable (by as much as a factor of 20) off-peak electricity consumption per person, a variation not easily explained by other aspects of the household. Key variables include:

- Installation (configuration of the booster and when it is set to turn on)
- Inadequate system capacity relative to household size
- High temperature settings
Lack of advice to households regarding use strategies and
• A lack of pipe insulation.

Household factors include:
• Poor timing of hot water use such that the booster is used excessively
• Uncertainty as to how to run the system to maximum effect.

One simple issue was a lack of understanding of how the system operated. One participant said “Experimenting and then finding we don’t have hot water in the morning is a pain in the butt” and “...we’ve lost interest in it. We didn’t know what it was actually doing [the booster], we didn’t want to not have the hot water”.

Other households felt their solar hot water system had forced them to compromise on other sustainability objectives, particularly water efficiency, with an increase in water consumption raised by half the participants. One person said “the only thing I find different and I’m not sure if it’s got anything to do with the solar system, was...how long it takes to get hot water out of the tap”. And some households, despite early attempts at modifying their use or controlling the operation of the system, had simply given up on any efforts to manage the system proactively.

The decision to install a solar hot water system is not straightforward. Systems have the potential to save on energy use and greenhouse gas emissions if they are installed and used correctly but financial benefits for individual households are less clear. Installation is more likely to be a non-financial decision that’s driven by environmental concerns. However uncertainties and hesitation are often barriers to installation.

The role of installers
Household sustainability is as much about the relationships outside the household as about the action and nature of the household – so the role of installers as gatekeepers is critical. Households need access to better information without recourse to installers. And beyond issues of trust, many of our interviewees received varying information and assistance with their hot water systems. While some were willing to experiment, others were quickly discouraged - often because they lacked basic information about how the system worked and not all had switches for the booster installed, limiting their control. Other issues include the quality of installations and pipe insulation.

It’s also worth mentioning the likely development of ‘smart’ controllers that have potential to manage booster operation in more nuanced ways. They will potentially adjust booster use according to weather and water use patterns, not just on the basis of temperature which could encourage households to engage more with their hot water heater.

REFERENCES
Gill, N., P. Osman, L. Head, G. Waitt, C. Gibson and M. Voyer, (in preparation) ‘I have a PhD: I should be able to do these things: solar hot water systems and the connected household’.
USEFULNESS
OF THINGS

Key Messages:
• A lot of furniture is stored in households for re-use or gifting in different life cycle transitions.
• Mattresses are one of the most rapidly replaced items of furniture because of anxieties about dirt and odour; they create particular disposal issues.
• We don’t like to throw things out that work, like second fridges, even when we know they’re bad for the environment.

Number of fridges in household:

<table>
<thead>
<tr>
<th>Number of Fridge</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>769</td>
</tr>
<tr>
<td>Two</td>
<td>542</td>
</tr>
<tr>
<td>Three</td>
<td>87</td>
</tr>
<tr>
<td>Four</td>
<td>10</td>
</tr>
<tr>
<td>Five or more</td>
<td>4</td>
</tr>
</tbody>
</table>

Beds, televisions, fridges, phones, computers, tables, drawers, chairs, books, clothes... Our homes are full of things, many of which have emotional meanings attached. We cram lots of things into our homes, often without giving much thought to their journey from raw materials to production, distribution and home consumption. Our research of Australian households revealed several sustainability dilemmas when we took a closer look at what’s inside the home. Do we really need so much stuff? How useful is the old furniture taking up room in the garage? Will we ever really use those old phones hiding in drawers at home? And is the classic Australian beer fridge really a necessity?

Furniture

Unlike household appliances which can be measured for energy or water use, there is limited data on the contribution of furniture to sustainability problems. The average middle class home is usually made up of multiple beds, tables, wardrobes, couches, desks, drawers, chairs, cabinets and many other miscellaneous extras. And you can’t forget the many garages full of more furniture waiting to be used again or passed on to children when they move out of home. But is stockpiling just delaying the inevitable? Do most of these things just end up getting discarded anyway?

Our ethnographic research showed that sustainability issues for furniture depend on household practices. People often don’t like throwing furniture out and hold on to it for possible reuse. Furniture gifting and reuse can also mark life stages – like when children move out of home and inherit their parents’ furniture. Participants in our study also revealed emotional attachments to old furniture that was passed down from recently deceased relatives and they often found these items hard to discard.

The popularity of stores like IKEA also shows there is a growing trend of furniture being incorporated into the replacement/fashion-cycle logic. But our ethnographic work still found quality was a consistent factor driving furniture purchasing among environmentally-committed households. As research participant, George, said “…we don’t throw stuff out because the fashion changes. There’s got to be a good reason for it. And we don’t throw stuff out because we might get to a house one day and there might be that extra room”.

The hidden furniture dilemma: mattresses

Mattresses – a key source of anxiety about dirt and odour, even with new materials and technologies – are one of the most rapidly replaced items of everyday household furniture. Almost universally, the Western norm is now towards buying mattresses new rather than second-hand. Landfill remains the
most widespread disposal practice for this item. Nevertheless, some 85 per cent of the materials pulled from mattresses are salvageable for recycling, including reclaimed steel, cotton fibre, polyurethane foam and wood. But our ethnographic research also suggests that knowledge about how and where they can be recycled is poor. Bigger questions also need to be asked about how to resolve the deep contradictions between an aware market segment who exercise choice and care over purchasing and recycling decisions (yet who replace mattresses more frequently) and an apathetic segment that make their mattresses last longer, but who do not recycle, and are unwilling to pay more for better made, lower footprint items.

The refrigerator and beer fridges
The refrigerator or “fridge” is commonly regarded as a necessity rather than a luxury item. And like many other household items it’s one we often only think about when it breaks down and needs replacement. But there are many sustainability issues arising from the 24/7 cooling of food, including the contribution this makes to greenhouse gas emissions. In addition to this the fridge also animates the landscape of household sustainability in many ways, including what we eat, our shopping patterns and how much food we buy. Our research found that one of the most frequent satisfactions of refrigeration was the practice of food provisioning and bulk buying, shopping weekly and not daily. In a world of perceived food abundance, the fridge was a strategic weapon against price and for managing time. For many bulk buying is a way to sustain ‘normal’ family life. Emily is a working mother of five and said “I buy milk in bulk. Probably 12 litres at a time and just put it in the fridge. It save me having to every day go to the shop”.

And what about second fridges? While a 2008 survey in Australia suggested householders ranked energy star ratings of fridges as more important than price or brand (ABS 2008a) many of us are reluctant to throw out old working fridges, despite their sustainability impacts. One third of Australian households have two or more fridges in use (ABS 2008b). When Arnold and Anne replaced their fridge without hesitation during a kitchen redesign, they chose to keep the old fridge in the garage for entertaining purposes. Arnold said people love his beer fridge and Anne explained “It’s very hard to sort of dispose of something when it still works. So we do use them both...”.

Mobile phones
Most of us have a spare phone or two in a drawer at home. And like televisions and computers high levels of phone replacement drive manufacturing and purchasing of new phones. Most people replace their mobile phone every couple of years, despite old ones often still working. The experience of Marie, an ethnography participant, was typical: “I was on a $29 plan and they just rang me up and they said we can upgrade you to this newer phone and it’s got this brilliant 10 megapixel camera... That’s even better than our digital camera. I thought, OK, yeah, I’ll have it”.

The default action for most of us once we get a new mobile phone is to put the old one in a drawer and leave it there. In Australia around 40 per cent of people have two or more phones stored at home, with an estimated 19 million phones being stored in Australian homes in 2011 (AMTA 2011). Stockpiling occurs because throwing the small devices in drawers and forgetting about them is easy; because phones increasingly contain data that people are concerned about and they may be unsure as to how to ensure data removal; and because people want a spare or backup phone for themselves, or to lend to friends or visitors. Some people we interviewed used two mobile phones – one for work and one for personal use. In this way they were used as a device to mediate boundaries between private and work identities.

Our homes are full of things – each with their own sustainability complexities.

REFERENCES
EXTENDED FAMILIES AND SHARING

Key Messages:

• Extended family living has the potential to reduce resource use and improve sustainability outcomes through the sharing and pooling of household spaces and material goods.
• More people living under one roof can help to limit suburban sprawl.
• Extended family households have a range of strategies for maintaining privacy, space and independence, despite living under one roof.

The family, as we know it, is changing. While the nuclear family remains the most common type in Australia, research shows there are signs of a shift (back) to extended family living. As the prevalence of these households grows, so does the potential for improved sustainability outcomes.

The average Australian household is made up of 2.6 people (ABS, 2011). The extended family households visited by Erin Borger contained an average of 4.3 people. These homes included adult children returning to the parental home (with or without their spouse and own children) and elderly parents living with an adult child (Klocker et al. 2012).

Living together and the environment

Environmental sustainability was neither a motive, nor volunteered by participants in our study as a positive outcome of their living arrangements. Instead they cited financial benefits and opportunities to build supportive familial relationships. Some families who participated in our survey lived in the same house but, in a practical sense, were living apart. These families had self-contained areas and lived quite independently. We refer to them as ‘living together but apart’. Other families lived together in a more complete sense, sharing communal household spaces. We refer to them as ‘living together’.

Our research revealed many environmental benefits of extended families living under one roof. As survey participant Gabrielle recognised: ‘...if you’re running your own whole house, it’s a lot less sustainable than living in part of someone else’s house. And we’ll quite often do stuff together. If mum was in a house on her own, she would quite often take her car to go to the beach...whereas we go together now. Even your garden, if you were looking after your [own] garden you would be watering that...we just have the one garden’. Gabrielle also mentioned other sustainability benefits of this style of living in relation to heating, electricity, lights and washing clothes. For her, extended family living “just seems intuitive”.

Through our findings it became clear that extended family households can reap some benefits without even attempting to be “green”. Even in cases where extended family households lived together but apart, actively heating or cooling one part of the house passively heated or cooled another. Beyond the energy savings of fewer dwellings, having only one garden presented water savings and fuel was saved when familial care and sociability occurred without using the car.

However, sustainability complexities do arise in some extended family households. Cultural values of privacy, space, and independence – and the sanctity of the nuclear family – have led to the duplication (and sometimes multiplication) of spaces, appliances and resources.
Valuing space

Personal space was significant for all households and at times was a source of frustration. One of our participants, Nathan, said his parents “Have a comment for everything” but he and his wife were able to “bite their tongues”. Michael thought extended family living would be ideal if it weren’t for privacy infringements. He also described the “…continual battles you have with your parents because they always know the “best” ways”. The results of our study showed that conflict minimisation, privacy, and independence were key values fulfilled by the adequacy of available personal space. All households employed different strategies to maintain these values and many of these strategies had implications for household sustainability.

The kitchen

For Marion separate kitchens maintained harmony. She said “…there’s that old Chinese proverb ‘two women living under the same roof is disharmony… separate the kitchens… then you’re right”. The replication (rather than sharing) of material objects like stoves and fridges has immediate implications for energy consumption. Households that had separate kitchens usually shopped, cooked and ate separately. But those households with a shared kitchen often shopped and cooked for the whole group. By shopping and cooking for the entire household, families likely saved on transport costs and fuel consumption. And regardless of how households shopped and cooked we found that food waste was still reduced because leftovers were shared across all types of living arrangements. Extended families also tended to share small kitchen appliances and some ingredients. These small acts of sharing cumulatively contribute to reduced material consumption.

Bathrooms, laundries and washing

Across all households laundry rooms and washing machines were shared. Households that lived together usually washed all members’ clothing together; whilst the other households who lived together but apart generally ran separate washes with the same machine. Shared laundry practices in households that lived together were a notable sustainability benefit.

Non-negotiable – the bedroom and television

Our research revealed that while some households were happy to share living spaces, things weren’t so flexible when it came to bedrooms and televisions. Most households had one bedroom per household member (including children) and there was an average of one television per adult. Televisions were spread across living spaces, kitchens and bedrooms and they functioned as a retreat from ‘crowded’ communal spaces and allowed people to maintain privacy.

As one of our participants, Michael, said “I think that is a crucial thing when it comes to your personal space, is having that thing you can watch where you can switch your mind off from everything that’s happening”. Our research found the television to be much more than a source of entertainment – it fulfilled deeply held cultural values for both privacy and family bonding, which trumped the economic and energy savings made possible by purchasing and viewing fewer televisions.

Sharing ‘stuff’

While people didn’t like sharing televisions there were other objects which were reused or shared, like bookcases, shelves and tables. Householders also shared clothing, books and DVDs. Leanne stopped buying clothes regularly and started sharing her daughter’s. She said “I’ll come and try Jodi’s on and then I’ll go back to the shop after that if I can’t find anything”. Reuse and sharing of objects implies that fewer purchases are being made, reducing waste and overall consumption.

Cars, independence and caring

Cars were rarely shared, with approximately one car per adult. Marion said “It is too impossible to share cars. Even just sitting down and thinking about how you would work it out. I just can’t see it happening”. The value placed on independent and flexible movement was at the forefront of decisions to own and use multiple cars and overrode potential economic savings and environmental benefits that could have flowed from sharing cars and splitting costs across household members.

Our research suggests that the mode of extended family living adopted influences domestic management of material spaces, objects and activities – but in complex ways. In light of climate change and broader agendas to limit the impact of human settlements on the environment, strategies for increasing household size and communal living should be considered. Larger household sizes have clear sustainability benefits. Extended family living also reduces pressure on an undersupplied housing market and minimises (sub)urban sprawl.

Following current trends in living arrangements, the number of households in Australia will grow from 7.8 million in 2006 to 11.4 million in 2031 (ABS, 2010). Any chance of mitigating the cumulative environmental impacts of this, in terms of both carbon emissions and loss of habitat, will have to factor in the possibility of larger household sizes.

REFERENCES


More people now than ever are driving cars from place to place, despite often acknowledging the contributions their vehicles are making to greenhouse gas emissions. In 2010 the number of registered passenger cars in the world topped one billion, increasing from 500 million in 1986 (Ward’s Automotive Group 2011).

In Australia, government policy has focused on engineering and educational solutions in an attempt to lower greenhouse gas emissions from cars, but an ethnographic study we undertook reveals that stronger cultural approaches are needed. Theresa Harada’s study of 40 car drivers in the affluent Sydney suburb of Burraneer Bay found that 82 per cent were concerned about climate change, 79 per cent had a clear understanding of climate change and 72 per cent were willing to change their behaviour to lower carbon emissions. But in reality only four of these drivers had actually decreased their driving over the previous 12 months (Waitt and Harada 2012, Harada and Waitt 2012).

**Car cultures**

Cars meet very different (perceived or actual) needs. Many decisions drivers make are economic, like buying petrol, insurance, makes and models. However the values supporting and shaping the decision to drive a car are usually cultural because preferences and behaviours stem from cultural norms, habits, tacit knowledge and passions.

Phil, a general manager in his 40s, said he could get around in “...a Honda Jazz or something similar” but he prefers his “...two tonner vehicle [BMW] that burns up a lot of fuel”. This is despite admitting “I am well aware of the whole impact of greenhouse gases and everything else...we are recycling waste and doing everything we can to reduce our impact on the environment”.

**Keeping up with the Joneses**

Our research also revealed cars are often a means to cultural capital, as 19 year old student Lucy explained “We’ve got big cars here. Around here people tend to keep up with the Joneses... At the moment four-wheel drives are popular, but if hybrid cars became popular then people would drive them”. The seemingly rational choice of driving a less polluting car is trumped by the pleasures and social status of driving a particular model and brand of car.

Jim, a retired manager in his 60s, understood the car as a basic necessity and said “I suppose the car for me is just a necessary mode of transport. You just think about it as one of the necessities of life. I know people use public transport, but you wouldn’t want to live out here if you wanted public transport”. We also found that everyday mobility choices are a mechanism of indi-
individual and social differentiation. Driving a private car helps us get from A to B when doing everyday mundane tasks, but also allows us to sustain a sense of self.

Rhythms of driving and time
Our research also showed rhythms of car mobility intersected with beliefs about freedom, safety, convenience and efficiency. Phil told us that “Public transport would not get me to where I need to go during the day; within the timeframes I need to operate...” and Harry, a retired engineer in his 60s said “For someone my age [using public transport] would be a ridiculous hardship”. Cars are seen to maximise use of clock-time, getting us where we want to go and facilitating personal rhythms of movement. Most people see the car as flexible, eliminating the need to become part of a mobile public constrained by tickets, collective scheduling, connections and timetables.

The car and sensual appreciation
Several of the participants in our survey spoke of the importance of bodily sensations of driving comfort. Phil described test driving a hybrid Lexus as “boring” and said he “...felt completely disconnected from the driving experience” because it was too “smooth”. He can “feel the road a little bit more” in his BMW because it has sports suspension. Patrick, in his 60s, said “...you feel slightly unsafe on the train... Driving your own car you feel safe and comfortable”. Our survey results indicated that people saw driving as a way to be sheltered from intrusive smells, temperature and sounds beyond the car, enveloped in the illusion of safety.

Cars and the ‘good life’
Car culture sustains the ‘good life’ and despite driving being an unsustainable practice, encouraging people not to purchase a car or to drive less is far from convincing. For those who can afford it, the car remains an expression of individual status, style and emotional attachment. The household sustainability dilemmas of car-driving therefore evoke questions about the roles of personal transport choices, government regulation and car manufacturers. Our research shows that relationships with cars are complex and, when it comes to driving, a range of cultural norms, habits and passions are at play. None more so than cultural norms of time – we expect seamless time in the way we juggle our days. And it is likely these perceptions of time will prove very difficult to budge.

REFERENCES
Key Messages:

- Being green takes time, and different types of time, like block time, thinking time and habitual time.
- If households want to become more sustainable we need to change our experience of time, but this cannot happen in isolation from wider social practices such as work patterns.
- Exploring the concept of time helps understand how change occurs – how old practices become deroutinised and new routines embedded.

Vanessa Organo compared time diaries of different Illawarra households with ABS statistics, and found that it often takes a bit more household time to undertake sustainability practices like recycling, composting and catching public transport. But if we really want to change household routines, it’s not the total time needed that’s most important, rather the different types of time we need to focus on.

Block time
This is the investment needed for large projects, like building chicken coops or establishing vegetable gardens.

Head space or thinking time
Several of our research participants spoke about the importance of head space or ‘thinking time’, to formulate new ideas and process them. Taking the time to change habits can be related to the pace at which households live. When people decide to research sustainable options – for example in house renovations or major purchases – it can take a lot of this sort of time.

Habitual time
These are the fragments of time required to embed new practices into everyday routines and rhythms. In a video diary of one research participant, Rowena, she can be seen walking around her house at 10:45pm one night switching off lights in every room because it’s “one of those jobs that needs doing”. She says she does it “throughout the whole day – those lights just keep coming back on” and it “drives her demented”. And her tone of voice suggests following through on her family’s unsustainable habits is clearly a repetitive and somewhat monotonous chore.

Combinations of time
Darren and Megan’s household showed how putting certain sustainability practices into action can require a combination of block and fragmented time. Once the children are in bed Darren has leisure time in the evening. He uses these blocks of time to experiment, plan and construct things with regards to sustainability, as a form of pastime. In contrast, Megan’s time is fragmented, balancing sustainability practices with a diversity of household responsibilities.

Darren even makes home-made laundry detergent, using biodegradable ingredients he bought in bulk. He explained that “[Megan] would shop for an eco-version of laundry detergent. I found the idea [of home-made laundry detergent] and she wasn’t sure”. The first batch worked well and Darren said Megan has “taken over making it”. This example highlights how the outcomes of Darren’s time spent experimenting are
transferred into the household routine as it becomes habit, and consequently becomes Megan’s responsibility.

Darren and Megan’s situation also shows why patterns of household sustainability are heavily gendered. Women, especially mothers, whose domestic work patterns are ‘always on’, tend to experience time as continuous, fragmented and interruptible. They more frequently bear responsibility for managing everyone’s time, whereas men’s domestic work tends to be project oriented and usually experienced as leisure.

**Seamless time**

As mentioned earlier in our report, another area where time emerges as an issue is transport. Car mobility has created an expectation that time should be seamless and that we can combine many spatially separated activities into our day. Even in heavily congested traffic, car journeys are anticipated by many participants as instantaneous, economical, smooth and seamless. Public transport, on the other hand, is often thought of as creating friction and disruption in an otherwise flowing day. Lucy, a 20 year old student explained in our interviews, “I have missed trains by minutes and have to wait half an hour for the next one, and that really frustrates me because when you have a car you can go when you want to. You are not stuck to timetables”.

**‘Things’ and time**

There are many items that can be found within the home which also act as devices through which we manage our time and days. Examples include the refrigerator and mobile phone. The refrigerator, mentioned earlier in this report, allows people to manage their time by enabling them to buy in bulk and store food for longer. Gone are the days when daily trips to the shops were required, we can now do weekly or even fortnightly shops. The refrigerator allows us to sustain a ‘normal’ family life and allows us to maximise our use of time. The mobile phone is another device that helps us manage our time. The growing popularity of smartphones means we’re not only able to stay connected to people, but we can organise our social life, work out the fastest transport routes by monitoring traffic updates, read the news, send emails and keep on top of our calendar – all in palm of our hand. This ‘micro-coordination’ (Ling and Bashir 2011) of many aspects of daily life for families, friends, and businesses helps us function within society and, like refrigerators, maximise our use of time.

Time emerged as an important issue in many of our sub-projects. If households want to become more sustainable we need to change our experience of time. Block time is crucial to the research and implementation phase and allows households to reflect on their practices, make decisions to change, research options and incorporate them. And habitual time – repetitive activities incorporated into everyday routines – is crucial to the ongoing success of any changes instituted.

**REFERENCES**


DILEMMAS

Our research could not cover every sustainability dilemma faced by households in the course of everyday life. It's not so easy being green. There are many more perplexing dilemmas of household sustainability that could be discussed. Some are irresolvable, some require the disentangling of cultural practices from wider structural imperatives and others require behavioural change to work in tandem with regulation. Here is a snapshot of just a few of these additional dilemmas, which are discussed in more detail in our book *Household Sustainability. Challenges and Dilemmas in Everyday Life.*

The great nappy debate

Nowhere are the sustainability dilemmas of parenting as problematic as with nappies. Figures vary, but on average before toilet training an average baby uses 6,000 nappies, produces 91kg of faeces and 458kg of urine. Every day in Australia 2.2 million nappies are used (Treehugger.com). Non-biodegradable disposable nappies take an estimated 200-500 years to break down, and are according to some reports the single biggest category of item dumped in landfill. These figures alone make reusable cloth nappies the obvious sustainable alternative. But it’s not that simple.

An early and much cited Canadian study, financed by Procter and Gamble, modelled consumption of energy, raw materials and water, atmospheric emissions and wastes, and found that cloth nappies consumed more water and produced more waterborne wastes, whereas disposable nappies consumed more raw materials and produced more solid wastes. In the researchers’ words, ‘neither diaper system can be considered absolutely superior environmentally’ (Vizcarra et al. 1994).

There are many other factors that need to be taken into consideration and which add more complexity to this debate. Are cloth nappies recycled as rags or disposed of as landfill? Are they washed at home or laundered professionally? At which temperature are they washed? Are they pre-soaked? Results will vary enormously on whether a top or front loading washing machine is used and whether cloth nappies are line-dried or dried in an electric drier. Other factors that need to be taken into account include how nappy materials are sourced and produced, as well as runoff issues associated with the production of raw materials to make them. Another alternative is to toilet train toddlers much earlier, as in most of the less affluent world, but this is often conflicts with busy families juggling time and child care, as well as sanitary norms. Whatever the actual merits of the types of nappies used, there is no doubt that it has become an emotive issue with no easy answer.

Plastic bags

A variety of measures have been adopted to reduce production and usage of plastic bags. These include bans or levies and reusable bags – commonly referred to as ‘green bags’. In one of our surveys 62 per cent of respondents said they “always” or “usually” take their own bags shopping. But most of us are guilty of leaving our green bags at home or in the car, or popping into the shop for one or two items and ending up in possession of a plastic bag. So how do single use plastic bags compare with other options? A study undertaken by Helen Lewis, Karli Verghese and colleagues at RMIT University compared the bags that would be needed for a household to carry 70 grocery items home each week for 52 weeks. The researchers found that reusable green bags had lower environmental impacts than all single-use bags. But this outcome is highly sensitive to the number of times the bags are used. Because of the greater amount of embedded energy and materials used in their production, green bags have to be used more than 50 times for this benefit to be realised. In fact, if a green bag is only used 52 times (weekly for a year) instead of the assumed 104
times (weekly for two years) then its impact on global warming is higher than the impact of each single-use bag (except paper bags). Green bags don’t provide any benefit sitting in the boot of a car or in a kitchen cupboard.

Flying
A host of sustainability issues accompanies flying – noise, air and water pollution, in-flight waste, fuel use and greenhouse gas emissions – just to name a few. For households, one flight can counter any other efforts to be more sustainable. Wright et al. (2009) describe an Australian commuter who saved 3,000 kilograms of carbon dioxide per year by riding a bike 10 kilometres to work instead of driving. According to the Qantas offset calculator (Qantas 2012), if he took one return flight from Sydney to Los Angeles his emissions would be 3,362 kilograms of carbon dioxide. If he flew premium economy, business or first class it would be even higher.

Air travel would seem a likely target for reduction if households want to live more sustainably. Yet people fly for a wide range of (to them) perfectly good reasons like facilitating business and family relationships. And research has found that environmental concerns about air travel alone will not curb demand. Air travellers aware of the impact of flying express ‘sentiments of guilt, suppression and denial of air travel’s climate impact’ (Cohen et al. 2011, 1085). While our research and ethnographic data revealed uneven patterns of propensity to fly, the question we need to consider is to what extent is unconstrained mobility a feasible goal for society? Many social and cultural issues are keeping people in the air and flying for work, leisure or family. It is likely that people will keep flying despite environmental concerns, governments are unlikely to take action to curb flying (they are more likely to encourage it) and airlines will pursue a modified business as usual approach.

If people choose to fly they can reduce the payload of the aircraft by taking minimal luggage and by paying for a voluntary carbon offset, even if one has doubts about them. The only other option is to not fly, or at least reduce flying. But even if people are personally willing to forgo the mobility afforded by flying, difficulties are likely to be raised in workplace and family realms and it’s here the complexity lies.

Death
Death does not involve much choice. Nevertheless this does not mean that there are no choices to be made. Indeed, those making decisions about the disposal of their body, or of a relative’s body, are faced with a growing range of options if they want to be green in death. Such choices involve the intersection of cultural, economic, and environmental issues. If we focus on the issue of death in Western cultures many sustainability complexities arise. Death generates the problem of how to dispose of large amounts of organic matter sustainably. As the population grows the demands on resources by funeral and burial practices will only increase. In parts of Australia, like Sydney, there are shortages of land for burial. However alternatives to burial are not without problems as well. High temperature cremation, the main alternative to burial in the West, has problems relating to mercury emissions, as well as energy consumption and the associated carbon emissions. A recent Dutch analysis of “standard” burials (Keijzer 2011) used lifecycle assessment to analyse the broader environmental costs of different burial options. The results were complex but a key finding was that the bulk of the impacts were not generated by body disposal itself but by other activities associated with burials – things like cards, flowers, food and beverages (such as at a wake), and transport to and from the funeral service or burial. These associated activities had about three times the environmental impact of burial, the highest impact form of body disposal. Even in death there are sustainability dilemmas for households.

REFERENCES
CONCLUSIONS

1. **Households are not homogenous black boxes** when it comes to sustainability issues. They are nuclear families within which parents argue with teenagers about leaving lights or heaters on; they are baby boomers approaching retirement who argue over which stuff to keep and which to throw out; they are extended family households who fight over the television remote control, but who also have impressive capacities for sharing and thus reducing per capita energy and resource use. They are single-person households, student households, couple households in old age, families scraping to get by, blended families, same-sex couples with and without kids, living in a variety of circumstances. Nowhere do households consume stuff or approach environmental issues in identical or predictable ways.

2. There are **perplexing dilemmas of household sustainability**, some technical, some socioeconomic, some cultural. Sometimes the dilemmas are irresolvable: the eReader versus books, the great nappy debate, whether the gains in efficiency in high-density living outweigh the benefits of gardens in larger suburban blocks. Many dilemmas require the disentangling of cultural practices from wider structural imperatives; others require behavioural change to work in tandem with regulation. We need to reduce driving and flying, but that means we also need to build our cities and structure our business practices and holidays differently. We need to wash clothes and flush toilets less often, but that means viewing odour, waste and dirt differently.

3. **Practice, identity and attitudes do not necessarily line up.** Contradicitions abounded in our project. The wealthiest bracket of households were twice as likely to install solar power (although still in very small numbers) as the poorest, but were also the most prevalent users of air-conditioning. The poorest households were most likely to say that they were ‘uninterested’ in climate change as an issue, but they were also the least likely to own LCD or plasma screen televisions or clothes dryers. The poorest households were also the most likely to repair clothing, to use toilet paper made from recycled paper; to buy ‘environmentally-friendly’ detergents; to reuse glass bottles and jars; and to save water by taking shorter showers. Generational differences are another important example. People’s attitudes towards the environment – and the ways in which they run their households – are influenced by the social, economic, political and environmental contexts in which they grew up. Younger generations are more likely to be concerned about climate change but it’s the older generations who are doing most of the sustainability work.
4. Low-income households and women are already doing much of the work of sustainability. The idea that sustainability is solely a middle-class preoccupation is not borne out by our research. Households earning less than $250 per week are statistically more likely to undertake sustainable household practices. They switch off lights in unoccupied rooms and put on extra layers of clothing before turning up the heating. Sustainability is a highly gendered practice in many households. Women spent more time on sustainable practices and did so more often. Women were more frequently engaged in cleaning/laundry and cooking, recycling, switching off lights and appliances, composting and using the compost and/or worm farm.

5. A lot of the work of sustainability is not done for environmental reasons, but for reasons of frugality, or because people dislike waste. This is particularly the case among retirees. People are still alive who grew their own food or mended clothes during periods of wartime rations – a reminder that there are effective systems of provision beyond the industrial capitalist system and stocks of knowledge not yet lost.

6. Enormous knowledge and capacities exist. In households where frugality is a necessity rather than choice, creativity and adaptability is needed to make ends meet. Within and beyond the home are abundant examples of how people share space, resources, appliances, food, books and much more outside the cash economy. Such acts might not yet be enough to overhaul the economy, or extend to all areas of consumption, but they are a resource to be valued.

7. It may be easier to get traction on a range of fronts in domestic than in business contexts. People were much more willing to feel sweaty or dirty at home, where a sense of ‘togetherness’ may be fostered. Thermal variation was tolerated at home, where beanies and slippers could be worn without embarrassment, more than in offices, where ‘all-season’ business suits remain the norm.

8. People don’t like throwing away things that work. Everywhere – from clothes to televisions, furniture to Christmas presents – people continue to privilege the usefulness of things. They keep, store and gift because usefulness still resonates as a core human value. This is an enormous potential source of traction, but it can also create friction against positive change. Retrofitting homes and lives requires willingness to alter things when they become problems, no matter how habitual. The beer fridge is the best example here.

9. Time. Being sustainable takes time, and different types of time, like block time and habitual time. If households want to become more sustainable we need to change our experience of time, but this cannot happen in isolation from wider social practices such as work patterns. Exploring the concept of time helps understand how change occurs – how old practices become deroutinised and new routines embedded.

10. Life transitions provide a moment of intervention. Households invest time in rethinking their practices at major transition points in the life cycle; when they have a baby, when they renovate, when adult children leave home or when they retire. These provide key intervention points for sustainability decisions to be made.

11. Patterns of sociality are foremost in the household – this paradoxically strengthens adaptation. Households are first and foremost social units, and even the most environmentally conscious households place social concerns first. This paradoxically strengthens the capacities of households to respond to severe climate changes ahead. In the event that neither systems of production and consumption nor cultural habits and norms shift in time, the capacities and adaptabilities of households will likely prove vital to our survival and possible future happiness.

12. Any changes that a household makes are limited unless connected to larger scale social movements. This project has focused on households in the relatively affluent context of Australia. Boundless consumption remains ever-possible for the wealthy, inviting the ready exercise of scepticism by the less well off. The challenge is nothing less than immense – the need to coordinate, quickly, promotion of sustainable consumption, collectivization of efforts (underpinned by technical and social research) and profound transformation in government regulation and in the economy itself.

13. Cultural environmental research provides important insights into the complex materiality of our cultural lives that can aid decision-makers.

14. There is more work to be done. One immediate ongoing project focuses on ethnic and religious diversity. In other projects we are working with colleagues from UOW’s Sustainable Buildings Research Centre to examine heating and cooling practices, particularly in low-income households and among the elderly. With the SBRC and other partners we are analysing energy consumption practices in aged care facilities. We are also working to develop comparative approaches across other regions and internationally.
Outputs from this project include honours theses, articles in peer-reviewed academic journals and book chapters. Where theses have been published in the peer-reviewed literature, only the latter is listed here.


Publications in preparation:

Gill, N., P. Osman, L. Head, G. Waitt, C. Gibson and M. Voyer, ‘I have a PhD: I should be able to do these things’: solar hot water systems and the connected household.

Stanes, E., N. Klocker and C. Gibson, Generational differences in household sustainability.

Toole, S., N. Klocker and L. Head, Climate change adaptation and migration in ethnically diverse households.