

Introduction

Is it easy being green? This book discusses sustainability dilemmas faced by households in the course of everyday life. Contrary to the often-espoused rhetoric that being green is 'easy', household sustainability is rife with contradiction and uncertainty. While gains can be made through some actions, they must be traded off against other losses – and sometimes whether these trade-offs are worth it remains unclear. Is it worse to waste the water to rinse out tin cans than to put them in the recycling bin dirty? Is it worse to use plastic supermarket bags for bin liners, or to take reusable green bags to the supermarket but then buy dedicated bin liners (Chapter 9)? Some of these are empirical questions dependent on the chemistry of plastic. But beyond the need for better calculations of these sorts of trade-offs, are dilemmas of everyday practice. How much time do well-intentioned people spend thinking these choices through, debating them within a household? Which members of households undertake this 'thinking work'? Who feels guilty? What could be the outcomes if the same amount of effort was invested elsewhere? Some purportedly 'sustainable' behaviours such as eating local food may in fact prove more damaging than eating imported food, because 'food miles' associated with transportation of fruit and vegetables can be only a minor component of total carbon impact (Chapter 2). Two seemingly identical tomatoes on a greengrocer's counter may involve diverging 'journeys' to the shop, with quite stark differences in carbon impacts depending on a range of factors. Myriad dilemmas and alternative considerations prevail over basic, everyday behaviours and actions.

This book stems from our own frustrations seeking to navigate such dilemmas – but also from a concern that a simplistic set of assumptions about what it means to 'be green' are becoming quickly entrenched. The risk is that simple prescriptions overlook the complexity of dilemmas that surround everyday household choices and behaviours. Our desire to challenge assumptions is not because we are sceptical about climate change – we are not. Nor are we unsure about the need to act urgently. Something has to change, in the face of our current reliance on torrents of resource extraction, production and consumption. The household might be one place to imagine such change. In this book we engage critically, and constructively, with this proposition.

Whether households can readily make a difference is at one level a question of lifestyle and material comforts. Industrial capitalism removed the masses from peasantry and furnished people (or at least, middle-class people) with material possessions and pleasures – even luxuries. People have been promised, and have come to expect, a level of everyday comfort and gratification. Yet this is relatively recent; as little as a hundred years ago people struggled to stay warm or cool, to find and keep fresh food, to access reliable safe water. Billions still do. Nevertheless, today more people than ever before enjoy televisions and international holidays and stockpile large wardrobes of clothes. Such accoutrements are specific to wealthy groups who constitute the minority of the world's population. At various points in the book we confront cultural norms of lifestyle and consumerism that are linked to troublesome environmental problems – and question whether they can be easily unsettled.

The book is unapologetically focused on affluent countries, and especially on 'Western' cultures (in Europe, North America and Australasia). This focus stems from the now accepted wisdom that affluence is intimately linked to escalating greenhouse gas emissions. Households in the global south face entirely different challenges for 'sustainability': for them, consumption may simply mean survival. Our choice to focus largely on the rich world is not intended to cast aside the global south as 'other', but rather to position affluent lifestyles squarely at the centre of the problems of climate change and sustainability. We are also aware that Western cultures and affluent worlds are not one and the same thing. With some exceptions (for example toilets, Chapter 6, and retirement, Chapter 18) we do not focus on Japan and South Korea, although they are affluent. We acknowledge the importance of better understanding household dynamics everywhere, and at times we do look to the global south for insights on how things could be alternatively done. But throughout, we make the point that it is households in those parts of the world already making the largest contributions to greenhouse gas emissions where the most urgent changes are needed.

We are also aware of the various definitions of 'sustainability' and the ideological purposes to which that term is put (Davidson 2010). We focus here on material environmental impacts: greenhouse gas emissions, water and energy use, biodiversity and ecosystem loss, soil erosion and pollution. We also link sustainability to related social justice concerns with equality and exploitation.

We are not for a moment suggesting going 'backwards' to a quaint, pre-industrial age without medicines, sanitation or large-scale infrastructures. Indeed, the need for more integrated, systemic approaches to food security, public health and well-being is heightened with climate change. Rather, our premise is that progress towards a future that ensures prosperity and quality of life will require more than technological or organizational changes. We

somehow also need to transcend seemingly intransigent cultural norms. The household is an especially vivid scale at which such norms are manifest.

At another level, households face dilemmas of practice and circumstance: being green may not in fact be so easy, or its choices self-evident. While in some countries energy and water-use labels are present on new appliances, for the bulk of household consumables their carbon footprint or broader environmental imprint is unknown. Throughout the various chapters in this book we synthesize existing research on the carbon footprints and lifecycle impacts of products – to gain a more complete picture of their environmental imprint. Figuring out a product's true origin and impact amidst marketing spin is difficult enough for just one item, let alone for all the stuff that enters a typical house. People juggle competing priorities and pressures and imperfect information.

Ours is also a very geographical take on household sustainability – for we are all geographers working at the intersection of environmental science, cultural studies and political economy. Our perspective emphasizes how geographical context, socio-economic circumstances and cultural meanings vary. Air conditioning might be justifiable for homes in which infants, the sick or elderly need to stay cool to remain healthy (Farbotko and Waitt 2011), while in other places and circumstances be challenged as an energy-sucking feature of suburban life – an unsustainable norm or even addiction (de Vet 2012) (see Chapter 5). Household use of water and relationships with water-using appliances (such as toilets and solar hot water heaters) vary from dry to wet and cold to warm places, but also with extent of government regulation, age, class, and even religious belief (Chapters 4, 6 and 15). How we deal with the death of loved ones and dispose of their corpses is deeply linked to cultural norms that might not be easily transformed (Chapter 19). Drawing on global examples we seek to *place* the debate about household sustainability rather than speak in generic terms.

This book seeks to progress our collective response to climate change by airing and discussing such dilemmas of sustainability. Only if we properly grasp the dilemmas of sustainability can we hope to go some way to overcoming them.

STRUCTURE OF THE BOOK

The book tackles what we see as flashpoint dilemmas. Each chapter is in turn framed around an essential task, everyday item or practice of household life. In many cases, there are no easy answers as to which course of action is most appropriate. By bringing light to the dilemmas we aim to increase understanding of both the barriers to household sustainability and the 'unsung' sustainability work being done by householders.

Beyond this introductory chapter (in which we set the scene in relevant social science, environmental and policy literatures), we take each flashpoint example of everyday life in the household and frame a concise discussion around them. We draw on international research to grasp the most pressing sustainability problems surrounding flashpoint dilemmas. Issues of the design and manufacture of objects are discussed, alongside available research documenting known energy, water and other resource use implications. Each chapter then moves to discuss fresh insights gleaned from fine-grained cultural research – international where available as well as from our empirical research projects on everyday household sustainability. These latter projects include data from a large survey on everyday household practices, goods, consumption and attitudes in Australia, and in-depth ethnographic material from longitudinal research, where we interviewed households over a two-year period. These studies provide concentrated, fine-grained examples to illustrate more general discussion on the dilemmas of sustainability.

We could not cover every dilemma, or every household activity. There are things we know that have received insufficient attention but would require another whole volume of dilemmas: tampons, weddings, coffee, wine, going to school, medicine, pets, showers, renovations. One of the dilemmas (in the book as in everyday life) is which dilemmas matter more than others. Because each chapter is concise we have made choices to focus on especially vivid examples (such as nappies, in Chapter 1) or insightful vignettes from ethnographic research (as with water tanks, Chapter 4). Some chapters slice a particular ‘angle’ through an issue and therefore cannot cover others. Some by necessity have a more technical flavour (as with solar hot water heaters, Chapter 15) while others confront knotty moral conundrums (as with toilets, Chapter 6). Nevertheless, throughout we share a sensibility attuned to dilemmas and contradictions, frictions and pathways for traction.

THE HOUSEHOLD SCALE

A central premise of this book is that the household scale matters – but in complex ways – to the human response to climate change, and more broadly to problems of conservation, biodiversity protection and sustainability. Households make sense both to the people who live in them, and to government policy makers, as foundational social units (Lane and Gorman-Murray 2011), and are frequently used to measure the consumption of energy, water and materials. In affluent urban societies households are an increasing focus of government policy on sustainability. An expanding research literature considers the household as a crucial scale of social organization for pro-environmental behaviour (Reid et al. 2010; Gibson et al. 2010; Lane and Gorman-Murray 2011; Tudor et al. 2011).

Across the global north governments at all scales have, to varying degrees, aligned households with sustainability. Governments have funded support for solar panels, home insulation, water tanks, light globes and shower timers in efforts to reduce greenhouse gas emissions, water and energy consumption. Local programmes, typified by the Sustainable Illawarra Super Challenge in our home city, Wollongong, encourage householders to become more environmentally sustainable by refusing plastic bags, composting, establishing vegetable gardens and catching public transport. Marketing materials use 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).

Despite the enthusiasm 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 (Strengers 2011). Water tanks do not save as much water as predicted (Moy 2012) (Chapter 4). Education programmes emphasizing that ‘it’s easy being green’ understate the amount of domestic labour involved, and sidestep the question of who does the work (Organo et al. 2012). Residential energy consumption continues to rise, due to a combination of bigger homes containing more appliances and computer equipment, a growing population and a declining number of people per household (Australian Bureau of Statistics 2009). Furthermore attitudes and practice often do not match. Some of the most avid water savers vehemently express anti-green attitudes (Sofoulis 2005, 447), drawing instead on a rhetoric and identity of frugality (Chapter 4). At various points in the book we see the sustainability work being done by low-income households who do not necessarily identify as green, but who do consume less.

It is a truism that sustainability challenges are complex, but in this book we contend that the conceptualization of the household in environmental policy has not been complex enough. Many policy approaches treat households as black boxes – freestanding, bounded social units operating only at the local, domestic scale. The difficulty of tracking the contribution of 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 (ABS 2003). As the growing literature on carbon and other ecological footprints makes clear, this variation is partly an issue of data measurement and scale (Wilson and Grant 2009). We argue here that there is also 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?

Our response to this challenge develops what in the social sciences and humanities is known as a *relational* approach. The basic tenet is that the household, as a social-geographical scale, is entangled relationally with other actors at ‘larger’ and ‘smaller’ geographical scales. Relationality challenges the idea that we can ‘identify discrete scales from which causes originate and at which effects are felt’ (McGuirk 1997, 482). Thinking of households as discrete entities forces ‘processes, outcomes, and responses... into distinct “boxes”’ (McGuirk 1997, 482). In contrast, relational thinking encourages analysis of a variety of actors, big and small, human and non-human, intertwined in patterns of power relationships (Bennett 2010). Multiple materialities and networks make up the family home (Kaika 2004; Blunt 2005; Head and Muir 2007a).

This sort of thinking alters where one might go looking for the root causes of problems, and how one might subsequently trace actions and responses. For instance, are gatekeepers – educators, newspaper editors, carbon offset retailers, energy-saving websites, solar hot water installers, electrical switches – as important as individual household actors? Gatekeepers mediate relationships and flows between scales and things. The relationships between scale and order, or scale and causation, should not be assumed but be the subject of empirical enquiry. Gille and O’Riain (2002, 286) make the further point that level of analysis should not be confused with the level of abstraction – the global is not necessarily universal, and the local is not necessarily particular (Hulme 2010). Actions at the ‘global’ scale do not necessarily supersede or cascade ‘down’ to those ‘locally’ (Bulkeley 2005). To say that scale is both socially produced and relational does not deny that particular scales can become fixed, reproduced, and influential. Rather, geographical scales are entry points into the jumbles of things, relationships and differential capacities for agency that make and remake the world (Waitt et al. 2012a).

The household is one such scale. It is a common sense unit that operates as a ‘spatial fix’ for a variety of policy and social logics, but one that *becomes*, rather than merely exists *a priori*. There is nothing ‘natural’, for instance, about gender roles within families – these come into being through social norms and practices, in turn shaping deeply who does the work of sustainability in the household (Organo et al. 2012; see Chapters 1, 2, 7, 12). We explore households as social assemblages with variable gender, age, class, ethnic and familial structures (Blunt and Dowling 2006). 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 homeowners, private and public renters, and unit and house dwellers (Farbotko and Waitt 2011; Klocker et al. 2012). Households will also argue within themselves over the best courses of action, as discussed here in relation to nappies (Chapter 1), clothes wash temperatures (Chapter 3), how to

keep warm in winter (Chapter 5) and what stuff to keep or to throw out (Chapter 13). Households are homes in which social relations are the core human concern; in which families bond, people invest emotions and undertake all kinds of identity work beyond the putatively 'environmental'. Furthermore, as Hinchliffe (1997) argued, homes are understood as a refuge or haven from the problems of the world, confounding its potential role as a site of climate change mitigation via changes in household practices.

What exactly constitutes a 'household' is increasingly contested, as demographic and physical definitions (based on family units and/or buildings) are supplanted by notions of the household as networks of connections that mediate relations with other publics, with nature, with outside institutions (Reid et al. 2010, 318). The black box is revealed to contain humans and diverse non-humans, its own cohabiting things, complex politics and practices. The challenge is, to quote Ruth Lane and Andrew Gorman-Murray (2011, 2), 'to consider the operations of the household in terms of interactions between different animate and inanimate entities'. Homes are containers for appliances, pets, stuff – none of which we should take for granted as inanimate or powerless, or as disconnected from wider movements and flows. The black box is porous. Home spaces and the people and things that live in them are inextricably linked into the social, technological and regulatory networks that make up suburbs, cities, regions and nations.

Granularity is therefore needed to disentangle the complex assemblage that is the household. This is one reason why we have chosen to organize the book into digestible vignettes around everyday things and concerns. At the same time, however, we are mindful of Diana Liverman's (2008) question about how to 'upscale' social research to match scientific datasets, if social and cultural researchers are to participate in policy debate over climate change. This book seeks to bring together a more complex overall picture of households and sustainability, assembled from synthetic discussion of the atomized things and practices that typify home life.

It is important not to assume that households in the affluent West are powerless. The issue is how power is exercised in relationships between actors. Some of these actors include the state, infrastructure providers and planners, while in other directions relationships exist with appliances (and their manufacturers), retailers, corporations, communities – with even water and energy itself. Households have capacities and can generate traction along diverse pathways – sometimes informal and unheralded. Some such pathways are gradual, opening possibilities for change where immediate overhaul is unlikely, such as with norms of toileting (Chapter 6) or Christmas (Chapter 17). Other pathways depend on capacities to adapt quickly – as with responses to financial hardship (such as finding ways to heat bodies in winter without need for electric heaters – Chapter 5). In certain circumstances resisting

change can be productive – as when ignoring the imperative to consume clothes or furniture as fashion items (Chapters 3, 8) or not turning on the air conditioner (Chapter 5). In this understanding, the ‘local’ – which can include the household – does not just feed into pre-existing scales of something bigger in accumulative fashion, but rather can itself be a generative site of creative possibilities. We therefore put to the test this vision of transformation and change – in which the household might be one vital, if not straightforward, site of action.

PLACING THE HOUSEHOLD IN CLIMATE CHANGE AND SUSTAINABILITY DEBATES

Consuming Citizens

How have households been placed in debates about sustainability and climate change?

First, there has been a considerable focus on consumption, particularly in official and corporate programmes that have sought to change household behaviour on environmental grounds. For Slocum (2004), climate change programmes operate within the neoliberal state, assuming citizens are mere passive ‘consumers’. Sustainability however relies on the notion of the ‘responsible, carbon-calculating individual’ (Dowling 2010, 492), constructed in climate change campaigns as the new ideal citizen-consumer (Rutland and Aylett 2008). Promotion campaigns risk treating people merely as consumers rather than citizens or active subjects negotiating everyday lives (Burgess et al. 2003, Malpass et al. 2007).

The assumption is that many households are ‘doing the wrong thing’ vis-à-vis sustainability. Households are, to use a somewhat unwieldy phrase from governmentality theory, *problematized* as sites of excessive consumption, urban sprawl, and overuse of energy and water – no more so than in the typecasting of new-build homes as ‘McMansions’ (Nasar et al. 2007; Dowling and Power 2011). Ideal sustainable citizens transform themselves in response to this problematization – weaning themselves off high energy lifestyles. Smuggled into this narrative is, however, a subtle shift that places the burden of responsibility for change onto householders, rather than onto governments or corporations.

Campaigns framed around everyday technologies such as recycling bins, energy-saving light bulbs and shower timers trigger discussions of environmental ethics within households. In turn they ‘produce’ sustainable citizens who buy the right things and install new green technologies around the home, reduce car dependency, lower heating thermostats or raise air conditioning settings (Hobson 2006). However as both Davidson (2010) and Knox-Hayes (2010)

argue, this keeps intact the institutions of capitalist democracy – markets, corporations, governments – and emphasizes that households must govern their own actions in order to become ‘proper’ sustainable citizens.

How households react is, nevertheless, unpredictable. As Scerri’s (2011, 175) survey work with households in Melbourne demonstrates, ‘householders are rejecting official claims that “rational” sustainable consumption choices and self-regulatory approaches will achieve the kinds of changes that sustainable development necessitates’. Overall, the conclusion from research assessing education campaigns is that promoting public awareness of global risks is inadequate to change behaviour (Lorenzoni et al. 2007, Robbins 2007). Humans are social beings acting in the contexts of communities and landscapes, not atomized individuals driven solely by rational economic or environmental preferences (Hobson 2002; 2003). Household adaptations vary in different contexts (Potter and Starr 2006; Hulme 2008), and are more than just the amalgam of individuals’ ‘energy minimizing’ actions (Gibson et al. 2010).

We do not assume that any particular actions and behaviours by householders are necessarily ‘better’ than others. Imperfect information about total environmental impact of commodities and actions prevents this (Gibson et al. 2011). Some of the dilemmas occur when ‘sustainability’ behaviours are at cross-purposes, but we also are conscious that green morality is closely linked to green consumerism (Chapter 3). Rather than promote this, we seek to situate households in complex scenarios where competing interests, trade-offs and moralities collide.

Environment is just one line of responsibility being juggled in acts of consumption, which necessarily serve different anticipated needs (Dowling 2000; Burgess et al. 2003). Urging households to behave responsibly has its limits, with what constitutes ‘responsible’ behaviour developed within social practice, rather than abstractly distant from it. In the absence of mandated action or new infrastructure that shifts what is ‘normal’ (Shove 2003), we discuss how household consumption can remain unchanged for reasons that are perfectly ethical from that household’s point of view. Everyday household behaviours depend on deeply held motivations, social norms and psychological predilections (Barr 2003; Head and Muir 2007b).

Likewise, we do not automatically assume that households should bear the burden of responsibility for transformation. In various chapters lively debate emerges over whether, for instance, manufacturers ought to bear the responsibility of disposal and recycling – from nappies (Chapter 1) to mattresses (Chapter 8) – or whether retailers ought to be more transparent with the energy and water use impacts of various goods on sale, such as televisions and computers (Chapter 13). Rather than looking for patterns of compliance with government sustainability objectives, we look instead at prosaic actions, and motivations that might be pro-environmental, or more-than-environmental.

Climate Talk – and Action?

A second way in which households are placed in climate change and sustainability debates is in relation to scientific knowledge and ideas – the manner in which information flow connects with or influences practices. Research is increasingly concluding that programmes informed by science encounter and generate scepticism and distrust as a matter of course – not as a result of poor communication or misunderstandings, but as a result of public assessments of institutions and clashes of divergent rationalities (Hinchliffe 1996). People may accept climate change science, but not act on it because climate change may be unthinkable within the confines of everyday life.

Relevant here are examples of science communication and behavioural change research. Scholars have sought to better understand individual response to governmental policy changes (e.g. Barr 2007), and what makes government-sponsored education campaigns effective or otherwise (Lorenzoni et al. 2007). Factors preventing or facilitating behaviour change are becoming clearer: for instance that fear fails to catalyse action (Hulme 2007), and that affective and emotional registers are as important as factual information in engaging with an issue as opaque as climate change (O'Neill and Hulme 2009). Emotions and the senses (sight, hearing, smell, touch and taste) also filter everyday practices such as eating (Chapter 2), wearing clothes (Chapter 3), toileting (Chapter 6), cleaning (Chapter 7) and driving (Chapter 10). Sustainability is embedded in daily bodily rhythms, senses and emotions irrespective of what courses of action might appear 'rational'. How 'households' are conceptualized in climate change adaptation talk, and whether this relates to the way people live and make homes, is a key tension running throughout the book.

Structures and Regulations

Third, broader economic and social trends provide extra complexity and contradiction. At the broadest level, only a small proportion of technological innovation is geared towards reducing energy or resource consumption, especially around industries such as electronics and information technology – innovation is driven instead by the profit motive and the saleability of new features and functions (Røpke 2012). This, in turn, is structurally linked to wealth – to those who can afford to purchase the newest, most advanced home products.

Notwithstanding the myriad subtleties discussed throughout this book, the strongest predictor of carbon footprint/greenhouse gas emissions is affluence, at both the macro and the household scale (ACF 2007). The best way to reduce your environmental impact is to be poor, as economic activity is strongly

coupled to fossil fuel use. The rich pollute more through more and bigger houses; more food wastage; more consumption generally. Yet the rich and well-educated may be among the strongest advocates of 'green' practices: recycling, composting, buying organic food, taking reusable bags to the supermarket. They may also be leaders in buying still-expensive hybrid cars, solar electricity panels and green energy. Here lies a deeper dilemma: between 'green' as a means of distinction, to accumulate cultural capital (Askew and McGuirk 2004), and the pro-environmental motivations underpinning action. It is a dilemma borne out in various chapters of the book – from clothing (Chapter 3) to flying (Chapter 11) – where we report from our ethnographic and survey work on the contradictions of middle-class green consumerism.

Related to this intersection with broader economic processes is the volatile nature of the global economy – currently experiencing financial and sovereign debt crises in the United States and Europe. It is no coincidence that the only time in recent decades where carbon emissions actually fell globally was in 2009, when global economic growth collapsed in the wake of the financial crisis (Climate Commission 2012). At the centre of this were households, who, research has shown, responded to global economic crisis by reducing driving, becoming more frugal shoppers and spending more time at home as opposed to going out or on holidays (Leinwand et al. 2008). All of these translated into reduced emissions. Perversely, continued volatility may be the best thing for immediate climate change mitigation efforts.

The complication at the scale of households is, of course, that volatility manifests in widespread unemployment and threats to livelihoods. Even in the highest-carbon emitting countries of Europe and North America it cannot be assumed that households can respond to sustainability initiatives from a state of prosperity or stability (Leichenko et al. 2010). The household may be one scale where meaningful moves to reduce carbon emissions can be made, yet it is also at the scale of the household that economic risk is simultaneously, and most profoundly, experienced (Aalbers 2008). One outcome may be reduced household consumption as families tighten their belts. Another is that green consumerism, which grew during the boom times of the 2000s (Beard 2008), becomes more elitist. Nevertheless, as we shall see throughout the book, much of the work of sustainability is already being done by those with least capacity to pay – for example elderly people who exercise frugality and thrift as a matter of course, with memories of making do amidst world wars and rationing. Wealth is far from the only precursor to sustainable acts.

Beyond overall wealth as a key variable, other structural and material factors intersect with dilemmas of household sustainability. Both energy and CO₂ are strongly linked to type of dwelling, tenure, household composition and rural/urban location (Druckman and Jackson 2009). Although low-density urban form has worsened car dependency (Chapter 10), there are other

benefits, as Chapter 16 shows in relation to gardens. Some argue that the most critical contributions to household carbon footprint stem from life-course transitions such as having a baby (Chapter 1) or getting divorced (Yu and Liu 2007, Murtaugh and Schlax 2009). But policy imperatives that might stem from some such studies – for example, having fewer children, or avoiding getting divorced – are likely to have missed the point. Can it be assumed that households will willingly change behaviours – and even family composition – in line with government objectives? This plays out in the book in various ways, in relation to decisions to have children (Chapter 1), to live in extended family households rather than traditional nuclear structures (Chapter 13), and whether to downsize or consume less when retiring from the workforce (Chapter 18).

Regulatory frameworks also vary greatly – as do relative contributions of nations to global warming. Only 37 countries had targets under the Kyoto Protocol (although 90 per cent made ‘pledges’) (Climate Commission 2012), and the per capita contributions of, for instance, Australians (27.3 tonnes of carbon dioxide equivalent (CO₂-e) per person, per annum) and Americans (23.4 CO₂-e) are substantially higher than most other OECD nations (Japan 10.5 CO₂-e; European Union 10.3 CO₂-e) (Climate Commission 2012). Comparing household sustainability dilemmas across such countries is not straightforward. Carbon pricing has the potential to even out comparison, but it too is being introduced in fits and starts internationally – in some countries at the city (Japan) or state (United States) scales, in other jurisdictions as multilateral initiatives (e.g. the European Union) (Climate Commission 2012). Potential improvements in emissions may have less to do with household practices than with transitions in regulatory regimes, in supply chains or in energy generation methods nationally: when, for instance, national power companies switch fuel sources (from coal to gas) (Druckman and Jackson 2009). Another is the structure of the food supply chain – where for example much food wastage occurs because of the nature of the legal agreements between farmers and supermarkets (UN FAO 2011). Some things are out of the immediate hands of households.

Nevertheless energy labelling schemes can assist households in making purchasing decisions. The most commonly labelled appliances are refrigerators, freezers and air conditioners – though in some countries labels are also available on rice cookers, boilers, lighting products and washing machines (Boström and Klintman 2011). There are wide variations nationally (Harrington and Damnic 2004). Not all labelling schemes help, either. Best-before dates on food products are a rational response to public health concerns over freshness, and have helped reduce the risk of gastrointestinal illness, but nevertheless generate huge amounts of waste, encouraging those who can afford to waste food to throw away what might be edible items (Chapter 12).

THINGS

The home place is full of ordinary objects. We know them through use; we do not attend to them as we do to works of art. They are almost a part of ourselves, too close to be seen. (Tuan 1977, 144)

However solid the physical dwelling, the home is in one sense nothing more than a membrane through which energy and stuff flows (Biehler and Simon 2011), in what Fine and Leopold (1993) called ‘systems of provision’. For commodities to come to be as they are requires routes of manufacture, distribution and consumption, architectures, manufacturing processes, infrastructures, environmental transformations and cultural meanings. Such practices and processes are not neutral; rather they generate ethical complexities that require interpretation within normative environmental and social justice parameters (Castree 2004). Throughout chapters in the book we make attempts to ‘follow the things’ (Cook 2006) on their journeys from raw materials to production, distribution and home consumption.

What transpires is that those journeys are often complex and opaque, making it very difficult to ascertain the interrelationships between products consumed and downstream environmental impacts (Lenzen et al. 2012). In just one study – of the lifecycle assessment of disposable nappies (Chapter 1) – researchers had to take into account land area required to grow trees to pulp into cellulose (the absorbent part of nappies), which in turn required consideration of varying forestry practices, which then led to consideration of run-off impacts, which in turn impacted stream flows, which can be detrimental to freshwater ecosystems (O’Brien et al. 2009). Put another way, the nappy on a child’s bottom is linked causally – if in complex ways – to deteriorating fish spawning ecosystems in a stream near a pine forest somewhere unknown. It is also likely linked to soil pollution in a landfill site on the edge of a municipality somewhere else, where, it is estimated, the nappy will take 200 to 500 years to break down.

Some systems of provision are very fixed, and some are fluid. Where they are fixed, any changes that a household makes may be limited unless connected to larger scale infrastructural and technological change (Lawrence and McManus 2008). Where they are fluid, households may be able to contest wider patterns of consumerism through bargaining networks and informal sharing with friends, relatives and neighbours. Here details of the materiality of the things – and the social uses to which they are put, such as sharing (Belk 2010) – matter enormously.

The material spaces of the household, and the things in them, can be structured by human activity, but also have agency in their own right. Home designs with poor passive solar design ratchet up energy use in heating and

cooling (Chapter 5), as do appliances with stand-by functions, and washing machines that default to warm water washes (Chapter 7). Tablets, smartphones and Wi-Fi technology combine to make 'always-on' the norm for home internet connectivity, using energy 24-hours daily (Chapter 13). Refrigerators stretch the period in which we can safely eat food (and leftovers), but also encourage us to buy (and waste) more food (Chapter 12). Several of the things in the house cooperate with our wishes and go largely unnoticed – mattresses (Chapter 8), fridges (Chapter 12), hot water heaters (Chapter 15) – until they degrade, break down, or decide to become entirely uncooperative.

At various points throughout the book we pursue such things about the home, taking seriously the 'vitality of matter and the lively powers of material formations' (Bennett 2010, vii). This is not meant to transfer responsibility for acting from humans onto the 'things' we consume (or their design – as if mere improvements in technology were enough), but rather to take seriously 'the capacity of things – edibles, commodities, storms, metals – not only to impede or block the will and designs of humans but also to act as quasi agents or forces with trajectories, propensities, or tendencies of their own' (Bennett 2010, viii). Gay Hawkins argues this case powerfully in relation to household waste. Any cultural understanding of waste needs to go beyond the fantasy of human control over non-human others:

As one of our most everyday habits, disposal depends on a particular kind of blindness that helps us *not* see, *not* acknowledge the things we want to be free of. To throw things away is to subordinate objects to human action, it is to construct a world in which we think we have dominion. This doesn't just deny the persistent force of objects as material presence, it also denies the ways in which we stay enmeshed with rubbishy things whether we like it or not. (Hawkins 2006, 80)

Seemingly prosaic acts – starting a worm farm or compost bin, recycling paper and other materials for children's school art projects – interrupt flows of material stuff in and out of the household, forging a 'different means of engagement with waste' (Hawkins 2006, 128; see also Hetherington 2004; Moore 2012). They also reconfigure relationships with worms, microbes and children. How we engineer and design goods for their reuse as well as intended purpose is critical – as is a stronger sense of stewardship in relation to the things in our lives (Lane and Watson 2012). In this vein, Gregson et al. (2007, 683) tracked practices of storing and reusing, arguing that

whilst people certainly did get rid of consumer objects via the waste stream, they also went to considerable lengths to pass things on, hand them around, and sell them, and – just as often – quietly forgot about them, letting them linger around in backstage areas such as garages, lofts, sheds, and cellars, as well as in cupboards and drawers.

Such ‘stockpiling’, we shall see, features in a number of the chapters in this book, in relation to clothes (Chapter 3), furniture (Chapter 8), electrical equipment, books and CDs/DVDs (Chapter 13) and phones (Chapter 14).

We ask how easy or difficult it might be to reconfigure connections between people, things and material spaces – and what are the sustainability implications of such reconfigurations. How is sharing of appliances assisted or hindered by house design? We shall see how families turn garages into bulk storage zones; how bedrooms become spaces of private recluse; how open plan designs – problematic for their energy-sucking qualities when heated or cooled – also enable communal meals; how lower floors are turned into granny flats – each in turn contributing to altered per capita energy and water use. But are there limits? How easily are televisions and cars shared? How such things play out is in large part a function of cultural proclivities towards communal family life, comfort, cleanliness, privacy and independence, but also a function of underlying infrastructure provision (roads, recycling schemes, telecommunications infrastructure). In all this, cars, televisions, wires, bins, home layouts and kitchens are animate, lively things.

EVERYDAY PRACTICE

Most incentive and education programmes pay little attention to the ways household energy, water and other resource consumption practices are part of the rituals, rhythms, emotions, habits and routines of everyday life (Shove 2003; Gregson et al. 2007). Cultural norms shape household consumption in complex and uneven ways (Lorenzoni et al. 2007). Sustainability campaigns normally fail to appeal to or appreciate the emotional meanings attached to material possessions (Allon and Sofoulis 2006; Hobson 2008) or home spaces (Blunt and Dowling 2006) – or because of ‘counterintentional’ habitual behaviour (Maréchal 2010). People fly around the world for business and holidays, and to visit loved ones, even when they know about the intense environmental impacts of aeroplane travel (Chapter 11). So too austerity, hoarding, sharing and charity donations – all cultural practices with implications for reducing consumption – require analysis in specific social settings to ascertain motivations and meanings.

Increasingly sophisticated waste management systems now enrol households in recycling, composting, sorting and disposing, but what constitutes ‘waste’ in households is far from straightforward, and official schemes only capture a proportion of the potentially recyclable waste stream. The corporatization and technological sophistication of household waste schemes contrasts with everyday practices of disposal, reuse and recycling – many of which are highly informal and operate outside official schemes (Lane et al. 2009). An

older generation who grew up with the frugality of a depression and wars might save and reuse glass jars, tin cans and bits of string, items that younger family members rid, as 'waste', or send off as recyclable things through official schemes, as a matter of course (Chapter 19).

Inside the house we encounter norms of cleanliness, for both human bodies and their clothes, which embed increasing levels of water consumption in the bathroom and laundry (Shove 2003; Troy et al. 2005; Allon and Sofoulis 2006). Is showering a means to hygiene (Chapter 7) or a 'leisure activity' (Chapter 15)? How often should clothes be washed (Chapter 3)? Teenagers may have four changes of clothing and more than one shower a day, for example as they exercise, attend university, go to their part-time job, and then go out at night (Sofoulis 2005). The particular dirt of each context has to be removed by washing from both bodies and clothes. Chapter 7 explores such issues and the measures people take to avoid being sweaty or dirty, while Chapter 6 explores the confronting extension of this: how we relate to our own (and others') faeces, through toileting practices and norms. There are clear implications in these examples for water and energy consumption. Other forms of household 'waste' are less likely to be experienced in terms of human disgust, but are stockpiled, stored or displayed in wardrobes, attics and basements: 'the detritus of urban life ... doesn't destabilize the self. It just hangs around largely ignored' (Hawkins 2006, 3). Collecting nevertheless opens up awareness for sharing and an afterlife for things.

Throughout the book we identify frictions and points of traction to help think about how different elements of governance, materiality and practice interact in the context of the household. Technology, cultural meaning and social practice converge in a variety of ways that are both resistant and amenable to transformation. We also draw on Shove's (2003) metaphor of the ratchet to discuss the role of tools and technologies in the making and remaking of everyday household practices. She illustrates how changing social norms, say in terms of cleanliness and washing clothes, may counteract efficiency improvements within systems of provision. The recent permeation of information and communication technologies (ICT) into households is a different sort of example: a 'new round of household electrification, comparable to earlier rounds that also led to higher electricity consumption' (Røpke et al. 2010, 1764). The uptake of ICT and Wi-Fi ratchets up emissions. Nevertheless changing use of computers and televisions opens up spaces of traction, for instance through reduced material production of CDs, DVDs and books (Chapter 13). 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 friction may involve pathways of resistance to more sustainable outcomes, or contradictory practices that entrench problems. Traction can result from the de-routinizing of previous practices – when, for instance, families move houses

and old habits are – temporarily at least – interrupted (Maréchal 2010). The term traction also helps identify useful points of intervention: policies, key players, levers, intermediaries or translators, both human and not.

MEASUREMENTS AND METHODS

Before we begin our journey through the home, some words are needed on measurements and methods used in research on household sustainability (and in our own survey and ethnographic projects). At various points we draw on published, peer-reviewed analysis of the environmental impacts of forms of production, and activities such as flying, driving and dying. We also draw heavily on our own suite of quantitative survey and qualitative ethnographic research with households.

Methods of assessing environmental impacts vary – and indeed the devil in the detail for household sustainability is magnified by variations in the methods of accounting used. Most commonly we draw on previous studies of accounting energy, water and carbon emissions, and on lifecycle assessment (a ‘cradle-to-grave’ study of a product’s environmental impacts, from raw material extraction through manufacture, distribution, home consumption, use, repair and disposal or recycling). To a lesser extent we also cite results from ecological footprint analysis (a measure, *global hectares*, or gha, in total land area, of the total demand on the earth’s ecosystem generated in order to support a lifestyle).

Each method has its weaknesses, hampering interpretation of sustainability dilemmas. Lifecycle assessment, for instance, is based on calculations of averages, often within bounds of a spectrum of conservative to extreme estimates. Lifecycle assessment provides some means of comparison between products, but struggles to capture wild differences in the *manner* in which people use a product. This becomes relevant, for instance, in the chapter on screens (Chapter 13), where the debate about digital versus hard copy consumption of reading material, music, films and television shows depends a great deal on exactly how many books, CDs or DVDs are being replaced by an eReader or laptop. Intensive use of a high-carbon embedded product by one person might cast an entirely different light on that product’s average lifecycle impact.

Where we refer to statistics on carbon emissions, we tend to use the carbon-equivalence figure (expressed as tonnes of CO₂-e). Visualizing tonnes of CO₂-e is not at all easy: unlike solid materials, carbon emissions are difficult to gauge in quantity. For what it is worth, Wright et al. (2009) provide a useful set of comparisons that are more easily imagined: one standard plastic garbage bag, if filled with carbon dioxide, would contain about 100 grams of it. Or put

differently, one tonne of CO₂-e can be imagined as 10 000 garbage bags filled with carbon dioxide.

There are difficulties, too, in tracking carbon emissions accurately across a population, let alone for individual products or actions. CO₂ embedded in consumption, for instance, is calculated using methods of environmental input-output modelling that are data and resource intensive – complicated enough even if the required data is available within one country; wildly complex if the product in question is made elsewhere, or made using components from several countries (Druckman and Jackson 2009, 2067). The result is that some things can be more reliably assessed for their carbon emissions than others: CO₂ emissions resulting from direct household fuel use, flying or driving is relatively straightforward, whereas estimating the embedded emissions in a television or a computer is a practical nightmare.

Care must also be taken in interpreting singular calculations of the lifecycle impacts or carbon emissions embedded in individual products, as if their ‘report card’ rested solely on their separate existence. As discussed above, a relational view of household sustainability dilemmas seeks to interpret humans and various non-human things in networks of distributive agency within and beyond the family home. What this means is that all products and activities assessed need to be held in tension with the calculations of all others within a household, and contextualized within the practices and dynamics of household life. Thus it is possible that changed consumption practices eliminating carbon emissions in one area of household life may be replaced with others that ramp up emissions. Saved money from one thing is transferred to another, with negligible overall carbon emissions savings. Druckman and Jackson (2009, 2068) illustrate with the example that ‘when respondents in a survey were asked how they would spend any savings accrued from lower energy bills, the most common single answer was “an overseas holiday involving air travel”’. Such rebound or backfire effects are highly unpredictable and context-dependent.

Supplementing our use of published statistics and research findings is our own data, generated via successive large research projects in our research centre. First was a large household survey conducted in Australia in July 2009 as part of a project drawing on mixed methods to explore climate change in everyday life. A 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 socio-economic characteristics, household consumption practices, everyday objects, activities and practices, and judgements of climate change.

The sample size reflected the need to generate approximately 200 usable 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. 2012b for further detail). When we refer to 'our survey results' throughout the book, it is from this large quantitative activity that statistics are drawn.

Throughout the book we also draw on qualitative ethnographic work conducted over a decade on a series of interrelated 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 were derived as complements to this main ethnography, on which we draw here for more specialist purposes. 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 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 the book 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), backyards (Head and Muir, 2007a), clothes (Gibson and Stanes 2010), cars (Waitt and Harada 2012), tomatoes (Roggeveen, 2012), kangaroo meat (Appleby 2010) and wheat (Head et al. 2012). It is to such seemingly ordinary, everyday things in the household that we now turn.