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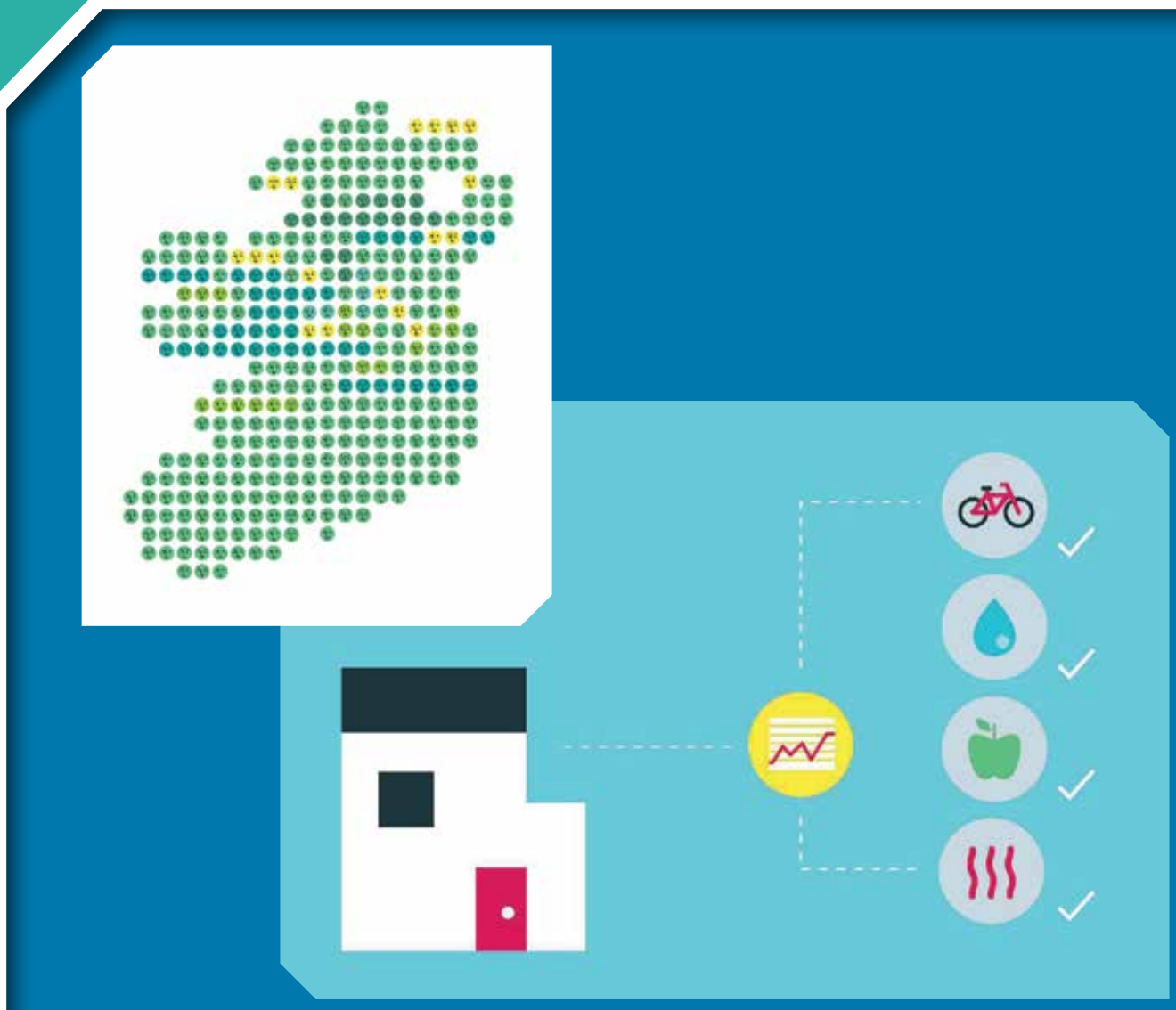
CONSENSUS II: Segmentation, Experimentation and Biographies for Sustainability

Authors: Anna Davies, Frances Fahy, Henrike Rau, Laura Devaney, Ruth Doyle, Mary Jo Lavelle and Richard Manton



Roinn Cumarsáide, Gníomhaithe ar son na hAeráide & Comhshaoil
Department of Communications, Climate Action & Environment

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- Office of Environmental Enforcement
- Office of Evidence and Assessment
- Office of Radiological Protection
- Office of Communications and Corporate Services

The EPA is assisted by an Advisory Committee of twelve members who meet regularly to discuss issues of concern and provide advice to the Board.

EPA RESEARCH PROGRAMME 2014–2020

CONSENSUS II: Segmentation, Experimentation and Biographies for Sustainability

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EPA Research Report

Prepared for the Environmental Protection Agency

by

The CONSENSUS Research Project

Trinity College Dublin and National University of Ireland, Galway

Authors:

Anna Davies, Frances Fahy, Henrike Rau, Laura Devaney, Ruth Doyle, Mary Jo Lavelle and Richard Manton

ENVIRONMENTAL PROTECTION AGENCY
An Ghníomhaireacht um Chaomhnú Comhshaoil
PO Box 3000, Johnstown Castle, Co. Wexford, Ireland

Telephone: +353 53 916 0600 Fax: +353 53 916 0699
Email: info@epa.ie Website: www.epa.ie

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Project Partners

Professor Anna Davies
Geography
School of Natural Sciences
Trinity College Dublin
Dublin
Ireland
Tel.: +353 1 896 1554
Email: daviesa@tcd.ie

Dr Frances Fahy
School of Geography and Archaeology
National University of Ireland, Galway
Galway City
Ireland
Tel.: +353 91 492315
Email: frances.fahy@nuigalway.ie

Professor Dr Henrike Rau
Ludwig-Maximilian University Munich
Department of Geography
D-80333 Munich
Germany
Tel. +49 89 2180 4179
Email: henrike.rau@geographie.uni-muenchen.de

Dr Laura Devaney
Geography
School of Natural Sciences
Trinity College Dublin
Dublin
Ireland
Tel.: +353 1 896 3793
Email: ldevaney@tcd.ie

Dr Ruth Doyle
Geography
School of Natural Sciences
Trinity College Dublin
Dublin
Ireland
Tel.:+353 1 896 3793
Email: rdoyle@tcd.ie

Dr Mary Jo Lavelle
Geography
School of Natural Sciences
Trinity College Dublin
Dublin
Ireland
Tel.: +353 1 896 1054
Email: lavellmj@tcd.ie

Dr Richard Manton
School of Geography and Archaeology
National University of Ireland, Galway
Galway City
Ireland
Tel.: +353 91 495505
Email: richard.manton@nuigalway.ie

Contents

List of Figures

List of Tables

Executive Summary

Phase I of the Consumption, Environment and Sustainability (CONSENSUS; see Report No. 138) Project, completed in 2013, resulted in the first comprehensive analysis of household consumption practices in Ireland. Through extensive engagement with stakeholders, CONSENSUS interrogated four key areas of household consumption – transport, energy, water and food – that together create significant challenges for achieving more sustainable development in Ireland. The research generated valuable new knowledge for academic and practitioner audiences, leading to a number of novel and practical proposals for integrated policy, technology and lifestyle interventions for sustainable consumption.

Phase II of CONSENSUS (hereafter CONSENSUS II) focused on testing, implementing and evaluating these interventions in terms of supporting transformative changes in how we carry out our daily eating-, washing- and mobility-related activities. This synthesis report provides high-level findings across three complementary work packages: segmentation analysis, novel living laboratory interventions called HomeLabs, and mobility biography and milestone mapping. These work packages apply novel techniques for understanding why people behave as they do and have generated tangible data and recommendations for public, private and civil society actors to support more sustainable consumption practices and assist in the necessary transition towards a more sustainable future.

Work package 1, "Segmenting for Sustainability on the Island of Ireland", developed and implemented two innovative and practical quantitative typology tools to segment CONSENSUS Lifestyle Survey respondents into eight different groupings based on reported occasional and habitual pro-environmental behaviours and attitudes. Groups comprising the occasional behaviour typology were labelled "Dark-Greens", "Browns", "Light-Greens" and "Yellows". Groups that comprised the habitual behaviour typology were labelled "Ever-Greens", "Aspiring-Greens", "Accidental-Greens" and "Never-Greens". All groupings were subsequently profiled with respect to socio-economic and demographic variables. Results indicate that socio-demographic and attitudinal profiles of householders undertaking habitual pro-environmental behaviour differ significantly from those that engage in occasional actions. Key differences were observed for socio-demographic variables including age, gender, income and education. This study recommends a tailored policy approach to different groups of individuals, which may be more successful at eliciting pro-environmental behaviour change than general "one-size-fits-all" policy interventions. The typology tools constructed in this study create a refined, targeted approach to understanding the nuances of consumption behaviours.

Work package 2, "CONSENSUS HomeLabs", identified concrete interventions from the promising practices and transitions frameworks (developed in Phase I of CONSENSUS) to test and evaluate their impacts within households. Over a 5-week period, CONSENSUS researchers – acting as intermediaries – introduced a suite of complementary interventions (i.e. products, devices, information and simulated regulatory initiatives) to households in order to test their efficacy in re-orienting eating and washing practices. Ethnographic research collated responses of the households to these interventions and noted changes in consumption practices. Typologies of respondents for eating and washing practices were generated from the results. Households were revisited after 6 and 12 months to establish the extent to which initial changes implemented during HomeLabs endured once the motivating presence of the research visits ceased. The results of HomeLabs illustrate the variegated experiences and practices of households, as well as highlighting the challenge of habituating practice change. Results indicate the benefit of combining and aligning supports that relate to rules, tools, skills and understandings.

Work package 3, "Mobility Biographies", built on research conducted in the first phase of CONSENSUS and revealed variations in the "consumption of distance" across the life course. CONSENSUS II mapped individuals' mobility biographies using an innovative survey tool deployed across the island of Ireland. In order to identify potential "windows of opportunity" for behaviour change, particular attention was given to the impact of

major life events (such as moving home, starting college or changing jobs) on people's travel habits. The focus of this research was complemented by work on "mobility milestones", i.e. events in people's lives that are primarily mobility-related and depend upon favourable socio-political, economic and infrastructural conditions. Examples of mobility milestones include getting a driving licence or buying a car or bicycle. A cohort analysis of survey results, combined with socio-historical transport research, found that although life events and mobility milestones can transform individuals' travel habits, car use has become increasingly entrenched over time through investment in road infrastructure and pro-car policies and laws.

Involving researchers from Trinity College Dublin, the National University of Ireland, Galway, and Ludwig-Maximilian University of Munich (Germany), CONSENSUS II has brought global attention to Ireland as a site of innovation in the realm of sustainable consumption research. Research findings have been published in leading interdisciplinary journals and have been presented both nationally and internationally. CONSENSUS approaches have also been replicated by research teams across the Atlantic.

1 CONSENSUS II: An Introduction

Global reports examining the state of the planet indicate declining quality and quantity of finite environmental resources and increased environmental pollution. Most starkly, the 5th Global Environmental Outlook states that the "currently observed changes to the Earth System are unprecedented in human history" (UNEP, 2012, p. 6). As established by the CONSENSUS (Consumption, Environment and Sustainability) research programme 2009–2013 (Davies *et al.*, 2010, 2014b, 2015a), while attempts have been made to address environmental changes, current interventions have not succeeded in reversing them. Indeed, the United Nations Environmental Programme (UNEP, 2010) notes that neither the scope nor the speed of environmental changes have abated since 2008. Extrapolating current trends, it is clear that the impacts of a globalised growth-based economy combined with a growing population will accelerate the consumption of natural resources, potentially breaching thresholds in Earth systems and leading to abrupt and possibly irreversible changes to fundamental life-support functions. It has been argued that this could lead to a perfect storm of pressures on the environment and society where increasing demands for food, water and energy may unleash public unrest, cross-border conflicts and mass migration.

While the exact profile of societal impacts from continued unsustainable development is unclear, accelerating environmental changes will have significant and adverse implications for human and planetary well-being. In the culmination of its findings, CONSENSUS presented the case for addressing the governance failures in the field of sustainable consumption, both in Ireland and internationally. In particular, evidence was presented that supported a shift from a narrow focus on the symptoms of individual unsustainable consumption (and the resultant environmental pressures) to consider the complex underlying drivers that shape consumption practices and their adoption by different groups in society (Davies *et al.*, 2014b). In light of this, the overarching aims of the second phase of CONSENSUS were to further advance understanding of the underlying drivers of consumption, to identify tailored approaches for different groups in society at different life stages and to generate novel technology, education and policy recommendations following the testing of interventions for sustainable water and food consumption in real-life settings.

This synthesis report summarises the innovative and ground-breaking research that has been conducted as part of the second phase of the CONSENSUS project between 2014 and 2015. CONSENSUS II provides a coherent and important extension of the original CONSENSUS research programme that sought to understand the context in which current (un)sustainable trends and behaviours occur and clarify what an alternative co-designed, desirable and sustainable future might look like. While the first phase of CONSENSUS identified a suite of governance, lifestyle and sectoral challenges relating to consumption, CONSENSUS II comprised three complementary work packages (WPs) to progress understanding of the underlying drivers of consumption and identify opportunities to leverage change. CONSENSUS II specifically focused on a detailed segmentation analysis of the CONSENSUS Lifestyle Survey, the development and implementation of HomeLabs, and collection and analysis of mobility biographies data through an innovative online survey developed specifically for this project. These techniques represent emergent areas of academic enquiry and some background to their formation is presented below. A detailed explanation of the ways in which these approaches were designed and implemented in CONSENSUS II is provided within the remaining chapters of this synthesis report.

1.1 Segmenting for Sustainability on the Island of Ireland

Segmentation[1] analysis has been heralded as a new framing device which can help to address the challenge of sustainable consumption and lifestyles (Barr *et al.*, 2011; DEFRA, 2011). The ability to recognise which segment of society a person belongs to in terms of their consumption behaviours and attitudes is vital to being able to critically examine tailored policy or

1 Segmentation involves subdividing the public into manageable groups based on the attributes they possess, e.g. their social status, their attitudes or their dominant behaviour.

interventions (DEFRA, 2006). Sustainable consumption policy has, to date, tended to ignore the employment of tailored or focused initiatives, instead opting for a "one size fits all" approach to behaviour change (SEI, 2009; Lavelle *et al*., 2015). Segmentation provides a richer redefinition of the key target audiences and hence enables policymakers to develop more effective strategies that are closely aimed at addressing certain identified segment groupings. For example, communication strategies, economic initiatives or pricing incentives can be designed to address specific needs of each grouping. Segmentation enables policymakers to focus or tailor future policy implementation according to which segment of the population they wish to influence. The use of segmentation methods also enables cross-group comparisons between different segment groupings on a range of consumption issues. For example, segmentation analysis can indicate which groups are actively seeking to influence their friends and family to be more environmentally friendly, or which ones are most hesitant about increased environmental taxes and levies.

Social research has shown that lifestyle groupings can be identified on the basis of sharing objective traits (e.g. socio-demographic variables) and subjective traits (e.g. interests, attitudes and opinions) with respect to their tendency towards environmentally friendly lifestyles (Spaargaren and Van Vliet, 2000; DEFRA, 2008). The underlying assertion is that the majority of segmentation groupings are context-specific and are developed for particular practical applications (Sharp and Darnton, 2006). For example, the segmentation model has been used in the UK to help develop more targeted approaches to policy and marketing communications, particularly in relation to the key sectors which have a significant impact on the environment. Used in conjunction with wider evidence, segmentation models have been employed by agencies such as DEFRA (Department for Environment, Food & Rural Affairs) in the UK to assess which groups of people might be more willing and/or able to undertake certain pro-environmental behaviours, which groups of individuals may be most opposed to certain behaviour changes and what the specific motivations and barriers for uptake of such behaviours are. Such an understanding could then identify which behaviours have segment-specific potential, as well as provide guidance regarding the types of interventions that may be more or less effective for specific segments.

In terms of policy development and road-mapping for sustainability, as noted above, recommendations are clearly required based on the need to stimulate drivers and overcome barriers to change. Acknowledging the existence of heterogeneity in consumption behaviours, specific studies (e.g. Barton *et al*.'s 2013 study of energy use) have analysed large datasets with the intention of uncovering underlying patterns that describe different segments of the population with regard to their consumption patterns and have developed robust sets of policy recommendations as a result.

1.2 Living Laboratories: CONSENSUS HomeLabs

The living laboratory ("living lab") methodology relates to research approaches that typically combine user-centred and open innovation processes to generate and prototype new concepts, followed by implementing and evaluating these in real-life settings (Salter and White, 2013). Living labs are therefore considered both a methodology and a concept, as they are rooted in trends for participatory design and collaborative innovation (Scott *et al*., 2009) and are often focused around new technology development. In recent years, there has been a proliferation of living labs established with the aim of advancing solutions for sustainable household living through the identification of new products, devices and architecture that might support this. Such experiments often focus on identifying solutions for energy efficient technologies and advanced information technology (IT) systems to encourage better resource management and to enhance personal health and well-being within the home. The living lab at Massachusetts Institute of Technology (MIT), established in 2003, is often referred to as one of the first examples and was designed with the stated intention of sensing, prototyping, validating and refining complex solutions in simulated real-life contexts. Other notable examples include Philips' "Home Lab", "Experience Lab" and their recently launched "InnoHub". The latter allows academic and business partners to have access to the company "home simulator" lab, which is overseen by Philips' consultants to fine-tune new product and technology prototypes (Salter and White, 2013). Activity has thus proliferated in this area to such an extent that the European Network of Living Labs (www.openlivinglabs.eu) now has some 300 registered living labs across Europe and worldwide, which are committed to sharing

knowledge and improving co-operation. Co-operation is paramount within the context of research and action for deliberative environmental governance and system innovation for sustainable consumption. While greater distinction was once apparent between either academic-led or commercial-led living labs, this is lessening as an ethos of collaboration and multi-stakeholder engagement in innovation processes is becoming more pervasive. Involvement of cross-sectoral representatives from small and medium-sized enterprises, large corporations, public sector agencies, non-governmental organisations (NGOs) and citizens is often visible throughout the typically identified four key phases of living labs, which are (1) co-creation, (2) exploration, (3) experimentation and (4) evaluation.

Living labs take many forms and have been applied in many different settings. With respect to sustainable consumption, they have been applied within the general sustainability arena, energy and water consumption, but primarily from a technology-driven perspective. Beginning with co-creation, a fundamental feature of living labs is the focus on "user as partner" rather than "user as subject" in terms of design. Such a paradigm is founded on the view that high-levels of user input can develop creative, impactful and more empathetic interventions suited to user needs, contexts and experiences. Co-creation processes may involve using, for example, observation and visioning techniques, such as those employed during the initial phase of CONSENSUS (see Doyle and Davies, 2013; Salter and White, 2013). These processes are in line with the shift from closed, technology and market-led paradigms of innovation to models that are reflective of modern systemic challenges of sustainability. For example, large corporations who typically had closed research and development (R&D) processes now develop open innovation contests to crowdsource ideas from the public and other corporations, such as Sony and WWF's "Open Planet" programme or Unilever's "Sustainable Living Lab" project. Phase I of CONSENSUS, through its participatory backcasting work, successfully completed the first two phases of a living lab process: co-creation and exploration. Crucially going beyond technology-driven strategies of behaviour change in the home, CONSENSUS II took this unique opportunity to explore, develop and evaluate the novel concept of practice-oriented living labs through prototyping and evaluating those promising practices developed by CONSENSUS I for sustainable washing and eating. In this research, technologies were considered not only for their functional capabilities but also for their transformative potential, as "assistors" in encouraging more sustainable washing and eating expectations, goals and skills. This research extended debates on practice-oriented design and the possibilities for the deliberate inscription of normative sustainability goals (e.g. optimum levels of cleanliness or frequency of washing) in both material and non-material components of daily consumption practices.

1.3 Mobility Milestones and Biographies

Economic, social and cultural changes have fuelled the demand for freight and personal mobility worldwide. Europeans are moving further and faster than ever before, with passenger kilometres having increased by roughly 1.5% per annum between 1995 and 2007 (EEA, 2012). Despite a slight drop in demand for transport during the recent recession, trends towards longer distances and a car-centric modal split in private transport persist. In Ireland, reductions in fuel consumption and CO_2 emissions through improved engine technology and fleet rejuvenation have been negated by increases in car ownership and use. The rapid expansion of transport infrastructure during the "Celtic Tiger" era (1995–2007), most notably through road construction, has further fuelled car-based mobility demand, with greenhouse gas emissions from transport showing the fastest increase of all sectors (EPA, 2015; Rau *et al.*, 2015).

Life events and life-course transitions can dramatically impact on people's consumption practices. Understanding the role and significance of such "tipping points" in people's use of resources over the life course can significantly advance our understanding of current patterns of (un)sustainable consumption and how to transform them. There is ample evidence that key life events (e.g. arrival of first child, relocation, transition from school or university to the workplace, retirement) coincide with more or less dramatic change in consumption patterns (cf. Schäfer *et al*., 2012). As Jaeger-Erben (2013) showed, life events such as the arrival of a first child or relocation to a new city can drastically transform how people shop, travel or cook. This also confirms findings from transport research that demonstrate diverse effects of childbirth on parents' travel practices (Lanzendorf, 2003).

Recent calls in social-scientific and interdisciplinary sustainability research communities for the theoretical and methodological advancement of longitudinal and life-course approaches mirror these empirical findings (e.g. Lanzendorf, 2003; Jaeger-Erben, 2013; Rau and Edmondson, 2013). A growing emphasis on life events also ties in with recent calls for more longitudinal research on sustainability questions (cf. Rau and Edmondson, 2013). For example, Heisserer (2013) offers convincing arguments that our understanding of why people's mobility practices change remains patchy. Similarly, Lanzendorf's (2003) observation that "travel behaviour research until now has been limited in its ability to understand individual's behavioural changes" (p. 1) continues to remain highly relevant.

Transport research conducted in CONSENSUS I revealed variations in the "consumption of distance" across the life course. Subsequently, CONSENSUS II examined individuals' mobility biographies using an innovative survey tool deployed across the island of Ireland. Focusing on the impact of major life events, such as moving home, starting college or changing jobs, on people's travel habits, WP3 identified potential "tipping points" and opportunities for change. This was complemented by work on what we term "mobility milestones', i.e. events in people's lives that are primarily mobility-related and depend upon favourable socio-political, economic and infrastructural conditions. These include getting a driving licence or buying a car or bicycle. A cohort analysis of mobility biographies data, combined with socio-historical transport research, was undertaken to establish if and how life events and mobility milestones can transform individuals' travel habits. Moreover, throughout this study, there was an explicit focus on the evolution of car use over time, paying particular attention to investment in road infrastructure and pro-car policies and laws. Based on the scientific findings generated, WP3 produced a set of policy recommendations for improving sustainability in transport.

1.4 Contribution to Knowledge

CONSENSUS II contributes to ongoing policy discussions and developments at a global, European and national level. In particular, CONSENSUS II adds to global debates resulting from the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012 (Rio+20), including the appropriate formation of the Sustainable Development Goals and Guidelines for Green Economy policies. More specifically, Rio+20 reaffirmed its commitment to promoting sustainable patterns of consumption and production as one of the three overarching objectives of, and essential requirements for, sustainable development. It also reiterated that in order to achieve global sustainable development, fundamental alterations to the way societies consume and produce are imperative. At Rio+20, Heads of State strengthened their commitment to this arena with the adoption of the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns (10YFP). Paragraph 226 of the Rio+20 outcome document *The Future We Want* (UNEP, 2012) states that, *"*[f]undamental changes in the way societies produce and consume are indispensable for achieving global sustainable development. All countries should promote sustainable consumption and production patterns, with the developed countries taking the lead and with all countries benefiting from the process, taking into account the Rio principles."

In particular, CONSENSUS II feeds its results directly into the Global Sustainable Consumption and Production (SCP) Clearinghouse set up by UNEP to outline actions for a more sustainable future. The initiative aims to encourage SCP knowledge-sharing and co-operation in response to the current unprecedented strain on natural resources. The initiative has already attracted 800 new members, including CONSENSUS, from 500 organisations in 100 countries worldwide, and acts as a central hub for experts to foster and strengthen partnerships through a co-operative marketplace, working groups and forums. Similar to the structure of CONSENSUS II, the SCP Clearinghouse uses social networking to promote knowledge-sharing, and bringing governments, businesses, researchers, civil society and the wider SCP community together to exchange ideas and experiences on sustainability issues, ranging from public procurement and production to education and lifestyles.

At a European level, CONSENSUS II provides case study data vital to the overarching Europe 2020 Strategy, particularly as is detailed in the *Roadmap to a Resource Efficient Europe* (EC, 2011). This roadmap focuses on improving the overall environmental performance of products, promoting the manufacture of sustainable products and encouraging demand for sustainable goods. Specifically, it informs evaluations

of the Integrated Product Policy and the Ecodesign Directive (2009/125/EC), which aims to reduce the environmental impacts of products, including their energy consumption, across their life cycle. Meanwhile, in February 2012, the European Commission began consultation to update the EU Sustainable Consumption and Production Action Plan (SCP AP), with a view to develop improvements to resource efficiency, product and service impact analysis, and labelling. Through its work on testing novel products and lifestyle supports, CONSENSUS adds empirical foundation to such future improvements. In addition, members of the CONSENSUS team are actively involved with international networks of researchers on sustainable consumption and production, with team members present on the Steering Committee for SCORAI-EU (European Sustainable Consumption and Research and Action Initiative) and the Board of the European Roundtable on SCP.

At a national level, *Our Sustainable Future* (DoELG, 2012) calls for a decoupling of environmental degradation and resource consumption from economic and social development. It also accepts that the "business as usual" approach will not suffice. Specifically it states that:

> we require a major reorientation of public and private investment, particularly in terms of innovation, research and development in those areas where we need radically new approaches. We need a more developed "green economy" focus, achieving a more mutually supportive interface between environmental protection and economic development, while also ensuring that our approaches are socially sustainable. *Our Sustainable Future* is premised on this and the measures contained within it are designed to position us firmly on the desired path (DoELG, 2012, foreword).

While some governmental actions, including the extension of environmental taxation and awareness campaigns, have emerged since 2008, most policy development has been a reaction to external forces. In particular, the demands of the troika (i.e. International Monetary Fund, European Central Bank and European Commission) have been dominant during the period of intense austerity between 2010 and 2013. Equally, the bulk of these actions are focused on cleaner production or waste prevention policy. Attention to the consumption element of the equation is underdeveloped and so the interconnections between production, consumption and disposal have historically tended to be lost in governing approaches. CONSENSUS II provides novel and important empirical data on what it means to consider these issues more holistically through the analytical lens of the household.

1.5 Summary

To reverse that which is unsustainable requires the introduction of innovative measures consistent with a vision of, and pathway towards, sustainability. Initiating such a transition will undoubtedly require a diverse array of measures to (1) strengthen the sustainability mindset within society; (2) recalibrate the rules and regulations to incentivise more sustainable practices; (3) foster the development of more adaptive governance systems; and (4) support investment in sustainable technologies (UNEP, 2012). CONSENSUS II, with its "beyond resource efficiency" standpoint and strategic collaborations with leading change makers from public, private and civil society and householders, has assisted in the formation, monitoring and evaluation of innovative measures to reduce the negative impacts of overconsumption. As illustrated in the remainder of this report, CONSENSUS II has made a timely and highly relevant contribution to global sustainable consumption debates by bringing together exploration, co-creation, experimentation and evaluation. Chapter 2 provides an outline of the methods and outcomes of WP1, "Segmenting for Sustainability on the Island of Ireland", which focused on a segmentation analysis of *Lifestyle Survey* data that was collated as part of CONSENSUS Phase I. Chapter 3 explains the novel living lab methodology that formed WP2, called CONSENSUS HomeLabs, as well as the high-level findings that focused on washing and eating practices. Chapter 4 presents the approach and findings of WP3, exploring changes in mobility practices across the life course. Chapter 5 details key high-level findings of CONSENSUS II and summarises the impact highlights of the three WPs; the chapter also describes a research agenda to draw further attention to sustainable consumption in Ireland.

2 Segmenting for Sustainability on the Island of Ireland

2.1 Key Issues

Social marketing and segmentation analysis techniques behaviour change strategies are one approach to behaviour change that can be used to complement regulatory, educational, communication and other efforts that seek to promote more sustainable consumption (DEFRA, 2011). A segmentation model allows its user to identify clearly differentiated groups within a broad audience and to understand the most effective means by which to engage those groups. As no "one size fits all" approach exists, it is important to analyse and categorise in which ways and to what extent different segments of consumers can contribute to a more sustainable world. The identification of consumer segments has been highlighted as one of the important and necessary avenues of research needed in the field of sustainability (Davies *et al.*, 2014b).

2.2 Method

The CONSENSUS II WP1 aimed to contribute to local and national policy development by building capacity to introduce targeted sustainable consumption policies across the island of Ireland. This study explored and promoted greater understanding of different segment groupings of individuals and identified potential nuances between socio-demographic characteristics of each grouping, as well as differences when taking specific consumption behaviours in the areas of food, water, transport and energy consumption into account. This 18-month study was conducted over several phases and produced a number of significant outputs.

The first phase involved an in-depth review of the CONSENSUS baseline data and produced a policy report encompassing a comparative study across the case-study regions (Galway, Dublin and Derry/ Londonderry) with a focus on the two distinct policy contexts: Northern Ireland and Ireland. The report, by Lavelle and Fahy (2015a), centres on the consumption of energy and water in the domestic sphere of the household as well as on the "consumption of distance" as three key areas which currently impact negatively on the environment across Northern Ireland and Ireland. This analysis is a unique feature of the CONSENSUS research project in that it explores attitudes and behaviours in an all-island sampling frame. Exploring consumption across two policy regions is an ambitious goal and the research produced some very significant and novel data for the two regions, as well as identifying the challenges of conducting cross-border research. The findings presented in the report are informative and provide important implications for policymakers on the promotion and uptake of sustainable consumption behaviours and lifestyles.

The second phase of WP1 included a desktop review of good practice and evidence with regard to social marketing methods and segmentation techniques across different policy contexts, both nationally and internationally.

During the third phase of WP1, the researchers constructed and tested an innovative typology of environmental attitudes and pro-environmental behaviour using empirical data from the all-island survey on household consumption and lifestyles. This study examined the need to disaggregate pro-environmental behaviour into habitual and occasional behaviour. The former captures routine everyday activities such as regularly buying organic food or habitually conserving water whereas the latter describes occasional or once-off activities such as installing insulation and purchasing energy-efficient household appliances. Subsequently, the fourth phase, and a central outcome of CONSENSUS II, of WP1 was the identification of two innovative typologies of consumers according to their reported undertaking of different temporal elements of pro-environmental behaviour (i.e. habitual and occasional). This was accomplished through the employment of extensive exploratory and factor analysis of large scale CONSENSUS data on environmental attitudes and behaviours.

The fifth phase identified and profiled these lifestyle segment groupings and unpacked the potential nuances between socio-demographic characteristics of each grouping (e.g. gender, age, education, income, location and housing tenure status). A comparative analysis of attitudes and behaviours (specifically habitual and occasional actions) concerning sustainable behaviours and lifestyles was conducted across eight different

segments. Two policy documents (Lavelle and Fahy, 2015b,c), as well as numerous academic outputs, were produced from WP1 (see Appendix 2).

2.2.1 Summary of typology development

This study employed a quantitative research design to investigate attitudes and environmental behaviours. A survey instrument – the CONSENSUS *Lifestyle Survey* – was developed to capture large-scale data on attitudes and behaviours from 1500 people residing in urban and rural areas in Northern Ireland and Ireland, namely Galway, Derry and Dublin. This research produced the largest dataset to date on attitudes and environmental behaviours in an all-island Irish context.

Respondents in this study were asked to indicate which habitual behaviours (such as reducing energy use in the home, cutting down water use, avoiding products with excess packaging, buying reusable products instead of disposable ones and repairing items rather than buying new ones) they had undertaken in the past month. Respondents were also asked whether they had undertaken a number of occasional actions (such as installing insulation, switching to a renewable energy supplier, purchasing an energy efficient product) in the 5 years prior to being surveyed.

This research devised a typology instrument to identify groupings of respondents according to their attitudes and behaviours towards consumption and lifestyles in an all-island Irish context. Two separate performance indices were created based on habitual and occasional behaviour items from the survey data in order to develop two typology tools. For the purposes of developing each typology, one behavioural scale was utilised at a time in conjunction with the "attitudinal scale". Scoring on these two behavioural indices enabled respondents to receive a total behavioural score on each of the two types of behaviours discussed.

Two typologies of consumers were identified based on occasional and habitual behaviour and pro-environmental attitudes, and four groupings were classified under each of the two typologies. Based on the results of exploratory factor analysis and the application of cut-off criteria to produce two groups for each of the three scales (respondents with scores below threshold vs those with scores above and at the threshold), eight different groups of consumers were constructed. The four groups in the occasional behaviour typology (typology 1 in Figure 2.1) were labelled as: "Dark Greens", "Browns", "Light Greens" and "Yellows". Regarding habitual behaviour, four different labels were used: "Ever Greens", "Aspiring Greens", "Accidental Greens"

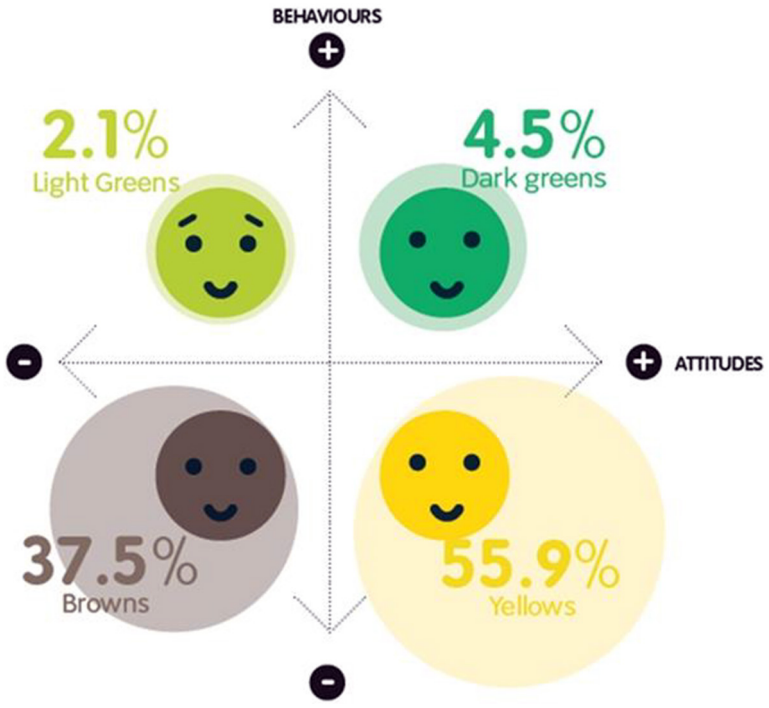

Figure 2.1. Overview of four groupings in typology 1: occasional behaviour.

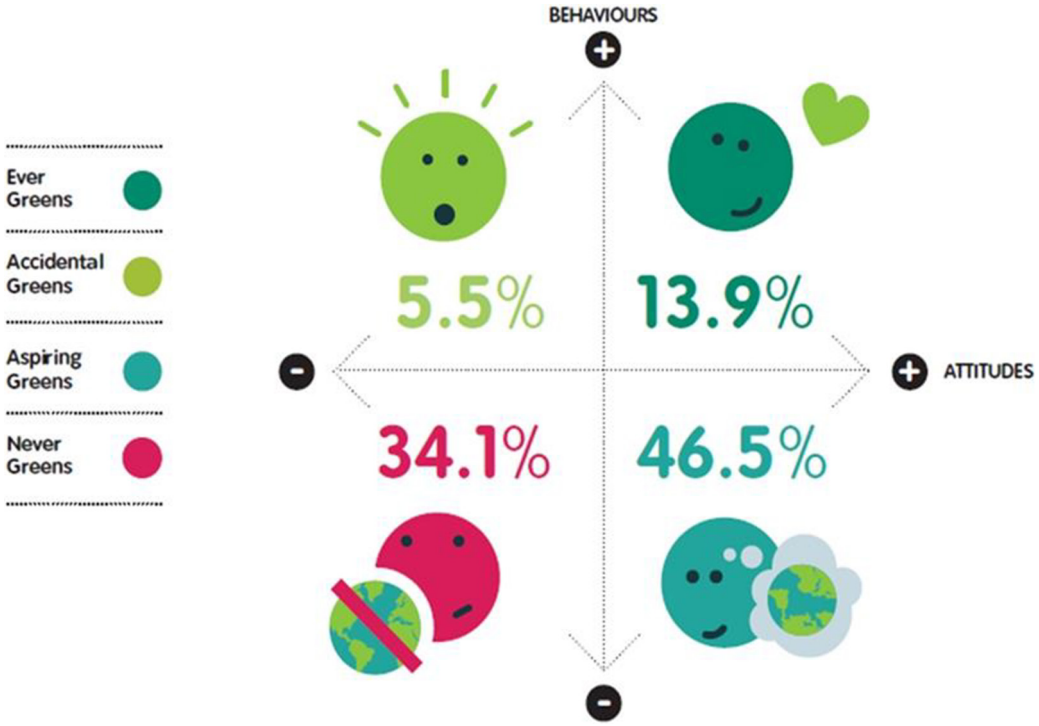

Figure 2.2. Overview of four groupings in typology 2: habitual behaviours.

and "Never Greens" (typology 2 in Figure 2.2). As overviewed below, a number of key emerging trends or patterns were observed in individuals' responses according to varying socio-demographic variables such as age, gender, income and education.

2.2.2 Typology 1

Our results illustrate the ability to construct four categories of consumers from CONSENSUS Lifestyle Survey data, based on expressed attitudes and reported occasional behaviour. Based on respondents' ability to obtain scores above certain thresholds concerning their reported exhibition of green–brown occasional behaviours and their expressed green–brown attitudes, four categories of consumer were identified (see Figure 2.1).

To summarise, these categories are: Dark Greens, Browns, Yellows and Light Greens. Figure 2.1 shows these four groupings positioned along an attitude–occasional behaviour continuum. Individuals in the Browns category had the lowest mean age (43) across the four groupings, whereas respondents in the Light-Greens grouping had the highest mean age (47). Yellows and Light Greens were more likely to be homeowners (83% and 78%, respectively). Dark Greens and Light Greens reported the highest mean number of residents (3.18 and 3.3, respectively). Individuals in the Yellows grouping had the lowest average number of persons (3.11) per household. The Browns grouping had the lowest percentage of respondents who had attained third-level education (47%), whereas respondents in the Dark-Greens category had the greatest number of respondents with third-level education (69%). A slightly greater percentage of Dark Greens and Yellows resided in rural locations (57% and 54%); in contrast, a greater number of Browns and Light Greens resided in urban areas (57% and 47%). A greater number of the Browns grouping (46%) reported a net household income of less than €37,999 per annum after tax and deductions. A greater number of Dark Greens (7%) and Light Greens (5%) reported earning somewhere in the highest income cohort listed on the survey (i.e. >€114,000 per annum).

Examples of consumption behaviour profiles of groupings in typology 1: occasional behaviour

Water and energy use

Dark Greens (49%) were the most likely group to agree that they had reduced their water use in the past month for environmental reasons. Dark Greens and Light Greens (i.e. groups who displayed green behaviours) were more likely to agree that they did not have a right

to use as much water and energy as they wish (75%) compared to the two groups who displayed Brown environmental behaviours (i.e. Yellows and Browns; 53%).

Energy reducers

Dark Greens were the biggest energy reducers, with 57% of the group stating that they cut back on energy use in the home in the past month for environmental reasons. Browns were the smallest energy reducers, with 37% of this grouping stating that they had cut back on energy use in the home in the past month for environmental reasons.

Purchased an energy-efficient appliance

The vast majority of Dark Greens (96%) reported purchasing an energy-efficient appliance in the past 5 years. Less than half of Yellows (45%) had reported purchasing an energy-efficient appliance in the past 5 years. This was the second highest figure, although drastically lower than Dark Greens (96%). Light Greens were the least likely group (32%) to report purchasing an energy-efficient appliance in the past 5 years.

Switched to a renewable energy supplier

Light Greens were the most likely group (84%) to report changing to a renewable energy supplier in the past 5 years, while Yellows (18%) and Browns (15%) were the least likely groups to report switching to a renewable energy supplier during the same period.

Purchasing behaviours

A greater number of respondents in the Dark-Greens group reported that they avoided purchasing goods with excessive packaging (37%). Light Greens (34%) and Dark Greens (33%) were most likely to report repairing items rather than purchasing new ones. Light Greens (44%) were the most likely group to report shopping or paying a bill online. Light Greens (69%) were most likely to report purchasing reusable rather than disposable items. Browns were least likely to report undertaking pro-environmental purchasing decisions. For example, in the Browns group, only 21% reported avoiding purchasing goods with excessive packaging; 47% reported purchasing reusable rather than disposable items; 20% reported repairing items rather than purchasing new ones; and 30% reported shopping or paying a bill online.

2.2.3 Typology 2

Four categories of consumers were also constructed based on expressed attitudes and reported habitual behaviour. Figure 2.2 shows these four categories of consumers positioned along an attitude–habitual behaviour continuum. To summarise, these four categories are: Ever Greens, Accidental Greens, Aspiring Greens and Never Greens.

The Never-Greens group had the lowest mean age (43 years), whereas respondents in the Aspiring-Greens group reported the highest mean age (46 years). There were substantially more females in the Ever-Greens group (63%) and in the Aspiring-Greens group (62%) than in the other two groups. The Ever-Greens and Accidental-Greens groups tended to have a lower mean number of residents residing in their home (3.05 and 2.93, respectively), in comparison to the Never Greens (mean = 3.19) and Aspiring Greens (mean = 3.13). The Aspiring-Greens group had the highest proportion of homeowners (77%). The Ever-Greens group had the largest percentage of renters (28%) and also the greatest number of individuals with third-level education (65%). The Accidental-Greens group had the highest percentage of unemployed people (13%). The Accidental-Greens and Aspiring-Greens groups had the highest percentage of retired respondents (20% and 19%, respectively). While a greater number of Ever Greens and Aspiring Greens resided in rural locations (52% and 55%), Never Greens and Accidental Greens respondents were slightly more likely to reside in urban areas (56% and 59%). In terms of income, Never-Greens and Accidental-Greens appeared to have the highest percentage of respondents who reported earning less than €37,000 total household net income per annum in the past year (45% and 47%, respectively). Aspiring-Greens and Accidental-Greens groups comprised the greatest percentage of respondents who earned >€114,000 net household income per annum (both 4%). Examples of Consumption Behaviour Profiles of typology two (i.e. habitual behaviours) indicated that in terms of commute, Ever Greens demonstrated the highest percentage of individuals who walked to work, school or college (8%), the highest percentage of cyclists (11%) and the lowest proportion of car users (44%) for the same commute.

Examples of consumption behaviour profiles of groupings in typology 2: habitual behaviour

Transport

Aspiring Greens (i.e. those individuals who were classified as green in terms of attitude but brown in terms of their behaviour) reported the lowest level of walking (6%), cycling (4%) and public transport usage (5%) across the four groupings. Aspiring Greens reported the greatest levels of car use (either as driver or passenger) (53%) for their commute to work, school or college.

Food

Awareness of food production methods was quite mixed across the four groups. Ever Greens (83%) were the most likely group to pay attention to where and how their food is produced. In contrast, Never Greens (54%) were the least likely group to pay attention to where and how their food is produced.

Eco-labels

Ever Greens (71%) and Aspiring Greens (74%) were more likely to trust eco labels, in comparison to Never Greens (58%) and Accidental Greens (52%). The majority of Ever Greens (94%) reported that there is a need to save water, compared to 72% of respondents in the Browns group. Browns (77%) were most likely to agree that "organic and fair-trade food is too expensive to buy", in comparison to 56% of Ever Greens.

An extensive overview of the full profiling of all groupings is available in the full report (see Lavelle and Fahy, 2015a). The profiling was based on socio-demographic characteristics, as well as differences across the groupings in relation to four areas of consumption studied: water, transport, food and energy consumption.

2.2.4 Differences between the typologies

Considerable differences exist between the two behaviour groups with regard to key socio-demographic variables such as employment status, income, residential location and housing tenure. For example, respondents who are less well-off and have lower educational attainment are more likely to report everyday habitual activities such as buying reusable items, saving water and energy, and repairing faulty gadgets and appliances rather than discarding them. This suggests that some of this habitual behaviour may be due to financial necessity rather than deliberate choice.

In contrast, better-off respondents with a higher educational status were more likely to report engagement in occasional "green" behaviour such as retrofitting the house or purchasing an energy-efficient household appliance, all of which require a much higher financial commitment at a single point in time. In line with recent research findings (see Martinsson *et al.*, 2011), (infra) structural and cultural factors can be expected to play a significant role in green behaviour.

2.2.5 Exposing the true greens

Having extensively profiled the "green" acting respondents in typology 1 and 2, CONSENSUS concludes that relatively little overlap exists between those respondents categorised as "green" based on their occasional behaviours (7%) and those individuals who are categorised as "green" acting in relation to their habitual behaviours (19%). Only 35 of respondents (2.3% of the total sample) who were classified as "green" according to their occasional behaviours also engaged in "green" habitual behaviours. We term this very small group of "green-acting" individuals as "True Greens". A thorough descriptive analysis of the True Greens found that there were more women (n = 20, 57%) than men (n = 15, 43%) in the group. The majority of True Greens attained third-level education (n = 24, 71%). This group comprised predominantly homeowners (n = 25, 76%), followed by renters (n = 6, 18%) and finally those respondents who resided in their homes rent-free (n = 2, 6%). The majority of True Greens were employed (n = 14, 40%), with 20% comprising the category "other" (n = 7), 17% retired (n = 6) and equal numbers of students and unemployed individuals (both n = 4, 11%).

Given the differences in the composition of the "green" acting and "brown" acting groups across the two typologies (i.e. occasional and habitual behaviour), the results would suggest that a distinction needs to be made between habitual and occasional pro-environmental behaviour.

2.3 Summary and Recommendations

The findings of WP1 (detailed further in the full reports) clearly illustrate the heterogeneity and richness of pro-environmental behaviour, thereby challenging much existing research that treats different types of

"green" behaviour as part of the same phenomenon. In an attempt to unpack "pro-environmental behaviour" as a category, this report examines two distinct types of actions – habitual everyday behaviours and occasional actions – and presents evidence for their distinct characteristics and capturing variations between respondents who reported them. Results of this report show that in order to increase pro-environmental behaviours, a tailored policy approach to different groups of individuals may be more successful than general policy interventions for all.

This research is innovative in its segmentation approach and method as it utilised two temporal behavioural indices to construct groupings of respondents. The research dismantled the notion that pro-environmental behaviours are uniform in character. Instead, the development of two scales, the first based on habitual everyday pro-environmental behaviours and the second on occasional behaviours, permitted greater insight into respondents who undertook each type of action. As is detailed in the full reports, segmentation approaches to pro-environmental behaviour change are not without their shortcomings.

This report has major implications for changing consumption behaviour. The act of thinking about target groups will itself make a difference to the way in which sustainability campaigns are designed and implemented. Instead of treating society as one homogenous group and trying to find the perfect model for the whole population, this approach focuses on identifying subgroups that have experienced a comparable set of events and, subsequently, it has significant potential to further advance our understanding of pro-environmental behaviours.

The policy relevance of the findings presented in this report cannot be overestimated. There is clearly a need for all policy actors to recognise the complex, multi-layered nature of pro-environmental behaviour. Using an innovative segmentation approach that focuses on the identification of different behaviour types and diverse groups of people, our research succeeds in demonstrating the characteristics of different groups of respondents who undertake either one of these behaviour types, or both. This opens up new avenues for the development of sustainable consumption interventions that are tailored to particular population groups and that depart from "one-size-fits-all" approaches that have hitherto dominated sustainable consumption policy in Ireland and the rest of Europe.

Given the urgency of many current sustainability challenges and the limited effectiveness of many policy initiatives to date, our efforts to promote a more nuanced understanding of "pro-environmental behaviour", especially in key consumption sectors such as energy, water and mobility, seem timely.

Importantly, results of WP1 research reveals the strong impact of socio-demographic factors on people's ability to behave more sustainably, thereby highlighting the need to take seriously the close interconnections between social justice and environmental protection. Existing sustainable consumption policy that is largely insensitive to socio-demographic differences, including differences in income, educational attainment and housing tenure, is likely to miss its objectives and to leave social inequalities unaddressed, or potentially exacerbated.

WP1 researchers recommend that future sustainable consumption policy incorporates social-scientific evidence, such as the findings presented in this report to ensure that social and environmental sustainability goals are given equal weight. There is a clear need for multi-faceted policy approaches to promote environmental behaviours, involving an instrumental mix of policy tools at multiple levels with various actors, and which draw on a full range of policy and communications tools. Tools can and should be combined across policy and communication spectrums. Policy approaches need to acknowledge the crucial role of human choice in terms of implementing sustainable technologies and changing unsustainable consumption patterns.

Overall, this research has produced valuable evidence and data that highlight a need and demand for greater governmental action and investment in relation to efforts to promote sustainable consumption and lifestyle.

3 HomeLabs: Experiments in Sustainable Living

3.1 Introduction

The aim of the HomeLabs WP was to identify concrete interventions from the promising practices and transitions frameworks developed in the first phase of CONSENSUS and to introduce them into households over a 5-week period in order to test and evaluate the impacts on household consumption practices. The approach developed, entitled HomeLabs, is a variant of the living labs methodology (Salter and White, 2013). These living labs typically combine user-centred and open innovation processes to generate new concepts that are then implemented and evaluated in real-life settings. In recent years, the establishment of such living labs has proliferated in order to advance solutions for sustainable living by identifying new products, services, policies and behavioural innovations that might support more sustainable lifestyles. The approach allows for the iteration and improvement of ideas and has the ultimate goal of mainstreaming successful innovations. Living lab experiments are burgeoning internationally with increasing examples of collaborative efforts between commercial, government and academic partners operating in diverse settings and at different scales. A selection of these approaches were identified in a CONSENSUS briefing note "Change Labs: Sites for Experimentation for Sustainable Living" (Devaney *et al.*, 2014). Despite this diversity, living labs often share some key characteristics as detailed in Table 3.1.

Living lab methodologies have been adopted worldwide, with fruitful results for identifying solutions to complex societal challenges, varying from sustainable resource use to community well-being. By generating pivotal user feedback, the most successful experiments balance the fine line between radicalism and reality to create implementable yet innovative results (Mulgan, 2014). The flexibility that living labs offer to experiment with radical innovations in controlled environments prior to mainstreaming, and the inherent learning processes that ensue, make them crucial in addressing key sustainability challenges of our time. This chapter elaborates on the living lab approach, HomeLabs, adopted by CONSENSUS, with respect to eating and washing in the home. A summary of the HomeLabs design is provided in section 3.1.1. The chapter then discusses high-level findings and provides some concluding thoughts on the experimental approach for policymaking.

3.1.1 HomeLabs design

The Eating and Washing HomeLabs were built on the findings from phase I of CONSENSUS (2009–2013), which adopted a visioning research process called practice-oriented participatory (POP) backcasting (see Doyle and Davies, 2013). This approach enabled diverse stakeholders from across the food and water sectors to come together in separate workshops to

Table 3.1. Living lab characteristics

Living lab characteristics	Explanation
Radical innovation	Focus on radical improvements to products, services and policies to enhance efficiencies, user experiences and sustainability.
Iteration	Develop, prototype, apply and evaluate concepts in experimental settings to manage innovation risk before up-scaling. Failure is accepted as inherent in the learning process of change labs.
Collaboration	Typically involves multi-disciplinary teams to address complex societal challenges and cross-sectoral actors to enhance spin-off opportunities for supporting identified innovations.
User engagement	Engage users from design phases to full experimentation to develop more creative, impactful and empathetic interventions that suit user needs, contexts and experiences (Scott *et al.*, 2009). This real-life, real-time evaluation enhances chances of innovation success in the real world.
Transformative knowledge	Test ideas that can be up-scaled to yield large-scale technical, social and/or economic transformation.
Learning and re-framing	Facilitate critical thinking, reflection and change in everyday assumptions, behaviours and actions.

imagine and co-create alternative sustainable food and water futures. The scenarios that resulted from this depicted a combination of lifestyle, technological and governance innovations that might collaboratively support more sustainable eating and washing practices. Following evaluation with citizen-consumers, the most promising concepts from the scenarios were refined and two Transition Frameworks were developed, which set out long-term interventions for their achievements [see Pape and Davies (2012) for the future of sustainable eating and Doyle and Davies (2013) regarding sustainable personal washing]. The HomeLabs experiment focused on implementing and evaluating the most promising concepts for sustainable eating and washing identified in phase I.

Working collaboratively with stakeholders outlined in Tables 3.2 and 3.3, CONSENSUS identified appropriate tools, governance and educational interventions collectively designed to script and influence more sustainable eating and washing practices. Interventions were introduced to households in the 5-week study period on a step-wise basis and a mixed method, ethnographic approach was developed to facilitate impact analysis (Button, 2000; Cash *et al.*, 2009). Each household was visited once a week to explore their HomeLab experiences, collect additional data and brief participants on weekly interventions. Semi-structured interviews were utilised as a primary form of data collection during these visits, with photographic evidence also taken to capture household progress.

The HomeLabs adopted a purposive sampling approach (Creswell, 2007) based on recruiting the most common household structures in Ireland for participation in each 5-week study (collected from CSO, 2012a). Recruitment strategies included group emails, online advertisements, snowballing and passing out flyers

Table 3.2. Stakeholders engaged in the design and delivery of the Washing HomeLabs

Sector	Area of expertise	Stakeholders (and location)
Private	On-shower water meters	One start-up company (California, USA) One commercialised water meter company (Germany)
	Showering technology	Two multi-national bathroom design companies One national shower manufacturer (UK)
	Smart water management	Two multi-national software companies One start-up company (California, USA)
	Water retrofitting	One retrofit company (Ireland)
	FMCG (i.e. for washing products)	Two multi-national FMCGs companies
Public	Provider	One national utility regulator (Ireland)
	Regulator	One national utility regulator (Ireland)
NGO and Research	Education/Awareness	One national heritage body (Ireland)
	Research (on water meters)	One technology research group at an institute of technology (Ireland)

FMCG, fast-moving consumer good.

Table 3.3. Stakeholders engaged in the design and delivery of the Eating HomeLabs

Sector	Area of expertise	Stakeholders (and location)
Private	Food acquisition	One international "grow it yourself" (GIY) start-up (California, USA) One national organic box distributer (Ireland)
	Storage and preparation	One online meal planning start-up (UK) One international kitchen device manufacturer (UK)
	Food waste recovery	One national waste segregation start-up (Ireland) One international composter manufacturer (Canada)
NGO and Public	Government advisor	One registered charity/company limited by guarantee (UK)
	Community organisation	One national enterprise (Ireland)
	Education/awareness	One heritage body (Ireland) One national food network (Ireland) One government programme funded by the environmental regulator (Ireland)

at garden festivals held in Dublin over the summer of 2014. Over 40 households in the Greater Dublin Area and commuter suburbs were selected as possible participants. This number was whittled down to ten final households; five for eating and five for washing.

Given the reported impact of household income, size and urban location on resultant environmental impacts (Tukker *et al.*, 2010), the ultimate HomeLab selection aimed to achieve a spectrum of household types, geographies and occupant demographics, while also balancing practical constraints relating to householder availability and geographical accessibility by the research team. From a food consumption perspective, Omann *et al*. (2007) also highlight more unsustainable practices amongst young, high income and single occupancy households. Efforts were thus made to recruit participants exhibiting such characteristics in the Eating HomeLabs. Meanwhile, more technical constraints had to be considered in the Washing HomeLabs, particularly regarding participant showering infrastructure. Tables 3.4 and 3.5 outline the key characteristics of the final households selected for each study.

Working with the stakeholders outlined above, CONSENSUS identified appropriate tools, rules, skills and understandings collectively designed to script and influence more sustainable washing and eating practices. Interventions were introduced to households over the 5-week study period on a step-wise basis (see Tables 3.6 and 3.7).

In terms of the HomeLab evaluation, the research applied a mixed method, ethnographic approach (Button, 2000; Cash *et al*., 2009). Social media was used to support interaction with the research team and it permitted householders to share their photos and experiences of their HomeLab progress. Each household was visited once a week to further explore their experiences, collect additional data and brief participants on weekly interventions. Sections 3.2 and 3.3 identify the high-level findings of the two HomeLabs.

3.2 High-level Findings: Eating HomeLabs

An important high-level finding is that through implementing a range of product, regulatory and educational

Table 3.4. Households recruited in the Eating HomeLabs

Profile	Couple household	Family with young children	Mixed professionals household (i.e. non-familial)	Single person household	Family with adult children
Identifier[a]	**Household C**	**Household FY**	**Household M**	**Household S**	**Household FA**
Occupants	2	4	3	1	4
Name[b] and age	Martina (27) Andrew (27)	Eamon (40) Jane (34) Eoin (4) Lisa (18 months)	Colette (32) Tríona (29) Sarah (28)	Mary (59)	Peter (63) Karen (61) Grace (31) Emma (28)
Income[c]	Middle	Middle	Low	Low	High
Home Type	Apartment	Semi-detached	Semi-detached	Semi-detached	Dormer Bungalow
Garden	No	Yes	Yes	Yes	Yes
Ownership	Rented	Owner-occupied	Rented	Owner-occupied	Owner-occupied
Location	Dublin suburbs[d]	Dublin suburbs	Commuter suburbs	Commuter suburbs	Rural

[a]The household keys outlined here (Household C, FY, M, S and FA) are used as identifiers in the results section along with the name of participants.

[b]These are pseudonyms to protect the identity of participants.

[c]Precise definitions of low, middle and high income are absent in Ireland (Collins, 2013), as probing income levels is often considered overly intrusive. Income attributes are thus based on participants' self-reported income ranking and any mention to budgetary constraints throughout the HomeLabs study.

[d]In Ireland, suburbs are defined by the Central Statistics Office as "the continuation of a distinct population cluster outside its legally defined boundary in which no occupied dwelling is more than 200 metres distant from the nearest occupied dwelling" (CSO, 2002, p. 163).

[e]The CSO (2002, p. 164) defines aggregate rural areas as places where people reside "outside clusters of 1500 or more inhabitants".

A, adult children; C, couple; F, family; M, mixed professionals; S, single, Y, young children.

Table 3.5. Households recruited in the Washing HomeLabs

Profile	Couple Household	Family with young children	Mixed household (i.e. non-familial)	Family with teenagers	Family with adult children
Identifier[a]	**Household C**	**Household FY**	**Household M**	**Household FT**	**Household FA**
Occupants	2	5	4	4	4
Name[b] and age	Darren (32) Amy (29)	Sam (42) Laura (40) Edel (13) Connor (9) Jack (7)	Ruth (36) Martin (36) Damian (35) Alison (33)	Gareth (50) Kathy (49) Ronan (18) Jill (16)	James (63) Aisling (61) Peter (25) Claire (21)
Home type	Apartment	Bungalow	Terraced Flat	Semi-detached	Semi-detached
Ownership	Owner-occupied	Owner-occupied	Rented	Owner-occupied	Owner-occupied
Location[c]	City Centre	Rural	Suburban	Suburban	Suburban
Shower flow	13.8 LPM	13 LPM	7 LPM	8 LPM	7.5 LPM

[a]The household keys outlined here (Household C, FY, M, S and FA) are used as identifiers in the results section along with the name of participants.

[b]These are pseudonyms to protect the identity of participants.

[c]As defined by the CSO (see CSO, 2002, p. 164).

A, adult children; C, couple; F, family; LPM, litres per minute; M, mixed; T, teenagers; Y, young children.

Table 3.6. Washing HomeLabs research process

HomeLab Framework / Practice Dimension	Week 1: Baseline	Week 2: Connected	Week 3: Efficient	Week 4: Adaptive	Week 5: Wrap-up
	Establish current habits and practices	Enhance understanding of water services and water availability	Identification of litre targets and prompting lower flow and social feedback	Trial less familiar practices that enable more substantial water reduction	Users adopt preferred practices based on experience and impacts measured
Governance:					
Rules and regulations Targets for average water consumption in litres per person per day	No targets	40 litres	25 litres	15 litres	No targets
Tools:					
Devices to enable participants to measure and manage consumption	Shower litre meter Shower timer	Shower litre meter Shower timer	Shower litre meter Shower timer	Shower litre meter Shower timer	Shower litre meter Shower timer
Hair and personal care products that may facilitate reduced water use	Users' existing products	Low foam shampoo Leave-in conditioner Hair and body wash	Low flow showerhead 2-in-1 shampoo and conditioner Co-wash	Low flow showerhead Dry bath product Dry shampoo product	Low flow showerhead Users' selected products
Skills and understandings:					
Behavioural guidance and motivational information		Communications on water cycle	Shower pausing and flow adjustments Costs and comparisons	Reduced washing and splash-washing Norms-challenging literature	
Research Process:					
Methods used to gather data	Shower logs WhatsApp Home visit	Shower logs WhatsApp Home visit	Shower logs WhatsApp Home visit	Shower logs WhatsApp Home visit	Shower logs WhatsApp Home visit

Table 3.7. Eating HomeLabs research process

HomeLab Framework / Practice Dimension	Week 1: Concretisation	Week 2: Acquisition	Week 3: Storage and Preparation	Week 4: Food Waste Recovery	Week 5: Wrap-up
	Baseline data collection and establish understanding of current eating habits	**Connect to food production, raise awareness of environmental impact**	**Optimum storage information, portion control, new meal ideas and meal planning**	**Impacts of food waste, waste hierarchy, and composting**	**Participants continue with preferred practices and evaluation**
Governance:					
Rules and regulations Targets and guidelines	No interventions	Carbon targets	Food safety guidelines	Brown Bin regulations	No interventions
Tools:					
Devices, technology and new food options that may facilitate more sustainable food shopping, cooking and disposal	No interventions	Organic fruit and veg box Home aquaponics kit Meal planning website Compostable food waste boxes Protein 1: organic meat	Organic fruit and veg box Fresh pod storage devices Fridge triage box Portion control tools Magnetic shopping list Protein 2: sustainably sourced fish	Organic fruit and veg box Electronic composter Bin odour and fly-reducing spray Protein 3: vegetarian options	No interventions
Skills and understandings:					
Behavioural guidance and motivational events	Future kitchen visions	Food seasonality information Shopping infographic	A–Z storage guide Personal chef visit	Food waste hierarchy Economics of food waste information Home composting guides	No interventions
Research process:					
Methods used to gather and analyse data	Habit Survey Food waste audit Home visit	Facebook page Food diary Home visit Feedback grid	Facebook page Food diary Home visit Feedback grid	Facebook page Food diary Home visit Feedback grid	Facebook page Food diary Food waste audit Home visit Intervention ranking

interventions for sustainable consumption, all household types were supported to make positive changes to their consumption practices. This is illustrated in particular by the fact that participant households reduced their overall food waste generation by 28% during the HomeLabs 5-week experiment. The remaining food waste was predominantly unavoidable in nature and 100% of the food waste was composted during the experiment, enabling householders to achieve effective zero waste to landfill by week 5 of the experiment. The Eating HomeLab also revealed the benefits of combining motivating forces, information interventions and devices for optimal behavioural impacts in sustainable food consumption. Importantly, the methodology created for HomeLabs could be modified in order to make it applicable beyond the boundary of the household to other institutions.

3.2.1 Product interventions

Product interventions used within the HomeLabs exhibited differentiated niche appeal, highlighting the need to target, tailor and adapt devices to suit alternate household profiles and contexts. However, it was clear that for all participants simplicity was key to achieving enhanced sustainability in eating practices. This even

applied when particular interventions were not perceived as being relevant to particular households, for example, the electric composter for households that already used a traditional compost heap. The interactions with alternative products stimulated reflection on current practices and discussion about the ways in which the intervention disrupted habits and built new skills and understandings. Ultimately, it was clear that product interventions for sustainable eating have an increased chance of success if they address all three pillars of sustainability and present environmental, economic and social benefits. Devices for sustainable eating will have minimal impact if not supported by appropriate regulatory and educational interventions.

3.2.2 Educational interventions

Reinforcing established critiques of knowledge-deficit models of individual behaviour change, the HomeLabs experiment indicated that an environmentally-focused message will not be enough on its own to change consumer behaviour with regard to sustainable eating. However, there is a role for educational interventions to clarify the meaning of sustainable eating, promote the seasonality of food and communicate about effective food storage in collaboration with supporting devices and regulatory frameworks. Participants in the HomeLabs felt that communicating such educational messages in brightly-coloured, visual or graphical formats will further ensure optimum impact. In addition, face-to-face and peer information transfers were seen to be more effective than online interaction for HomeLab participants; opportunities for more traditional media forms to mainstream the sustainable eating message were also highlighted. Ultimately, the power of experiential learning that moves beyond traditional knowledge-deficit models of communication must not be underestimated in the quest for sustainable food futures.

3.2.3 Governance interventions

While food regulation is currently dominated by health and safety concerns, and particularly by messages about food risk, there is relatively little in the public sphere regarding the sustainability of foodstuffs or food systems. There is a plethora of labels relating to provenance (e.g. local food), environmental impact (e.g. embodied carbon or food miles) and production systems (e.g. organic, fair trade etc.), but this leaves the consumer with a bewildering array of information that is rarely comparable or easily comprehended at a household food budget level. More clearly defined targets and punitive measures are necessary to increase the impact of regulatory frameworks for sustainable eating. It was felt by participants that a combination of "sticks" and "carrots" are necessary to achieve a more sustainable food future, with significant potential for sustainable choice editing at the retail scale; however, this requires political will to step into the food aisle. This has been done with respect to alcohol and an increased use of sugar or fat in certain countries, but is less well-developed with respect to sustainability because of its complexity and lack of agreed metrics. Essentially, improved food labelling is necessary for consumers to make informed sustainable food choices, but it needs to be co-ordinated with policy interventions that further other eating agendas, such as nutrition, health, allergies and weight loss.

3.3 High-level Findings: Washing HomeLabs

As with the Eating HomeLabs, integrated interventions relating to governance (e.g. water targets), tools (e.g. low-flow shower heads) and education (e.g. information provided through the water portal) yielded positive changes in washing practices across all participants. An average reduction of 47% in water use per person per day for personal washing was achieved during HomeLabs, although this masks a wide variation in practices amongst individuals within households. Nonetheless, there is clear potential for immediate actions and future collaborations to promote sustainable washing across all household types in Ireland.

3.3.1 Understanding of current washing practices

Heterogeneity predominates in washing practices both within and between households of different types. Six key types of washing practice were identified; people tended to adopt between one and three of the key types of washing practice at different moments. These are detailed in Table 3.8. Opportunities exist to target practice changes according to these different washing practice types. This potential has been developed and tested through the WASHLab exhibit, which formed part of the HOME\SICK exhibition at the Science Gallery (Davies *et al.*, 2015a,d). While there was an appetite among participants to reduce water use, it was also felt

Table 3.8. Washing types

Washing Type		Description
	The Routine Refresh Shower	Showers where the aim is primarily to refresh the physical appearance and to feel invigorated; often involving a hair wash
	Post-exercise Clean	Showering prompted by exercise and associated feelings of uncleanliness where freshening up is key
	The Wake-up Shower	Highly routinised and engrained morning showers where waking up and psychological functions of "starting the day" are primary motivations, in addition to feelings of cleanliness after a night's sleep and physical presentation for work
	Intensive Grooming	Showers that go beyond basic maintenance and include hair treatments, shaving, body scrubs and facials; often in preparation for going out
	Therapeutic Bathing and Showering	Showers or baths performed for therapeutic reasons where hot water, muscle relief, relaxation and recovery play key roles
	The Escapist Shower	Showering in excess of completing cleanliness functions where the shower is seen as a refuge for zoning out and escaping the pressures of daily life

that there was a 15-litre limit with regard to the minimum quantity of water needed to complete more intensive grooming activities, particularly hair washing tasks.

3.3.2 Governance interventions

The Water Portal was considered an important motivator for households as it contained information on water sources, availability, quality and pricing. Targets for water use motivated change amongst participants, but clear justifications for any targets are essential if citizen-consumers are to develop relations of trust with regulators.

3.3.3 Product and design interventions

Opportunities exist to reduce water use through innovation in hair and body care products providing that they perform well and meet the needs of users. There is low understanding of litre consumption related to washing and opportunities therefore exist to improve knowledge and to innovate new products that could improve this connection; this would make the water households use more visible. There was an inconsistent correlation between time spent in the shower and water consumption in showering due to different washing practices (for example, some participants paused water flow while lathering while others did not).

Behavioural interventions

Participants were surprised at how easy some practice changes were to implement; a finding which highlighted the power of "just trying it" to disrupt practices and promote learning. Planning washing activities is a key strategy to avoid over-usage of water, while pausing or reducing water flow can be a successful strategy for lowering water consumption. Ultimately, clarity on product directions and processes linked to hair and body washing activities is needed to optimise their contribution to water reduction. Effectiveness and efficiency are key levers to draw on when attempting to intervene in washing practices.

3.4 Longitudinal Impact Analysis

The high-level findings indicate merit in aligning and combining interventions, which support and facilitate more sustainable household washing and eating practices. During the intensive research period where researchers acted as intermediaries, sourcing and installing products and devices and providing access to information and training, households were able to disrupt their habitual behaviour and build new skills and gain a better understanding around their consumption practices. However, the HomeLabs also sought to establish whether participating in a HomeLabs experiment had any long-term impacts on washing and eating practices.

A survey completed by each participant assessing personal washing practices prior to the HomeLabs study in 2014 was conducted again after 6 months and then after 12 months, to explore the extent to which any changes induced by the study were maintained. The survey explored the washing activities performed and, drawing on Verplanken and Orbell's (2003) Self-Reported Habit Index (SRHI), examined the frequency and automaticity of their washing practices. Some studies (see Conner and Armitage, 1998) argue that including additional factors such as habits into current behavioural change models like the Theory of Planned Behaviour (Ajzen, 1991) can better predict environmental behaviours. For the HomeLabs, the SRHI (Verplanken and Orbell, 2003) was utilised as a response–frequency measure to assess habit strength for certain washing practices across the five households. Respondents completed the SRHI at the start of the Washing HomeLabs and then again at the 6-month follow-on study and finally at the 12-month follow-on study. Essentially, respondents were asked to indicate their level of agreement, using a five point Likert-scale response, with statements related to washing habits. Each individual then received a total score for each washing habit that ranged from 6 to 30; with higher scores indicating deeper habit strength for each particular washing practice. For the purposes of Homelabs, a habit was considered to be strong with scores of >20, neutral for scores between 15 and 19, and weak for scores between 6 and 14. The following sections summarise the key findings of these follow-up surveys and full results as detailed in Davies *et al*. (2015a).

3.4.1 Washing follow-on survey results

Nearly a quarter of all participants in the Washing HomeLabs reported an increase in the sustainability of their washing practices 1 year on from participating in the HomeLabs, with showering and bathing frequency declining on average across all households following the HomeLabs experiment. Taking a shorter shower is the most commonly adopted practice change across all households, while the use of the shower timer and/or the litre meter was adopted by participants in four out of five households. The participants felt that the litre meters provided a useful reminder of water use, but also felt there were currently few incentives to motivate people to purchase and install them.

In terms of the strength of habitual washing practices, the action of taking a shorter shower remained a strong habit for households throughout the study period. Indeed, after 12 months the strength of the habit had increased across each household bar one. In the initial survey prior to the HomeLabs experiment, adjusting the flow of water while showering was predominantly a neutral habit for all households, but it became a strong habit after 12 months for two households. Likewise, reducing water use while in the shower was a neutral habit for all households prior to the HomeLabs, but had become a strong habit for three households after 12 months. In contrast, reducing water use in the sink was a strong habit for all households initially, but while three households identified this as a stronger habit after 12 months, the habit strength had actually decreased in two households. Turning off the tap while brushing teeth was a strong habit for all bar one household at the baseline stage, but it had become a strong habit across all households after 12 months.

In order to promote more sustainable washing practices, respondents were asked to indicate which supports (i.e. products, devices, regulations and information) might encourage them to change their washing practices further in the future. The responses reported were diverse indicating that there is no "one-size-fits-all" solution to promote more sustainable washing; however, the respondents did emphasise that further interventions like HomeLabs would be useful to maintain practice changes, which highlights the importance of reminders and ongoing behavioural cues. Three respondents mentioned water charges as a key driver in raising awareness of water use, by creating visibility through material costs. Two respondents also indicated that water meters and timers provided added value supporting water reduction, while another two indicated the need for broader education about water within schools as an important opportunity for connecting children with the resources they use.

3.4.2 Eating follow-on survey results

Twelve months after having participated in the Eating HomeLabs, 80% of participants reported eating more sustainably, with more people reducing their meat intake at least once or twice a week and the numbers of people growing their own food and sharing food doubling over the study period. People felt more comfortable assessing the quality of their food rather than relying on labels such as "best before", with increased attention to food labels across the board, with the exception of "low fat" information. While households were pleased with the quality of the produce from the homebox delivery schemes they were supplied with for free through the HomeLabs experiment, none of the households participated in these schemes once the HomeLabs experiment ended. This was primarily due to what they saw as high costs of the service.

With respect to kitchen, storage and waste management, more people reviewed the contents of their fridges on a weekly basis at the end of the study. Usage rates of other kitchen management devices, such as the freezer, smart phone apps, storage devices, kitchen waste caddies, brown bin and composters, also increased from baseline to 12 months post-HomeLabs participation. In particular, the use of storage devices, such as simple triage boxes where food that is to be eaten next can be placed, increased dramatically from 8% prior to HomeLabs to 75% by 12 months. Use of a brown (organic waste) bin saw an increase of 30% from baseline to 12 months after the study, while the use of a composter increased from 33% to 50%. However, the electric composters tested by all households were felt to be unnecessary and energy intensive where a brown bin or existing composting facilities were available. In this case, the hi-tech solution was not seen as appropriate for a variety of reasons including costs (to low income households), space (for those living in apartments) and induced additional resource use.

In terms of the strength of certain habits across the study, results of the follow-on surveys indicated that meal planning had become embedded into household routines, with all households reporting meal planning as a strong habit by the end of the study. Likewise, following a shopping list to ensure that purchases take household needs into account increased from being a neutral habit to a strong habit in four out of five households. Purchasing organic food shifted from being a weak or neutral habit for all households prior to the HomeLabs study to being a strong habit for all except one household 12 months after the Homelabs study. Purchasing local produce was a weak habit for three out of five households, with only one household reporting it as a strong habit prior to HomeLabs participation. After 12 months, the strength of this habit increased in all except one household, where it remained weak. The picture for composting is mixed. Two households maintained this as a strong habit across the 12-month period, one household shifted from it being a weak to strong habit; the other two households, however, still reported composting as being a weak habit 12 months after the study. In terms of avoiding food waste, four out of five households reported this as a strong habit prior to the HomeLabs experiment and this remained the same 12 months after the experiment.

3.5 Conclusions

Overall, HomeLabs provided an opportune space to trial policy, product and behavioural interventions for more sustainable eating and washing practices. As with broader living lab methodologies, the feedback and reactions obtained from householders provide a foundation for the iteration and improvement of the supplied tools, rules and educational interventions, and has as the ultimate aim the mainstreaming of sustainable food and water consumption. Feeding back specific recommendations to the collaborating organisations involved

in providing supports for HomeLabs, formed the first step in this impact process; ideas for future product development that connect with sustainable eating and washing agendas and appropriate future collaborations were highlighted.

It is clear from the results provided in this chapter that the HomeLab methodology delivered additional benefits in shifting participants' everyday practices, albeit in different ways depending on the washing and eating practices of those involved. The need to consider different capabilities, reactions, preferences and priorities when it comes to achieving future behaviour change is, nonetheless, evidently crucial. Given that 20–30% of a household's environmental impact arises from food and drink consumption in Europe (Tukker *et al.*, 2006) and that personal washing accounts for circa 38% of per capita consumption (EPA, 2006), attention must be paid to everyday household practices when attempting to think about an alternative sustainable future. HomeLabs addressed this need, albeit in specific geographic and limited temporal contexts. It represented a space to debate and test sustainability transitions with those who are frequently called upon to "take action" to protect the environment and use resources more efficiently. Essentially, they progressed ideas about future sustainable consumption from abstract scenarios to concrete realities. The research has highlighted the potential benefits of co-ordinating technological, policy and informational supports with appropriate motivating forces through governing arrangements (such as that provided by the researcher engagement and targets) for optimising behaviour change.

As is detailed in Davies and Doyle (2015), a challenge for experiments such as HomeLabs is how positive outcomes identified in bounded experimental sites might be rolled out. The intensity of human resources involved in establishing, running and evaluating HomeLabs-style initiatives means that simply scaling up such activities nationwide is unrealistic. Complex and dynamic issues of power, knowledge and politics can easily affect attempts to replicate activities across space and time. In conclusion, rather than seeing HomeLabs as outcomes to be rolled out nationwide, it is more useful to see them as testbeds for grounding and interrogating collaboratively designed scenarios for more sustainable household consumption futures. Further research and analysis is required before it is possible to say whether or not particular configurations of interventions (including the crucial roles of actors such as filters, facilitators and interlocutors) have wider potential to disrupt unsustainable household consumption practices in different settings. Nonetheless, the risks of untrammelled household consumption are so great, and gains made from governing approaches to date are so limited, that continued collaborative experimentation with different ways of approaching consumption governance is essential.

4 Mobility Biographies and Milestones

4.1 Key Issues

Transport and mobility research carried out in Phase I of CONSENSUS challenged technocentric and economistic views of mobility that have dominated research, policy and practice to date. It explored the persistence of car-centric commuting patterns and demonstrated how understanding human needs and desires concerning transport and mobility is central to curbing the "unsustainable consumption of distance" (Heisserer, 2013; Heisserer and Rau, 2015). Moreover, the dynamics of mobility practices across the life course and the role of life events in re-shaping how people travel in everyday life emerged as a central issue, warranting further research. For example, Heisserer's (2013) typology of commuting practices made the impact that others (e.g. children, elderly relatives) have on individuals' modal choice and route selection visible; this highlights the interconnectedness of individuals' consumption biographies within households. Moreover, travel behaviour is strongly contingent upon its wider (infra)structural context, including prevailing "systems of provision" (Evans, 2011) that either promote or preclude certain mobility options (e.g. car-sharing, use of bicycle rental schemes and public transport). Linking individual mobility biographies to the histories of mobility policies and developments can thus reveal the causes and effects of (un)sustainable mobility practices.

The concept of mobility biographies constitutes a new field in social-scientific transport research, reflecting growing awareness of these biographical and historical dynamics (Lanzendorf, 2003; Schoenduwe *et al.*, 2015). Mobility biographies research (MBR) maps show how key life events, such as moving home, starting college and changing job, coincide with more or less radical changes in mobility practices (e.g. switch from cycling to car-based commuting) (Tully and Baier, 2011; Scheiner, 2014; Schoenduwe *et al*., 2015). Recognising the strong potential of MBR for investigating current patterns of (im)mobility in Ireland and how to either encourage or transform them, CONSENSUS II adopted this novel approach.

4.2 Results

CONSENSUS II WP3 sought to close some conceptual and empirical gaps in the social-scientific investigation of mobility practices, focusing in particular on potential "windows of opportunity" across the life course for changing mobility practices. Firstly, we introduced the novel concept of "mobility milestones", i.e. events that are primarily mobility-related and highly contingent upon structural conditions that directly or indirectly affect individuals' mobility options (Rau and Manton, 2016; Manton and Rau, forthcoming). Mobility milestones, such as getting a driving licence or buying a car or bicycle, reflect the wider mobility system, including social norms, transport-infrastructural conditions, state-led regulation of mobility through laws and policy, and wider social and economic circumstances. Secondly, we reviewed the MBR literature thoroughly in order to identify the most influential life events and mobility milestones, and techniques for data collection and analysis used to date. The life-course calendar and event lists emerged as useful tools for gathering and analysing quantitative mobility biographies data. Thirdly, an online survey was developed as the main data collection tool; this was chosen for reasons of cost-effectiveness, speed of distribution and its easy, user-friendly completion. Following an expert consultation and a pilot phase that highlighted the importance of facilitating respondents of all ages, computer literacy levels and abilities to answer the survey, a specialist survey design company was hired to programme custom question formats, which greatly improved the accessibility and aesthetic of the survey instrument. Part one of the survey gathered information about past and present work/school/college and leisure travel patterns using multiple-choice questions. This was followed by a life-course calendar to record respondents' mode of travel and residential location for each 5 years of the respondent's life up to the current age. The third section (Figure 4.1) recorded the occurrence of life events and mobility milestones in respondents' lives and their perceived effects on mode of travel.

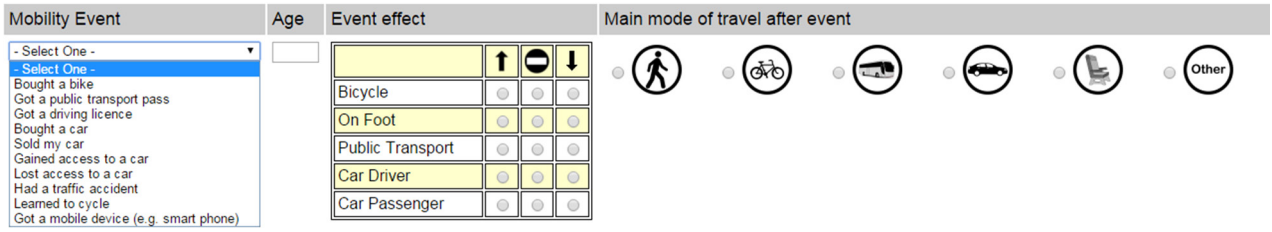

Figure 4.1. Survey question recording mobility milestone occurrences and effects.

The concluding section covered attitudinal and demographic questions, such as "ideal" mode of travel, gender, residential location and professional background. The online survey was rolled out across the island of Ireland in March–April 2015, yielding 324 complete responses. Due to the nature of online surveys concerning sampling, it is not possible to calculate an exact response rate. Due to a very low response rate from Northern Ireland, the results below focus solely on Ireland. While not representative in the statistical sense, the sample was judged to reflect the demographic composition of the Irish population reasonably well.

4.2.1 Summary of key findings

There were 740 life events entered, which is an average of 2.3 life events per respondent (this suggests under-reporting). The events most commonly identified as having influenced travel patterns were starting college, moving home, starting a first job and changing job. The bunching of these events around the age period between 20 and 30 years old shows the highly dynamic nature of the 20s; this is discussed further below. Regarding the reported impact of these events on modal use, respondents stated that upon starting college they increased their use of more sustainable modes of travel: 71% and 69% indicated an increase in walking and public transport, respectively, while 23% reduced their driving. Regarding increases in driving, having a child (76%) and starting a first job (54%) emerged as leading life events. As these figures simply correspond to increases in modal usage (e.g. driving further or spending more time in the car), it was desirable to learn more about modal shifts (e.g. from driving to cycling). Although it was not possible to causally link life events and modal shifts, combining life-course calendar data (mode of travel at each 5 years of age) with information about the respondents' ages at which certain life events occurred allowed an association between the two. Using this method, an average of 2.3 changes in main mode of travel per respondent was identified. Focusing explicitly on modal shifts related to driving, approximately one third of instances of starting a first job and changing job coincided with a shift towards driving; increases in disposable income, and time pressure and residential relocation to a less accessible area were identified as possible reasons. Although 15% of those starting college shifted their main mode away from driving, a further 13% took up driving after this life event.

The most frequently entered mobility milestones were getting a driving licence, buying a car and buying a bicycle. Unsurprisingly, almost all respondents reported an increase in driving following the first two of these (at the expense of sustainable modes of travel), and an increase in cycling following the third. However, the increase in cycling after buying a bicycle was linked to a greater decrease in walking than driving (see below). Turning to modal shifts, getting a licence, getting access to a car and buying a car all incurred substantial shifts towards driving (35%, 31% and 46%, respectively). Meanwhile, 14% of bicycle purchases and 12% of regular public transport (PT) ticket purchases coincided with modal shifts away from driving. The stated and revealed effects of life events and mobility milestones on driving are summarised in Table 4.1. "Stated change" corresponds to the percentage of respondents reporting an increase (+), a reduction (–) or no change (+/–) in driving. "Revealed shifts" refer to the percentage of instances of a life event or mobility milestone that are associated with a modal shift to driving (+), away from driving (–), or no change in main mode (+/–).

To further analyse a selection of these life events and mobility milestones, and to examine the effects of historical changes to the transport system, three (birth year) cohorts were formed: "Today's 40s" (born 1965–1974), "Today's 30s" (born 1975–1984) and "Today's 20s" (born 1985–1994). The sample size and demographic characteristics of the three cohorts were broadly similar (with the exception of the over-representation of women in the Today's 30s group). It was possible to validate

Table 4.1. Stated and revealed effects of life events and mobility milestones on driving

Life events	Stated change (%)			Revealed shifts (%)			Mobility milestones	Stated change (%)			Revealed shifts (%)		
	+	+/–	–	+	+/–	–		+	+/–	–	+	+/–	–
Moved home	35	41	24	21	67	12	Got a licence	94	4	2	35	58	7
Started college	14	63	23	13	72	15	Bought a car	99	0	1	46	51	3
Started first job	54	33	13	34	60	6	Got car access	88	12	0	31	69	0
Changed job	48	27	25	35	56	9	Bought a bicycle	2	66	32	3	83	14
Had a child	76	18	6	25	65	10	Got a PT pass	4	55	41	4	84	12

some of the travel patterns of the cohorts by comparing Central Statistics Office data for travel to primary and secondary school in the 1986, 1996 and 2006 censuses. This showed a good level of accuracy for the modal share results. Comparing the school travel of the three cohorts demonstrated the higher levels of walking and cycling by Today's 40s, while car use substantially increased for the younger cohorts (both statistically significant at the 1% level). The most interesting data were derived from the life course calendar, i.e. the modal share breakdown for each cohort at each 5 years of age. Unsurprisingly, Today's 20s exhibited the highest level of car use at each data point up to being 20 years old (beyond which it was not possible to compare). For example, at age 5 the percentage modal share of the car was 31% for Today's 40s, 51% for Today's 30s and 62% for Today's 20s; at age 20, the car modal shares were 14%, 16% and 26%, respectively.

An analysis of developments in Irish transport between 1965 and 2014 contextualised the travel patterns of the three cohorts (and their experience of mobility milestones) and revealed potential structural influences on individual- or cohort-level mobility. Broadly, the trend across the last 50 years is one of almost constantly growing car-dependency. The car established its dominant position in Ireland following the Second World War and, despite deteriorating road infrastructure in the 1970s and 1980s, car ownership, traffic volumes and road-based freight continued to rise. The Celtic Tiger boom saw a rise in pro-car policies and increased funding for road and motorway construction as well as a formalisation of the driving licensing system. Reductions in vehicle kilometres travelled during the recent recession (2008–2015) appear temporary, although some improvements to urban public transport and cycling infrastructure have been made. Today, more than three-quarters of people in Ireland travel to work in a car and there are two million cars on the road, travelling a total of 32 billion kilometres per year (CSO, 2012b, 2015). Based on these insights, subsequent work focused explicitly on car use.

Drawing on work by Shove and colleagues (Warde, 2005; Shove, 2010; Shove *et al.*, 2012), a practice–theoretical framework, defining practices as a combination of material aspects, competence and meaning, was used to link cohort- and society-level evidence. Based on a historical review of the Irish transport system and the mobility milestones for all three cohorts (experienced before the age of 30), WP3 identified a set of empirical manifestations for the two levels (society and cohort) and across the three elements of practices (material, competence and meaning). These included State spending on roads and buying cars (material), the driving licensing system and getting a licence (competence) as well as documentary evidence regarding car use and the cohorts' "ideal" mode of travel (meaning) (Manton and Rau, forthcoming).

Starting with the material element of car use, it is clear to observe the increasing investment and policy priority given to road-based transport as the years have passed. At the same time, there is an observable increase in the car modal share for each cohort and a statistically significant decrease in the average age of buying a car. In the past 5 years, however, roads have attracted less funding and policy prioritisation, and this may explain the lower level of car purchasing by the youngest cohort. The competence element of car use generally concerns the acquisition of a driving licence. There is a very clear increase in the formalisation and expansion of the driving licensing system in the last 20 years, which is reflected in the three cohorts passing their tests in greater numbers and at an earlier age as the years progressed. Finally, although it is difficult to record changes in the meaning of car use as a practice, documentary evidence suggests the increasing

importance of the car for accessibility and status in Irish society; the youngest cohort, Today's 20s, reported the highest level of the car as their ideal mode of travel. In all, this analysis suggests that car use has become increasingly entrenched through investment in transport infrastructure, policies and traffic laws.

4.3 Summary and Recommendations

Transport faces a wide range of challenges in improving sustainability, not least due to the largely habitual nature of human travel behaviour and slow-moving infrastructural provision. Transport and mobility conducted as part of phase I of CONSENSUS showed that while individual-level changes are undoubtedly effective if adopted by a large number of people, the challenge of far-reaching structural changes persists. Current efforts remain polarised between techno-centric or economistic measures [often based on (infra)structural changes] and individual-level promotional campaigns.

This WP sought to provide new insights into mobility practices that are relevant to both the MBR community and policy- and decision makers in the Irish transport sector. This was achieved by:

- adopting a mobility biography approach that considers changes in travel patterns across the life course;
- developing the novel "mobility milestones" concept;
- deploying the first mobility biography survey in Ireland, using an innovative online instrument;
- analysing the effects of life events and mobility milestones on mobility practices;
- deriving three cohorts from this survey's data and comparing their travel patterns;
- reviewing the development of the Irish transport system over the last 50 years; and
- using a practice–theoretical framework to analyse car use and link individual and structural level influences of the practice.

4.3.1 Key conclusions

The following are the five key conclusions of the study:

- The adoption of a life-course approach to exploring continuity and change in mobility patterns would represent a step forward for transport policy, which often indiscriminately targets individuals' travel behaviour regardless of their life course position. For example, this study found that behaviour in the period of being between 20 and 30 years old is particularly dynamic.
- Recognising the impact of life events on mobility (e.g. moving home, starting college and changing job) offers major opportunities to tailor policies and interventions to these "windows of opportunity". Ireland could learn from other European countries that, for example, deliver transport network information packs and free PT tickets to newly registered residents in cities with diverse public transport, walking and cycling options (e.g. "Neubürgerpaket" in Munich, Germany).[2]
- The mobility milestones concept represents a useful guide for analysing the social, political and infrastructural influences on mobility-related events in individuals' lives. Consider, for example, the acquisition of the driving licence as a rite of passage for young people and the formalisation of the licensing system over the last 20 years.
- There are very important lessons to be learned from the history of the Irish transport system, especially the entrenching of car-dependence, and how this manifests itself in everyday life. Past experiences of increasing "lock in" of car use serve to caution against a sole focus on individual behaviour change and unrealistic expectations of immediate and radical transformation towards sustainable transport options. Instead, advocating broader change to transport infrastructure, policies and traffic laws emerges as a promising alternative.
- Finally, the mobility biography research field, though embryonic, is growing rapidly. There is significant potential for further conceptual and methodological development. It would be particularly instructive to roll out comparable mobility biography studies internationally, with the aim of better understanding influences on mobility patterns and pointing towards opportunities for sustainable behaviour change.

2 https://www.muenchen.de/rathaus/Stadtverwaltung/Kreisverwaltungsreferat/Verkehr/Mobilitaetsberatung/Neubuerger.html

5 Conclusions and Recommendations

CONSENSUS II marks a unique milestone for consumption research in Ireland. It progresses, in a coherent and comprehensive fashion, foundational understanding of household consumption practices and associated mobilities, and develops novel tools and methodologies for comprehending the complexity of consumption. This chapter draws on the overarching findings of the project and indicates a suite of recommendations for keeping up the momentum in the drive towards more sustainable household consumption as initiated by CONSENSUS in its entirety.

5.1 Summary of Findings

5.1.1 Segmenting for sustainability on the island of Ireland

As documented in Chapter 2, WP1 "Segmenting for Sustainability on the Island of Ireland" involved undertaking detailed factor and segmentation analysis of the large dataset that resulted from the original CONSENSUS Lifestyle Survey. WP1 researchers also conducted a comparative study of two regions within distinct policy contexts, namely Northern Ireland and Ireland.

The findings from WP1, "Segmenting for Sustainability on the Island of Ireland", clearly illustrate the heterogeneity and richness of pro-environmental behaviour, thereby challenging much existing research that treats different types of "green" behaviour as part of the same phenomenon. In an attempt to unpack "pro-environmental behaviour" as a category, CONSESUS II researchers examined two distinct types of actions – habitual behaviours and occasional actions – and presented evidence for their distinct characteristics, capturing variations between the respondents who reported them. Through an in-depth analysis of the CONSENSUS survey data, WP1 researchers identified and described in detail the different groups of people who undertake either of these types of behaviour, or both. The research illustrated that survey respondents differed in their uptake of occasional and habitual pro-environmental behaviours. Considerable differences exist between the two behaviour groups with regard to key socio-demographic variables such as employment status, income, residential location and housing tenure. For example, respondents who are less well-off and less well educated are more likely to report everyday habitual activities such as buying reusable items, saving water and energy, and repairing faulty gadgets and appliances rather than discarding them. This suggests that some of this habitual behaviour may be due to financial necessity rather than deliberate choice. In contrast, better-off respondents with a higher educational status were more likely to report engagement in occasional "green" behaviour such as retrofitting the house or purchasing an energy-efficient household appliance, all of which require a much higher financial commitment at a single point in time.

This research has major implications for changing consumption behaviour. The act of thinking about target groups will itself make a difference to the way in which sustainability campaigns are designed and implemented. Instead of treating society as one homogenous group and trying to find the perfect "one size fits all" model for the whole population, this approach focuses on identifying subgroups that have experienced a comparable set of events. Therefore, this approach has significant potential to further advance our understanding of pro-environmental behaviours.

5.1.2 HomeLabs

Trialling, testing and evaluating ideas related to reducing the resource intensity of household consumption is a necessary step in any transition towards more sustainable consumption. The CONSENSUS HomeLabs provided a means through which to do this. The HomeLabs were both process and product in this regard, in that the researchers who facilitated the HomeLabs were themselves part of the suite of "interventions" that households were provided with over the duration of the experiment. In fact, the researchers, their physical presence during weekly home visits and their ongoing motivational suggestions provided through social media (e.g. apps, Facebook, text messages) were vital elements in the process and they certainly increased the impact that the tools, rules, skills and understandings

that were provided to participating households had. The HomeLabs process was not only about seeing whether or not combining and aligning supportive interventions assisted in greater reductions in consumption, it also provided valuable insights for the designers and retailers of the provided interventions. Feedback to those enablers, who varied from large multi-national corporations to micro-entrepreneurs, was very much an important part of the research process, improving communication across production–consumption–disposal dimensions and enhancing learning at all phases.

It is clear from the results documented in Chapter 3 that the HomeLab methodology delivered significant benefits in assisting participants to disrupt their habits and reduce the resource intensity of their everyday eating and washing activities. However, it is important to emphasise the highly differentiated nature of people's consumption practices within the home and the ways in which the interventions worked differently across the varied practices; it is particularly important for those who are in charge of developing and implementing policies to be aware of this. There is no "silver bullet" or "one size fits all" solution in either eating or washing habits that will consistently or persistently reduce consumption to the extent that is probably required in the future. Unfortunately for those in charge of delivering policies that will lead to more sustainable consumption, it will not be a simple task of "scaling up" HomeLabs nationwide. This was not the intention and it also certainly would not be a feasible approach given the intensity of resources required to deliver HomeLabs successfully. The research does indicate, however, that tailoring support in a way that resonates with people's needs and accommodates their physical and social context is more likely to optimise the extent to which change will occur and become habituated. Certainly, technological fixes will form an important part of any shift towards more sustainable consumption, but the social dimension of both eating and washing must not be underestimated. Water and food are the physical resources that are consumed during eating and washing; focusing solely on this dimension would provide only a partial response, however, and one which may create negative reactions in the long term as participants fail to see how their lives fit with some notional "average consumer". The need to consider different capabilities, reactions, preferences and priorities when it comes to achieving future behaviour change is essential.

5.1.3 Mobility biographies and milestones

Transport faces a wide range of challenges in improving sustainability, not least due to the largely habitual nature of human travel behaviour and slow-moving infrastructural provision. Transport and mobility research conducted as part of CONSENSUS showed that while individual-level changes can be effective if adopted by a large number of people, the challenge of far-reaching structural changes persists. Current efforts remain polarised between techno-centric or economistic measures [often based on (infra)structural changes] and individual-level promotional campaigns. Transport research in CONSENSUS II confronted this challenge by drawing on the emerging MBR field, which offers the potential to examine changes in mobility patterns from a life-course perspective. Of particular interest was the array of key life events that structure the life course and offer "windows of opportunity" for sustainable behaviour change. To this field, we have added "mobility milestones" to capture mobility-related events, explicitly recognising influences on mobility choices and practices that go beyond the individual level and reflect socio-political, economic and infrastructural conditions. The innovative mobility biography survey (the first in Ireland), delivered rich data on typical occurrences of a range of life events and mobility milestones, their effects on travel behaviour and the characteristics of those who experience them.

This process led to the following four key recommendations for transport policy:

- In order to enhance the effectiveness of future sustainable transport policy initiatives, the effects of life course position on mobility patterns need to be considered.
- Specific transport-related policies and interventions need to recognise the significance of key life events for mobility practices and respond accordingly.
- More attention needs to be paid by those who develop transport policy and actions to the broader social, political and cultural context of mobility-related events and changes.
- Prevailing pro-car conditions in relation to investment, infrastructure provision and traffic laws need to be challenged and corrected if sustainable transport initiatives and the promotion of active modes (e.g. walking, cycling) are to succeed.

5.2 Impact Highlights

CONSENSUS II has developed a rich body of knowledge for the research community, and public, private and civil society actors, far beyond that originally envisaged. This section summarises these outputs by outlining the impact highlights. Full details of all outputs can be found in Appendix 2.

5.2.1 Academic outputs

While the original plan was to generate six high impact peer reviewed articles, it is clear from the summary in Table 5.1 that the CONSENSUS team has far surpassed this number, with 14 articles in high-impact journals, including *Global Environmental Change*, *Journal of Consumer Culture* and *Environmental Innovation and Societal Transitions*, already published and more articles to be published over the next 12 months.

Similarly, it was envisaged that around seven presentations would be made at national and international conferences such as the annual meeting of the Royal Geographical Society (UK) and the annual meeting of the Association of American Geographers (USA). Over the 2-year period, the CONSENSUS team gave 41 presentations to national and international audiences in a variety of academic, private-sector and policy-facing events.

Together, CONSENSUS and CONSENSUS II developed intellectual capacity on sustainable consumption through the training and mentoring of seven PhD students and five post-doctoral researchers; these did not consist of only those employed directly on the research project but also of researchers on spin-off projects utilising concepts, methodologies and data from CONSENSUS as their foundation. For example, in 2014, Science Foundation Ireland funded an innovative collaborative project on energy retrofitting that aims to bring together social science and engineering expertise, and which builds on and extends insights from CONSENSUS. Furthermore, all lead CONSENSUS academics were active lecturers in their respective institutions and they developed courses in the areas of geography, sociology and political science based on the theme of sustainable consumption. Consequently, in addition to fourth-level supervision, the research has informed undergraduate and postgraduate teaching; approximately 2750 undergraduate students have enrolled in these courses since 2010.

In addition, there has also been considerable transnational learning between communities of consumption researchers and international public and private collaborators. For example, the international CONSENSUS II Conference, held in the National University of Ireland, Galway, in May 2015, saw presentations by leading figures and experts in the consumption field, as well as by the CONSENSUS team. The CONSENSUS Lifestyle Survey instrument has also been employed by a number of different international research teams (e.g. by researchers at the University of Oregon and the University of Idaho, and academics at the University of Otago and in the School of Engineering and School of Sociology and Political Science at the National University of Ireland, Galway). A number of industry partners, such as Helena McElmeel Architects and Clúid Housing Association, have also deployed parts of the Lifestyle Survey as part of ongoing projects. For example, elements of the questionnaire were employed in surveys conducted with resident's pre- and post-retrofit work on their homes as part of a sustainable energy project in 2012/2013 and 2015.

As a direct result of the CONSENSUS research, spin-off projects have emerged. Transnational networks of researchers, including CONSENSUS team members as driving forces within those networks, have been central in propelling the consumption research agenda within Europe and further afield. New projects that derive their foundation from the insights of CONSENSUS have also been funded. The Principal Investigator of CONSENSUS has been awarded a European Research Council Consolidator Award to examine food sharing

Table 5.1. CONSENSUS II outputs

WP	Papers	Reports	Presentations	Other
1	4	5	18	12
2	7	12	17	7
3	3	1	6	4
Total	14	18	41	23

economies in cities (SHARECITY), which builds directly on the findings of CONSENSUS backcasting.

The lead researcher on WP1 was successful in obtaining a grant from the National Economic and Social Council (NESC) to further some of the policy recommendations emerging from CONSENSUS. This NESC study aimed to identify and distil critical insights from programmes, initiatives and front line companies and agencies, on which approaches, mechanisms, drivers and linkages appear to make the integration of environmental policy into mainstream policy possible in practice. This small scale study conducted between September 2014 and March 2015 captured a wide set of experiences and contexts which prevail in the overall context of environmental policy integration (EPI) in Ireland. The first case study focused on two Bord Bia sustainable food and drink assurance schemes (SFDAS), namely Origin Green (OG) and the Sustainable Dairy Assurance Scheme (SDAS). The second case study examined green procurement (GP) (practices in the public and private sector.

The identification of significant gaps in the global sustainable consumption research landscape formed a significant part of CONSENSUS (cf. Rau *et al.*, 2014) and was subsequently used to shape European and international research agendas. In 2014, CONSENSUS researchers Rau and Fahy led the development and submission of a concept paper to the European Commission on behalf of the international network – Sustainable Consumption Research and Action Initiative (SCORAI) Europe. The position paper titled "Reaching the top of the resource-consumption-hierarchy: socio-technical innovations for sustainable consumption policy and practice" built on key insights from CONSENSUS WP1 generated in 2009–2010. This WP catalogued and critically examined existing examples of good practice in relation to both SC policy and practice and pointed towards an emerging hierarchy of solutions. The CONSENSUS researchers subsequently developed the resource–consumption–hierarchy (Figure 5.1) as a heuristic method for assessing the scale of the resource impact of different forms of consumption, ranging from "green" consumption at the bottom (Layer 1) to dramatically reduced consumption at the top (Layer 4). This, in turn, has implications for the desirability of policy interventions geared towards reducing consumption-related resource use (see SCP Policy Priorities Pyramid in Figure 5.2).

CONSENSUS findings highlighted that interactions between environmental, economic and social implications of these four types of consumption remain poorly understood and that considerable variations exist between EU Member States regarding the relative importance of each level. CONSENSUS WP1 also demonstrated that many SC activities in Europe tend to concentrate on the bottom two layers of the hierarchy (buying and repairing), where environmental impacts remain relatively high (Pape *et al.*, 2011). The top two layers of the hierarchy (sharing and "back to basics") require a significant transformation of consumption practices but promise greater environmental gains. Furthermore, outputs from CONSENSUS revealed that the practical applicability has been inadequately demonstrated, especially at the meso-level of social organisation (e.g. firms, public institutions) (Davies *et*

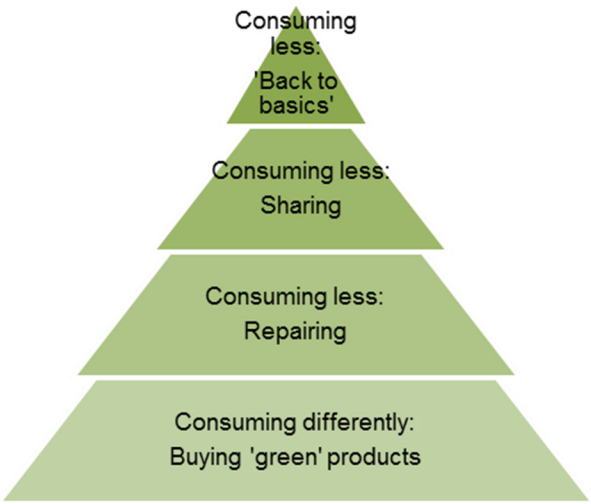

Figure 5.1. The Resource–Consumption–Hierarchy Pyramid.

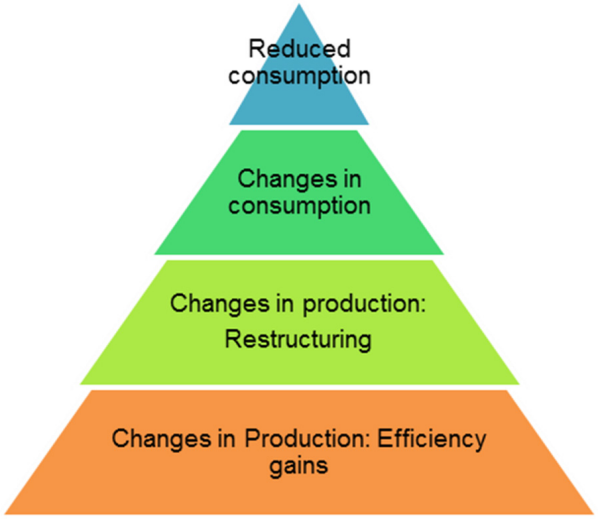

Figure 5.2. The SCP Policy Priorities Pyramid.

al., 2014b). These insights clearly point towards the need for further research at the European scale, with CONSENSUS team members being uniquely positioned to take on a leading role in future international sustainable consumption projects. In 2016, CONSENSUS team members Henrike Rau and Frances Fahy led a consortium of sustainability researchers from across Europe and were awarded large-scale Horizon 2020 funding under the SC3 call – LCE-31-2016-2017 – on energy efficiency. Building on the results and methodologies developed throughout CONSENSUS, this new research project ENERGISE (European Network for Research, Good Practice and Innovation for Sustainable Energy) aims to provide an understanding of the factors driving individual and collective energy choices and practices across Europe.

5.2.2 Policy and practice

A key dimension of CONSENSUS II was the development of insights for wider stakeholders beyond the research community and those directly involved in the CONSENSUS research. This included the development of a Briefing Note on ChangeLabs as a mechanism for exploring and evaluating innovations for more sustainable consumption (Devaney *et al.*, 2014), segmentation profiles for tailoring policy interventions and a Policy Briefing note on segmentation (Lavelle and Fahy, 2015c) and the identification of mobility milestones to promote sustainable consumption across the life course (Rau and Manton, 2015). In addition, tailored interactions with stakeholders took place throughout the project at relevant times, including the production of collaborator feedback reports for the HomeLabs, meetings with public sector actors and presentations to stakeholder meetings, such as Environment Ireland 2015.

CONSENSUS outputs have been cited in policy documents such as the NESC reports to government entitled “Climate Change Policy Review” and “Towards Ireland’s Low Carbon Future” (2013), which fed directly into the Climate Action and Low Carbon Development Bill (Government of Ireland, 2015). In addition, four CONSENSUS publications are cited in the NESC document “Social and Behavioural Aspects of Climate Change” published in December 2012. Moreover, CONSENSUS team members have been invited as panellists on the NESC Roundtable on the Challenge of Environmental Policy Integration.

An important part of the communications component of CONSENSUS II was the project website and its associated 90+ blogs, 2763 Twitter followers, 8105 YouTube hits and also 92 project outputs, including 14 papers, 18 reports and 41 presentations during phase II of CONSENSUS. The CONSENSUS team has also taken up serendipitous opportunities for creating additional value. For example, key outputs of the project have been made available through open access, ensuring that everyone can access the findings of the research. Furthermore, participation in public science communication activities has widened the reach of the research far beyond the scope that was originally envisaged. Another example is the HOME\SICK Exhibition within the Science Gallery, which was curated by Davies and which included the WASHLab interactive installation designed specifically to test washing typologies

identified within HomeLabs. A total of 2149 people completed the survey that formed part of the installation and they were able to watch a digital video that was tailored to suggest mechanisms to reduce the water use intensity of their everyday personal washing activities (Davies *et al.*, 2015b).

5.3 Conclusions and Recommendations

The CONSENSUS project has demonstrated that consumption is a complex, multi-layered practice, which is shaped by societal norms and individual ethics, as well as by wider structural and infrastructural enablers and pinch-points. As a result, there is no "ideal model" for sustainable consumption policy. A multi-faceted approach is required in order to respond to particular contexts, life stages and consumption practices. For example, transforming everyday habitual behaviour such as personal washing will require a different approach to occasional consumption, such as purchasing a new shower. Equally, responsibility for the development of consumption-related policy needs to be cross-departmental.

Recommendation: An inter-departmental working group focused on sustainable consumption should be established to explore the nexus dimension of household consumption.

It is important to recognise that not everyone is able to make changes to their consumption patterns in equal measures even if they would wish to do so. It is essential that any consumption related regulation is therefore future-proofed to ensure it is not socially regressive. Policy can assist in enabling more sustainable consumption practices, but, in isolation, it is unlikely to create the systematic changes in consumption necessary to keep within planetary boundaries. CONSENSUS has initiated important work in the field of sustainable household consumption in Ireland and beyond, but further investment in ongoing collaborative and transdisciplinary research is still required. Such work is challenging, given the different drivers and agendas of academic, public, private and civil society sectors, but it is nonetheless essential if impacts are to be maximised. Opportunities and spaces for collaborative work need to be created to support this endeavour and optimise the possibility for aligning regulatory, educational and technological innovations for more sustainable household consumption. For example, clear opportunities exist to synthesise conceptual and methodological developments across the fields of mobilities, transport planning and sustainable consumption, to conduct comparative international research in mobility biographies and to extend current research into new areas, such as air travel, car sharing or novel forms of technology-aided public transport.

Recommendation: Public and private partnerships to co-fund specific research facilities should be developed. An example would be the development of a transdisciplinary hub for consumption change experiments like the MIT PlaceLab and Open AG.

There is a clear need for research to evaluate the benefits of adopting segmentation and whether or not certain segments respond better to particular sustainable consumption messages. One potential research avenue is the selection of the most promising segments within their different target groups and to design innovative co-created solutions for them, such as marketing campaigns alongside appropriate supporting or enabling devices, skills and understandings. The results derived from this second phase of CONSENSUS have the potential to (1) feed into the development of new sustainable consumption interventions; (2) to develop new elements for already existing strategies; and (3) to inform existing materials and campaigns. Devising interventions to target specific values or attitudes alongside the necessary other supports increases the likelihood of initiatives being successful and more cost effective. Segmentation marketing is a decidedly new approach in many countries, with Ireland being no exception, and it therefore needs further exploration.

Recommendation: Further research must be undertaken to evaluate the impact of tailored sustainable consumption interventions.

Further study and evaluation of the typologies developed in CONSENSUS in a practical setting are required in order to employ academic knowledge and understanding within the field of pro-environmental behaviour change and to be able to apply this to emergent co-creation and social marketing techniques to tackle household consumption behaviours. Such qualitative research would shift the focus from "Snapshot Empiricism" of segment groupings to focus on "Pro-Active Co-Creation" of pro-environmental behaviour change (see Barr *et al.*, 2013) and the development of interventions tailored to the self-reported needs of specific segment groupings. Such research

would demonstrate the value of co-creation as a process of unpacking and understanding the motivations and barriers for particular consumer segments for changing behaviours and illustrate the potential for knowledge exchange between academic researchers, policymakers and behavioural change practitioners. The findings in this report suggest that social marketing and segmentation approaches may add knowledge to the answers of some central questions in the theoretical field of environmental behaviour. The results presented in this report indicate that policymakers should consider focusing on specific lifestyle groupings with regard to environmental behaviour change and potential future research avenues.

Recommendation: Further longitudinal testing and evaluation of the CONSENSUS typologies that were developed should be conducted.

Adopting a life-course approach would represent a major step change in consumption policy, which often indiscriminately targets individuals' behaviour regardless of their life course position. For example, CONSENSUS II's transport and mobilities research found that travel behaviour in the period of being between 20 and 30 years old is particularly dynamic. This provides major opportunities for policy-induced behavioural shifts. Moreover, particular life events, such as the arrival of the first child, residential relocation, or retirement, fundamentally influence mobility choices and everyday travel routines, warranting further research in this area. This in turn offers major opportunities to tailor policies and interventions to these "windows of opportunity" for behaviour change. Here, other European countries offer good practice examples for policy development and practice, such as through the delivery of transport network information packs and free public transport tickets to all newly registered residents in cities with diverse public transport, walking and cycling options, or shopping advice and consumer protection information for retirees.

Recommendation: A life-course approach to policy research, development and implementation across all areas of consumption should be adopted.

Major consumption decisions, such as the purchase of a house or car, initiate entire chains of consumption events, with significant consequences for society and the environment. For example, decisions regarding residential location, house size and type of dwelling create lasting legacies regarding resource consumption that can stretch across generations. Moreover, increasing structural "lock in" of particular chains of consumption events serve to caution against unrealistic expectations of immediate and radical transformation towards sustainable behaviour. This is highly relevant for sustainable consumption policy, pointing towards the need to target significant purchasing events. Importantly, the nature, extent and lifespan of these chains remains poorly understood, highlighting the necessity for further large-scale longitudinal and retrospective research in this area.

Recommendation: Further research and policy efforts should focus on major consumption milestones and their long-term effects.

There is a clear need to ensure a "beyond efficiency" and "beyond consumption" perspective regarding future research programmes examining behaviour change. Resource efficiency is a necessary, but alone insufficient, mechanism to ensure consumption is sustainable in the long term. Investment in research examining the practice of, and potential for, a more circular economy is required and more evaluative work should examine the impacts of emergent developments in collaborative consumption activities.

Recommendation: Research investment should be extended further in important emerging areas, such as collaborative consumption and the circular economy.

Ultimately, contradictions in policies between those designed to stimulate consumption as a means to trigger economic growth and those intended to reduce environmental impact must be laid bare, acknowledged and debated. Important relations of trust between producers, consumers and regulators are unlikely to be developed in the absence of this. Defensible data on the impacts of our consumption must be made public and accessible in order to make inroads into the decoupling of economic activity from negative environmental and social consequences. True cost accounting must ensure that the impacts of goods, services and products developed overseas but consumed within Ireland are fully accounted for in any analysis of consumption impacts.

Recommendation: Contradictory policies across government must be identified and contradictions resolved to develop more coherent and defensible action for more sustainable consumption.

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Abbreviations

CONSENSUS	Consumption, Environment and Sustainability
DEFRA	Department for Environment, Food & Rural Affairs
EPA	Environmental Protection Agency
MBR	Mobility biographies research
MIT	Massachusetts Institute of Technology
NESC	National Economic and Social Council
NGO	Non-governmental organisation
NUI	National University of Ireland
PT	Public transport
SC	Sustainable consumption
SCORAI	Sustainable Consumption Research and Action Initiative
SCP	Sustainable consumption and production
SCP AP	Sustainable Consumption and Production Action Plan
SDAS	Sustainable Dairy Assurance Scheme
SRHI	Self-reported Habit Index
UNEP	United Nations Environment Programme
WP	Work package

Appendix 1 CONSENSUS II Structure, 2014–2015

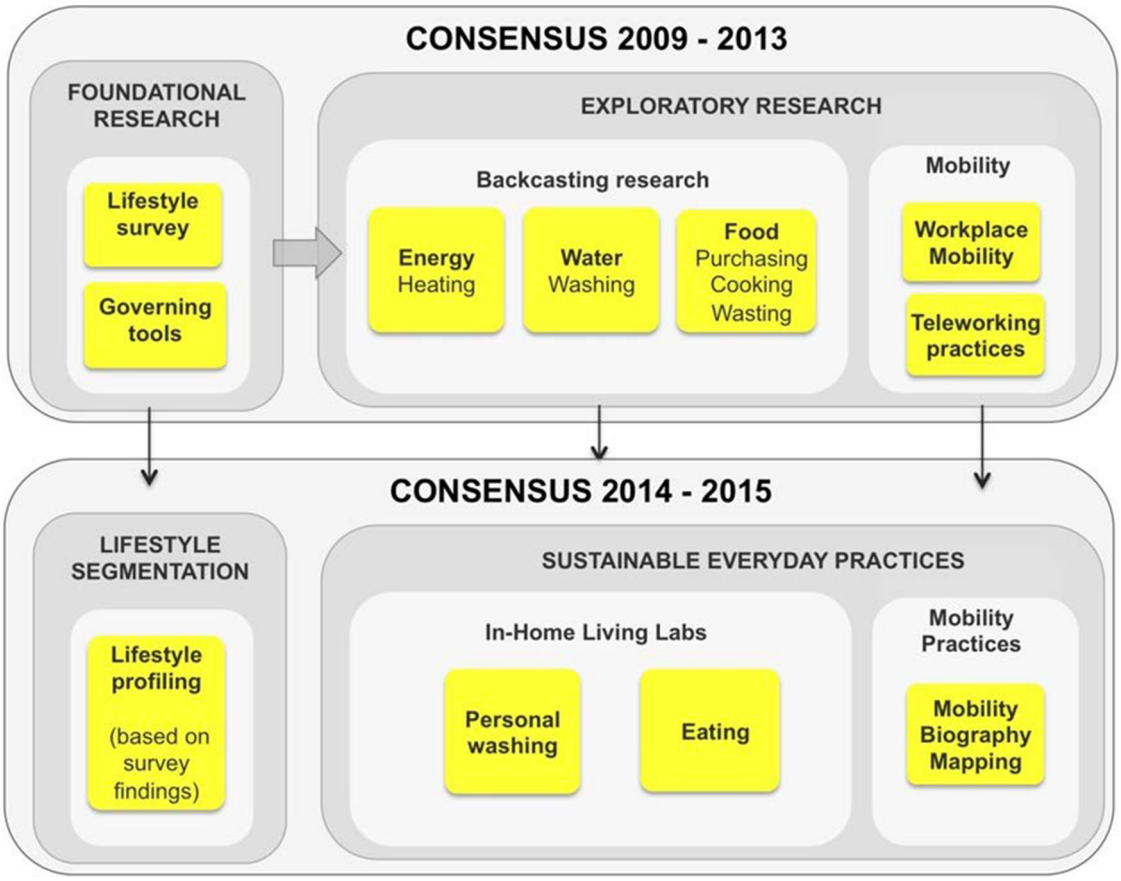

Figure A1.1. CONSENSUS II structure, 2014–2015.

Appendix 2 CONSENSUS II Outputs, 2014–2015

WP1 – Segmenting for Sustainability on the Island of Ireland

Dr Frances Fahy and Dr Mary Jo Lavelle

Publications

Carroll, B. and Fahy, F., 2014. Locating the locale of local food: the importance of context, space and social relations. *Renewable Agriculture and Food Systems*. DOI: 10.1017/S1742170514000404.

Lavelle, M.J., Rau, H. and Fahy, F., 2015. Different shades of green? Unpacking habitual and occasional pro-environmental behaviour. *Global Environmental Change* 35: 368–378.

Lavelle, M.J. and Fahy, F., forthcoming. What's consuming Ireland? Exploring expressed attitudes and reported behaviours towards the environment, quality of life and sustainable consumption on the island of Ireland. *Irish Geography* (in press).

Reports and policy briefs

Carroll, B. and Fahy, F., 2015. *Greening Ireland*? National Economic and Social Research Council (NESC), Dublin.

Fahy, F., 2015. Participatory action research in environmental and ecological studies. In Wright, J. (ed.), *International Encyclopaedia of Social and Behavioural Sciences*, 2nd Edition. Elsevier, UK.

Fahy, F. and Lavelle, M.J., 2016. *Segmenting for Sustainability across the Island of Ireland*. Whitaker Institute Policy Brief Series 1. Ireland: Centre for Environment, Development and Society, NUI Galway.

Lavelle, M.J. and Fahy, F., 2015. *From "Ever-Greens to Never-Greens" – Segmenting for sustainability across the island of Ireland*. Environmental Protection Agency, Johnstown Castle, Ireland.

Lavelle, M.J. and Fahy, F., 2015. *Temporal Dimensions of Environmental Behaviour: A Briefing Note on Innovative Segmentation Approaches to Environmental Behavioural Change across the Island of Ireland*. Environmental Protection Agency, Johnstown Castle, Ireland.

Lavelle, M.J. and Fahy, F., 2015. *Towards Sustainability: Overview of Household Consumption Trends for Water, Energy, Food and Transport in the Republic of Ireland and Northern Ireland*. Environmental Protection Agency, Johnstown Castle, Ireland.

Presentations

Davies, A.R. and Fahy, F., 2015. CONSENSUS: domesticating sustainability transitions. Presentation for Sustainable Consumption Institute Seminar Series, Manchester, 21 October 2015.

Fahy, F., 2014. Action: roles for researchers and practitioners in developing and diffusing sustainable practices. Presentation for the SCORAI (Europe)/Kingston University Sustainable Consumption Workshop, London, 30 September 2014 (discussant for session).

Fahy, F., 2014. Communicating sustainability research – challenges, opportunities and dissemination strategies. Presentation for the Association of American Geography Annual Meeting, Tampa Bay, FL, USA, 9 April 2014.

Fahy, F., 2014. Communicating sustainability research presentation. Presentation for Social Science and Policy Studies programme faculty and students at Worcester Polytechnic Institute (WPI), Worcester, MA, USA, 8 May 2014.

Fahy, F., 2014. Towards an energy hierarchy. Presentation for the Sustainable Consumption Problem Framing and Research Design Workshop, Lausanne, Switzerland, 8 December 2014.

Fahy, F., 2014. Sustainable consumption research in Ireland. Presentation for three-hour workshop and research presentation. Clark University, Worcester, MA, USA, 30 April 2014.

Fahy F., 2015. Key Findings from the CONSENSUS project. Presentation for Geography Department, Ludwig-Maximillian-University of Munich, Munich, Germany, 4 December 2015.

Fahy, F., 2015. Sustainable consumption in Ireland. Environment Ireland 11th Annual Conference. Croke Park, 16 September 2015 (invited presenter).

Fahy, F., 2015. Where do we go from here? The future for Irish Environmental Data. NESC Environmental Data: Priorities and Innovation Conference, 24 April 2015 (invited panelist).

Fahy, F. and Lavelle, M.J., 2015. From ever-greens to never-greens: segmenting for sustainability on the island of Ireland. CONSENSUS II International Conference on Sustainable Consumption Transformations, National University of Ireland, Galway, Ireland, 21 May 2015.

Fahy, F., Lavelle, M.J. and Rau, H., 2016. What's in a label? Examining "ever-greens" and "never-greens" on the Island of Ireland. Presentation for Association of American Geographers, San Francisco, CA, 29 March–2 April 2016.

Greene, M., Rau, H. and Fahy, F., 2014. Mobilizing memories: researching mobility practices over the life course. Presenation for SCORAI (Europe)/Kingston University Sustainable Consumption Workshop, London, 1 October 2014.

Lavelle, M.J., 2015. Sustainable consumption and waste. Presentation for Professional Development Conference, Leave No Trace, Ireland. Slieve Aughty Centre, Loughrea, Ireland, 28 November 2015, (invited presenter and discussant).

Lavelle, M.J., 2015. Transitions towards sustainable consumption. School of Natural Sciences 3rd Annual Lightning Talks Seminar, Trinity College Dublin, Dublin, October 2015.

Conference contributions

Fahy, F. and Lavelle, M.J., 2015. Conference organising committee chairperson. CONSENSUS International Conference on Sustainable Consumption, NUI Galway, Galway, Ireland, 21–23 May 2015.

Lavelle, M.J., 2015. Perspectives on sustainable consumption and behavioural change. CONSENSUS International Conference on Sustainable Consumption. NUI Galway, Galway, Ireland, 21–23 May 2015 (session chair).

Lavelle, M.J. and Barr, S., 2015. Behaviour change in the Anthropocene: charting new pathways towards sustainability. RGS-IBG Annual International Conference 2015, Geographies of the Anthropocene, University of Exeter, Exeter, UK, 1–4 September 2015 (session chair).

Lavelle, M.J. and Fahy, F., 2015. Conference organising committee chairperson. The 7th SCORAI European Workshop, NUI Galway, Galway, Ireland, 23 May 2015.

Collaboration

Lavelle, M.J., Fahy, F. and Wooliscoft, B., 2015. Consultation meeting to review WP1 progress. National University of Ireland, Galway, Ireland, 20 May 2015. [Professor Wooliscroft's (University of Otago, New Zealand) expertise lies with segmentation analysis undertaken with "Material Culture's Energy Project" in the New Zealand context].

Lavelle, M.J. and Fahy, F., 2015. Hosted and advised two international academics – Dr Erika Wolters (Oregon State University) and Dr Donna Lybecker (Idaho State University) – who have expressed interest in collaborating with CONSENSUS. Lavelle and Fahy are advising and directing the team of researchers (under Dr Wolters and Dr Lybecker) at Oregon State University currently involved in implementing the CONSENSUS Lifestyle Survey tool in the Pacific North West, USA to generate comparative data.

Fahy, F., Rau, H. and Lavelle, M.J., 2014. Hosted Professor Janet Stephenson from University of Otago, New Zealand, as part of CEDS International Guest Speaker Series (2014). Professor Stephenson presented a paper entitled "Energy Cultures – a multi-scalar framework to support interdisciplinary research on energy behaviour", National University of Ireland, Galway, Ireland. 17 September 2014.

Other

Fahy, F., 2015. Participatory Action Research in Environmental and Ecological Studies. In Wright, J. (ed.), *International Encyclopaedia of Social and Behavioural Sciences.* 2nd Edition. Elsevier, Oxford.

Awards

Shortlisted for Geographical Society of Ireland's Book of the Year Award, May 2014. Fahy, F. and Rau, H., 2013. *Methods of Sustainability Research in the Social Sciences.* SAGE, London.

Dr Frances Fahy was awarded the "Tom Jones Hughes Award" for Geography Research Article, 26 November 2014, presented by the AGTI in Trinity College Dublin, Dublin.

Educational and civic outreach

Public Lecture, Fahy, F., Rau, H. and Lavelle, M.J., 2015. Hosted Professor Martina Schäfer (CONSENSUS Advisory board member) from Technische Universität Berlin, Germany. Professor Schäfer presented a paper entitled "'Consumption messages to take away' – Results of inter- and transdisciplinary research program on Sustainable Consumption", National University of Ireland, Galway, Ireland, 22 May 2015.

Dr Frances Fahy appeared on Galway Bay FM to discuss the CONSENSUS Conference in May 2015.

Public Lecture, Fahy, F and Lavelle, M.J., 2015. What's consuming Ireland? Exploring expressed attitudes and reported behaviours towards the environment, quality of life and consumption on the island of Ireland. School of Geography and Archaeology Springtime Lecture Series, Galway City Museum, Galway City, 6 February 2015.

Frances Fahy and Henrike Rau developed a Podcast on *Challenging Consumption* in association with the Ryan Institute, NUI Galway in January 2015. News and review article in Galway City Tribune on 6 February 2015. Available online: http://www.nuigalway.ie/ryaninstitute/educationoutreach/ryaninstituteradio/

Horizon 2020 proposal, Fahy, F. and Hynes, M., 2015. Produced and submitted a proposal for Horizon 2020 entitled "Greening for good: exploring environmental behaviour in the workplace". This project has two international partners – University of Riga, Latvia and University of Lausanne, Switzerland. (Submission date was April 2015).

Lecture, Lavelle, M.J., 2015. CONSENSUS project design and methodologies. Lecture to second year Geography students (enrolled 240 students). National University of Ireland, Galway, Ireland, February 2015.

Public Lecture, Lavelle, M.J., 2014. Behavioural Geography Research: Sustainable Household Consumption. Geography in Practice: Introduction to Geographical Research. National University of Ireland, Galway, Ireland, 2–3 September 2014.

Frances Fahy and Henrike Rau co-hosted a Public Lecture by Professor Janet Stephenson (Advisory board member) from University of Otago, New Zealand, as part of CEDS International Guest Speaker Series (2014). Professor Stephenson presented a paper entitled "Energy Cultures – a multi-scalar framework to support interdisciplinary research on energy behaviour", National University of Ireland, Galway, Ireland, 17 September 2014.

Drawing on the outputs of WP1 two additional PhD students conducted their PhD research under the supervision of Frances Fahy

Carroll, B., 2014. The Nature of Food Localisms among Consumers in Ireland: Defensive politics, sustainability and reflexivity. PhD Thesis. NUI Galway, Galway, Ireland.

Mary Greene (PhD Candidate) Started September 2011 (Recipient of Hardiman and IRC Scholarships).

WP2 – Homelabs

Professor Anna Davies, Dr Laura Devaney, Dr Ruth Doyle and Dr Mary Jo Lavelle

Publications and reports

Davies, A.R., 2015. SICK/HOME/SICK Curators Essay. HOME\SICK catalogue. Science Gallery: Trinity College Dublin, Dublin, Ireland.

Davies, A.R. and Doyle, R., 2015. Transforming household consumption: from backcasting to HomeLabs experiments. *Annals of the Association of American Geographers* 105: 425–436.

Davies, A.R. and Doyle, R., 2015. Waterwise: extending civic engagements for co-creating more sustainable washing futures. *ACME: An International Journal for Critical Geographies* 14: 390–400.

Davies, A.R. and Lavelle, M.J., 2015. *Eating HomeLabs: Longitudinal Impact High Level Findings*. Trinity College Dublin, Dublin, Ireland.

Davies, A.R. and Lavelle, M.J., 2015. *Washing HomeLabs: Longitudinal Impact High Level Findings*. Trinity College Dublin, Dublin, Ireland.

Davies, A.R., Lavelle, M.J. and Doyle, R., 2015. *WASH-Lab: Data Analysis Summary*. Trinity College Dublin, Dublin, Ireland.

Devaney, L., 2014. Food risk in Ireland: consumer perceptions, trust and dependence. *Irish Geography* 47: 33–50.

Devaney, L., 2015. *HomeLabs: Eating Summary Report*. Trinity College Dublin, Dublin, Ireland.

Devaney, L. and Davies, A.R., forthcoming. Disrupting household food consumption through experimental HomeLabs: outcomes, connections, contexts. *Journal of Consumer Culture* (in press).

Devaney, L., Doyle, R. and Davies, A., 2014. *Change Labs: Sites of Experimentation for Sustainable Living*. CONSENSUS Briefing Note 1. Trinity College Dublin, Dublin, Ireland.

Doyle, R., 2014. *HomeLabs: Washing Summary Report*. Trinity College Dublin, Dublin, Ireland.

Luederitz, C., Schäpke, N., Wiek, A., Lang, D.J., Bergman, M., Bos, J.J., Burch, S., Davies, A., Evans, J., König, A., Farrelly, M., Forrest, N., Frantzeskaki, N., Gibson, R., Kay, B., Loorbach, D., McCormick, K., Parod, O., Rauschmayer, F., Schneidewind, U., Stauffacher, M., Stelzer, F., Trencher, G., Venjakob, J., Vergragt, P.J., Von Wehrden, H. and Westley, F. R., 2016. Joint Learning through evaluation – a tentative evaluative scheme for sustainability transition experiments. *Environmental Innovation and Societal Transitions*.

Presentations and panels

Davies, A., 2014. HomeLabs: from scenario to intervention for more sustainable consumption. Presentation for Geography Seminar Series 2014–15, National University of Ireland, Maynooth, Kildare, Ireland, 13 November 2014.

Davies, A., 2014. Living with strange weather: Ireland in 2050. Science Gallery Strange Weather Event, Dublin, 13 March 2014.

Davies, A., 2014. Strange Weather Panel: Red Line Literary Festival. Presentation for Dublin, October, 2014.

Davies, A., 2014. The future of food. Presentation for long-term forecasts for food and agriculture, OECD, Paris, September 2014.

Davies, A., 2014. Geographies of food. Presentation for International Geography Awareness Week, Trinity College Dublin, Dublin, Ireland, November 2014 (chair of panel).

Davies, A.R., 2015. A case for heating HomeLabs, from niche to normal: driving energy efficiency through behavioural change. Presentation for SEAI Conference, 5 November 2015.

Davies, A.R., 2016. HomeLabs: domestic living laboratories under conditions of austerity. Presentation for Urban Living Labs workshop, Durham University, Durham, February 2016.

Davies, A.R. and Fahy, F., 2015. CONSENSUS: domesticating sustainability transitions. Presentation for Sustainable Consumption Institute Seminar Series, Manchester, October 2015.

Davies, A.R., Doyle, R. and Devaney, L., 2015. HomeLabs: experiments in sustainable living. Presentation for CONSENSUS II Conference, National University of Ireland, Galway, Ireland, May 2015.

Devaney, L., 2014. Food futures on a plate. Geoweek Panel Discussion, National University of Ireland, Galway, Ireland, 19 November 2014 (invited panellist).

Devaney, L., 2014. Geographies of good food risk governance: public perceptions and the paradox of progress. Presentation for Conference of Irish Geographers 2014, University College Dublin, Dublin, Ireland, 8 May 2014.

Devaney, L., 2014. Local to Global Food Waste. Trinity College Environmental Society Debate, Trinity College Dublin, Dublin, Ireland, 11 November 2014 (chair of panel debate).

Devaney, L., 2014. Participative methods in sustainable consumption research. Presentation for SCORAI workshop on sustainable consumption problem framing and research design, University of Lausanne, Switzerland, 8 December 2014.

Devaney, L., 2014. Testing transitions: from promising practices to HomeLabs for more sustainable eating. Presentation for Conference of Irish Geographers 2014, University College Dublin, Dublin, Ireland, 8 May 2014.

Devaney, L., 2014. The risks of participative methods. SCORAI special session on bringing participative methods to life. University of Lausanne, Switzerland, 10 December 2014 (invited panellist).

Doyle, R., 2014. Changing behaviour and attitudes towards water use: a question of habit. Water Ireland Conference, Ashbourne, Ireland, 27 March 2014.

Doyle, R., 2014. Shaping consumer habits: insights from social science. Sustainability Communications Forum, London, 22 May 2014.

Stakeholder engagement and communications

- Development of strategic partnership network: 11 public, private and civil society actors involved in the final delivery of the Eating HomeLabs.
- Six Eating HomeLab collaborator reports: developed and communicated to corporate partners, highlight ideas for future product development and appropriate future collaborations.
- CONSENSUS Briefing Note 1 disseminated to over 200 stakeholders in October 2014.
- Submission to consultation on Sustainable Development Goals organised by the Sustainable Development Solutions Network (AD).
- A.R. Davies curated the HOME\SICK Exhibition, Science Gallery Dublin, 30 April–1 July 2015.
- A.R. Davies and R. Doyle developed the WASHLab exhibit for HOME\SICK Exhibition in 2015.

Other outputs and impact

- Social media: blog posts
  - 8 blogs on CONSENSUS website (RD, AD);
  - 8 blogs on PlanetGeog Blog@TCD (AD, RD, LD, MJL);
  - 1 international blog on HomeLabs for Future Earth blog "All Change: Experiments in sustainability transformations" (AD, RD, LD).
- Encyclopaedia entry
  - Davies, A.R. (2014) "Environmental Futures", The International Encyclopaedia of Geography: People, the Earth, Environment, and Technology.
- Awards
  - Laura Devaney was awarded Geographical Society of Ireland Doctoral Research Award 2014; chosen by an international judging panel of five academics.

WP3 – Mobility Biographies and Milestones

Professor Henrike Rau and Richard Manton

Publications and reports

Heisserer, B. and Rau, H., 2015. Capturing the consumption of distance? From practice theory to the empirical investigation of everyday travel. *Journal of Consumer Culture*. DOI: 10.1177/1469540515602304.

Manton, R. and Rau, H., 2016. The missing link: connecting mobility biographies and histories of mobility practices. *Mobilities* (submitted for peer review in November 2015).

Rau, H. and Manton, R., 2015. *Mobility Biographies and Milestones*. Consensus Briefing Note No. 3. Environmental Protection Agency, Johnstown Castle, Ireland.

Rau, H. and Manton, R., 2016. Life events and mobility milestones: advances in mobility biography theory and research. *Journal of Transport Geography* 52: 51–60.

Presentations

Manton, R. and Rau, H., 2015. Mobility biographies and milestones: key concepts, methodological innovation and initial insights. Presentation for Royal Geographical Society – Institute of British Geographers (RGS-IBG) Annual International Conference, University of Exeter, Exeter, 1–4 September 2015.

Manton, R. and Rau, H., 2015. Mobility biographies and milestones: lessons for sustainable transport in Ireland. Presentation for 6th Irish Transport Research Network (ITRN) Conference, National University of Ireland, Galway, Ireland, 27–28 August 2015.

Manton, R. and Rau, H., 2015. Mobility biographies and milestones: a review of existing evidence and a proposal for a new methodology. Presentation for 14th International Conference on Travel Behaviour Research (ICTBR), Windsor, UK, 19–24 July 2015.

Manton, R. and Rau, H., 2015. Mobility biographies and milestones: key concepts, methodological innovation and initial insights. Presentation for 2nd Consumption, Environment and Sustainability (CONSENSUS) Conference, National University of Ireland, Galway, Ireland, 21–22 May 2015.

Manton, R. and Rau, H., 2015. Mobility biographies and milestones: lessons for sustainable transport in Ireland. Presentation for 25th Irish Environmental Researcher's Colloquium, Institute of Technology Sligo, Sligo, Ireland, 8–10 April 2015.

Rau, H., 2014. Mapping the consumption of distance across the life course: linking individual's mobility milestones and the history of mobility practices. ISA World Congress of Sociology, Yokohama, Japan, 13–19 July 2014.

Publicity, impact and outreach

- International mobility research experts (BE, DE, UK) contributed to the pilot phase of the study.
- National transport organisations were engaged in survey design and promotion.
- Richard Manton appeared on *Galway Bay FM* to discuss this research and to promote the survey.
- The team used social media to promote the survey and to engage the public.
- The project was showcased in *Research Matters*, the NUI Galway Research Office magazine.
- This WP enabled significant collaboration between NUI Galway and Ludwig-Maximillian University of Munich.

AN GHNÍOMHAIREACHT UM CHAOMHNÚ COMHSHAOIL
Tá an Ghníomhaireacht um Chaomhnú Comhshaoil (GCC) freagrach as an gcomhshaol a chaomhnú agus a fheabhsú mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ó éifeachtaí díobhálacha na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialú: *Déanaimid córais éifeachtacha rialaithe agus comhlíonta comhshaoil a chur i bhfeidhm chun torthaí maithe comhshaoil a sholáthar agus chun díriú orthu siúd nach gcloíonn leis na córais sin.*

Eolas: *Soláthraímid sonraí, faisnéis agus measúnú comhshaoil atá ar ardchaighdeán, spriocdhírithe agus tráthúil chun bonn eolais a chur faoin gcinnteoireacht ar gach leibhéal.*

Tacaíocht: *Bímid ag saothrú i gcomhar le grúpaí eile chun tacú le comhshaol atá glan, táirgiúil agus cosanta go maith, agus le hiompar a chuirfidh le comhshaol inbhuanaithe.*

Ár bhFreagrachtaí

Ceadúnú
Déanaimid na gníomhaíochtaí seo a leanas a rialú ionas nach ndéanann siad dochar do shláinte an phobail ná don chomhshaol:
- saoráidí dramhaíola *(m.sh. láithreáin líonta talún, loisceoirí, stáisiúin aistrithe dramhaíola)*;
- gníomhaíochtaí tionsclaíocha ar scála mór *(m.sh. déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta)*;
- an diantalmhaíocht *(m.sh. muca, éanlaith)*;
- úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe *(OGM)*;
- foinsí radaíochta ianúcháin *(m.sh. trealamh x-gha agus radaiteiripe, foinsí tionsclaíocha)*;
- áiseanna móra stórála peitril;
- scardadh dramhuisce;
- gníomhaíochtaí dumpála ar farraige.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil
- Clár náisiúnta iniúchtaí agus cigireachtaí a dhéanamh gach bliain ar shaoráidí a bhfuil ceadúnas ón nGníomhaireacht acu.
- Maoirseacht a dhéanamh ar fhreagrachtaí cosanta comhshaoil na n-údarás áitiúil.
- Caighdeán an uisce óil, arna sholáthar ag soláthraithe uisce phoiblí, a mhaoirsiú.
- Obair le húdaráis áitiúla agus le gníomhaireachtaí eile chun dul i ngleic le coireanna comhshaoil trí chomhordú a dhéanamh ar líonra forfheidhmiúcháin náisiúnta, trí dhíriú ar chiontóirí, agus trí mhaoirsiú a dhéanamh ar leasúchán.
- Cur i bhfeidhm rialachán ar nós na Rialachán um Dhramhthrealamh Leictreach agus Leictreonach (DTLL), um Shrian ar Shubstaintí Guaiseacha agus na Rialachán um rialú ar shubstaintí a ídíonn an ciseal ózóin.
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Uisce
- Monatóireacht agus tuairisciú a dhéanamh ar cháilíocht aibhneacha, lochanna, uiscí idirchriosacha agus cósta na hÉireann, agus screamhuiscí; leibhéil uisce agus sruthanna aibhneacha a thomhas.
- Comhordú náisiúnta agus maoirsiú a dhéanamh ar an gCreat-Treoir Uisce.
- Monatóireacht agus tuairisciú a dhéanamh ar Cháilíocht an Uisce Snámha.

Monatóireacht, Anailís agus Tuairisciú ar an gComhshaol
- Monatóireacht a dhéanamh ar cháilíocht an aeir agus Treoir an AE maidir le hAer Glan don Eoraip (CAFÉ) a chur chun feidhme.
- Tuairisciú neamhspleách le cabhrú le cinnteoireacht an rialtais náisiúnta agus na n-údarás áitiúil *(m.sh. tuairisciú tréimhsiúil ar staid Chomhshaol na hÉireann agus Tuarascálacha ar Tháscairí)*.

Rialú Astaíochtaí na nGás Ceaptha Teasa in Éirinn
- Fardail agus réamh-mheastacháin na hÉireann maidir le gáis cheaptha teasa a ullmhú.
- An Treoir maidir le Trádáil Astaíochtaí a chur chun feidhme i gcomhair breis agus 100 de na táirgeoirí dé-ocsaíde carbóin is mó in Éirinn.

Taighde agus Forbairt Comhshaoil
- Taighde comhshaoil a chistiú chun brúnna a shainaithint, bonn eolais a chur faoi bheartais, agus réitigh a sholáthar i réimsí na haeráide, an uisce agus na hinbhuanaitheachta.

Measúnacht Straitéiseach Timpeallachta
- Measúnacht a dhéanamh ar thionchar pleananna agus clár beartaithe ar an gcomhshaol in Éirinn *(m.sh. mórphleananna forbartha)*.

Cosaint Raideolaíoch
- Monatóireacht a dhéanamh ar leibhéil radaíochta, measúnacht a dhéanamh ar nochtadh mhuintir na hÉireann don radaíocht ianúcháin.
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha.
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta.
- Sainseirbhísí cosanta ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Faisnéis Inrochtana agus Oideachas
- Comhairle agus treoir a chur ar fáil d'earnáil na tionsclaíochta agus don phobal maidir le hábhair a bhaineann le caomhnú an chomhshaoil agus leis an gcosaint raideolaíoch.
- Faisnéis thráthúil ar an gcomhshaol ar a bhfuil fáil éasca a chur ar fáil chun rannpháirtíocht an phobail a spreagadh sa chinnteoireacht i ndáil leis an gcomhshaol *(m.sh. Timpeall an Tí, léarscáileanna radóin)*.
- Comhairle a chur ar fáil don Rialtas maidir le hábhair a bhaineann leis an tsábháilteacht raideolaíoch agus le cúrsaí práinnfhreagartha.
- Plean Náisiúnta Bainistíochta Dramhaíola Guaisí a fhorbairt chun dramhaíl ghuaiseach a chosc agus a bhainistiú.

Múscailt Feasachta agus Athrú Iompraíochta
- Feasacht chomhshaoil níos fearr a ghiniúint agus dul i bhfeidhm ar athrú iompraíochta dearfach trí thacú le gnóthais, le pobail agus le teaghlaigh a bheith níos éifeachtúla ar acmhainní.
- Tástáil le haghaidh radóin a chur chun cinn i dtithe agus in ionaid oibre, agus gníomhartha leasúcháin a spreagadh nuair is gá.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil
Tá an ghníomhaíocht á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóirí. Déantar an obair ar fud cúig cinn d'Oifigí:
• An Oifig um Inmharthanacht Comhshaoil
• An Oifig Forfheidhmithe i leith cúrsaí Comhshaoil
• An Oifig um Fianaise is Measúnú
• An Oifig um Cosaint Raideolaíoch
• An Oifig Cumarsáide agus Seirbhísí Corparáideacha
Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag comhaltaí air agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

EPA Research Report 205

CONSENSUS II: Segmentation, Experimentation and Biographies for Sustainability

Authors: Anna Davies, Frances Fahy, Henrike Rau, Laura Devaney, Ruth Doyle, Mary Jo Lavelle and Richard Manton

This research developed and tested three different ways to better understand and potentially transform household consumption: lifestyle segmentation, home-based living laboratories (HomeLabs) and mobility biographies.

Identifying Pressures

In 2015 a new global sustainable development agenda was agreed which placed responsibility on everyone, from governments and the private sector to civil society and citizens, to end poverty, protect the planet and ensure prosperity for all. Sustainable consumption, and by association sustainable production, will be essential to achieve these goals and will require action across scales from the global to the local, including households. The challenges of doing more and better with less must not be underestimated and will require new ways of living supported by social, technological, economic and environmental innovations. CONSENSUS II has identified pressure points where shifting consumption onto more sustainable pathways will be most challenging as well as opportunities to make positive changes.

Informing Policy

CONSENSUS II illustrates the diversity of factors that shape the way we consume. Through its careful analysis of diverse populations occupying different life stages in distinctive locations, CONSENSUS II highlights the importance of a co-ordinated and systematic approach to supporting sustainable consumption, from everyday habitual behaviours to the occasional or once-off purchases. Moreover, it identifies opportunities for cooperation among all actors involved in the production, distribution and consumption of goods. Here, policy remains a key means by which businesses can be facilitated to innovate for sustainable consumption and people can be incentivised to consume in ways which are less taxing on the environment.

Developing Solutions

This report highlights promising ways in which unsustainable consumption practices both in and beyond the home can be transformed through careful collection and analysis of data and the co-design of solutions that meet needs within planetary boundaries. There is no silver bullet for unsustainable consumption. However, CONSENSUS II illustrates how drawing on the resourcefulness and innovative potential of people from all sections of society in ways that acknowledge the diversity of lives and circumstances holds the greatest potential for achieving the new sustainable development goals.

EPA Research: McCumiskey House, Richiew, Clonskeagh, Dublin 14.

Phone: 01 268 0100
Twitter: @EPAResearchNews
Email: research@epa.ie

www.epa.ie

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