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Global Action for Sustainable Consumption and Production

10YFP

CONSUMING DIFFERENTLY, CONSUMING SUSTAINABLY: BEHAVIOURAL INSIGHTS FOR POLICYMAKING

UNITED NATIONS ENVIRONMENT

ideas 42

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ABOUT IDEAS42

ideas42 is a not-for-profit behavioural design and consulting firm. Our unique expertise and experience at the forefront of behavioural science help us to innovate, drive social change and improve millions of lives. ideas42 creates fresh solutions to tough issues based on behavioural insights that can be scaled up for the greatest impact. ideas42 also educates leaders and help institutions improve existing programmes and policies.

Our work spans more than 25 countries and encompasses economic mobility, health, education, consumer finance, criminal justice, energy efficiency and international development. Our partners include governments, foundations, companies and many other institutions around the world.

At its core, behavioural science helps us understand human behaviour and why people make the decisions they do. It teaches us that context matters, that asking the right questions is critical and that simple solutions are often available, but frequently overlooked or dismissed. At ideas42, we work to identify the subtle but important contextual details that can have a disproportionate impact on outcomes.

Contents

Executive Summary

Human demands on Earth's natural resources have outpaced what can be produced. A shift to more sustainable growth is dependent on changes in current patterns of both production and consumption. While recent policy has largely focused on addressing production and supply, consumption and demand must also be addressed. Today, in less than nine months, we consume more resources than our planet produces in a year, and our rate of consumption continues to grow[1]. We are in a time of flux in the world economy, where the growth of emerging economies is driving a rise in consumption across the globe. An increasing number of households in developing economies are joining the consuming class; experts estimate 2-3 billion additional middle-class consumers will be added by 2050[2].

This growth in demand and consumption of our planet's natural resources is unsustainable in the long term. Solving this problem is vital to the future of our and other species. As such, we must develop strategies to decouple economic growth and human wellbeing from the unsustainable use of natural resources[3]. In September 2015, this critical goal was reaffirmed by the international community at the UN Sustainable Development Summit, with the adoption of Agenda 2030 for Sustainable Development and the recognition of Sustainable Consumption and Production (SCP) as an essential building block across the Sustainable Development Goals (SDGs). The 10 Year Framework of Programmes on SCP patterns (10YFP), which brings together over 450 actors from all over the world, is an essential platform for action to support the achievement of the SDGs through the shift towards SCP in all countries. In view of the importance of behavioural insights for consumer information, this publication is developed in cooperation with the Consumer Information Programme for Sustainable Consumption and Production (CI-SCP) of the 10 Year Framework of Programmes on SCP[1].

[1] For more information, refer to the 10YFP website: http://www.unep.org/10yfp/Consumer

Each day, across the world, individuals make small choices and take small actions that have, as a whole, momentous impacts on our planet's natural resources.

The objective of this publication is to shed light on opportunities to strengthen the effectiveness of policies for sustainable consumption in both developed and developing countries. The publication provides evidence-based insights from behavioural science, detailing five key behavioural barriers to sustainable consumption. It also includes concrete examples of how behavioural science has been successfully coupled with policy to cost-effectively achieve sustainable consumption.

Today, inequalities in consumption exist across and within countries—with countries facing the simultaneous challenges of over and underconsumption. Keeping this reality in mind, the opportunities to shift consumer behaviour are immense. Each day, across the world, individuals make small choices and take small actions that have, as a whole, momentous impacts on our planet's natural resources. Policies that focus on shifting these everyday behaviours toward more sustainable outcomes are crucial to achieving more sustainable consumption patterns.

Yet changing human behaviour is often challenging. As humans, we do not always make standard decisions or behave in predictable ways. The field of behavioural science, which includes behavioural economics, psychology, and other social sciences, offers practical insights for designing policies that are better aligned with human decision-making processes. Behaviourally informed policy tools can help consumers better evaluate costs and benefits and act on their preferences, enhancing the effectiveness of government interventions[4],[5]. Already, an increasing number of governments, with developed countries taking the lead, are incorporating behavioural science into many aspects of their policymaking[6].

Understanding human behaviour is crucial to achieving sustainable consumption. For example, what might prevent an individual who generally understands the importance of sustainability, and has access to sustainable options, from shifting their behaviour? This phenomenon is seen in both developed and developing countries—despite knowing what is best for the wellbeing of themselves and their communities, many people do not take the optimal action[7]. Behavioural science demonstrates how the influence of context (mental, social, and physical) and the mental shortcuts used by the human mind can result in otherwise unpredictable outcomes in our individual behaviour.

This publication describes in detail the five following ways that behavioural barriers might affect decision-making about sustainable consumption:

The Consumer Information Programme for Sustainable Consumption and Production (CI-SCP) of the 10 Year Framework of Programmes on SCP supports the provision of quality information on goods and services, to engage consumers in sustainable consumption and make it easier for them to act on their sustainability intentions. Led by Germany, Indonesia, and Consumers International, the CI-SCP unites more than 70 actors worldwide, including governments, international organizations, NGOs and the private sector. The programme encourages collaboration between all stakeholders to both raise the profile of existing initiatives and identify and implement new policies, projects, and partnerships. Insights from behavioural science can play a key role in achieving more effective outcomes. Recognizing that the provision of reliable information does not necessarily lead to behavioural change, the CI-SCP aims to apply behavioural science to understand how consumers process, respond to, and share information to identify the drivers that lead from awareness to action. Policymakers, researchers, and practitioners of behavioural science are encouraged to use the programme to test or implement activities in this discipline.

Website: www.unep.org/10yfp/consumer

1. **Many "choices" in consumption are often habitual behaviours;**
2. **Consequences of consumption are often hard to see;**
3. **Sustainable consumption may not seem personally relevant;**
4. **Behaviour is influenced by peers and social groups; and**
5. **It can be hard to follow through on sustainable choices.**

To date, behavioural insights have disproportionately focused on developed countries, while there are many opportunities to apply behavioural insights in developing countries.

Designing policy and interventions to address these barriers can lead to cost-effective and practical solutions.

This report includes several examples of behavioural solutions successfully applied to key consumption areas, including energy, water, transportation and mobility, food and diet, and waste and disposal. There are many more opportunities to apply behavioural approaches to shift consumption patterns. For example, few behavioural applications have thus far focused on managing the unsustainable consumption of low-quality, disposable consumer goods. Even more critically, to date behavioural insights have disproportionately focused on developed countries, while there are many opportunities to apply behavioural insights in developing countries.

This publication ends with a call to action to policymakers and practitioners. It offers three broad recommendations to achieve better outcomes in sustainable consumption policy:

1. Incorporate behavioural science into policy processes and tools;
2. Build internal behavioural policy capacity within policymaking entities; and
3. Expand behavioural science research efforts and dissemination.

Achieving sustainable consumption will require great global effort—it is critical that we employ all of the tools at our disposal. By using the deep understanding of decision-making offered by behavioural science, policymakers can design more effective policies to shift consumption patterns and achieve the Sustainable Development Goals (SDGs).

SECTION 1 Introduction

SHIFTING CONSUMPTION PATTERNS IS VITAL TO A SUSTAINABLE FUTURE

Our demands on Earth's natural resources have outpaced what can be produced. Today, in less than nine months, we consume more resources than our planet produces in a year, and our demand on nature only continues to grow[1]. While the ecological footprint of developed countries is currently five times that of developing nations[8], the economic acceleration of leading emerging economies is ten times faster than the economic growth seen during the Industrial Revolution—and the economies themselves are 100 times the scale[9]. Experts estimate that there will be an additional 2 to 3 billion middle-class consumers by 2050[2], placing even more pressure on Earth's carrying capacity,[2] with increasing consumption of natural resources. Yet despite this growth, 1.2 billion people live on less than $1.25 a day, and 1.5 billion people live in multidimensional poverty[10].

For additional information on bolded terms throughout this paper, please refer to the Glossary in the appendix.

[2] Carrying capacity is defined as "the maximum population size of a given species that an area can support without reducing its ability to support the same species in the future."[93] Determining carrying capacity can be a challenge; there is "an incredible range to the estimates of Earth's carrying capacity, the greatest concentration of estimates falls between 8 and 16 billion people."[94]

Shifting towards more sustainable patterns of consumption and production is vital to the future of the planet.

Shifting towards more sustainable patterns of consumption and production is vital to the future of the planet, and policymakers have been aware of this fact for decades. At the 1994 Oslo Symposium, participants called for "minimizing the use of natural resources and toxic materials, as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations"[11]. Achieving this aim requires decoupling economic growth and human wellbeing from the unsustainable use of natural resources[3].

Changing consumption patterns is a crucial part of this challenge. While efforts are being made by many organizations to influence the way goods and resources are produced, priced, and distributed[3], production is only one side of the equation. People consume what is produced; producers supply what they believe consumers demand. Thus, addressing both supply and demand sides for sustainable goods and services in our marketplaces is necessary. Incorporating a more demand-oriented and consumer-focused approach in policy and governance frameworks is critical to encouraging more sustainable consumption patterns in practice.

Individual behaviour plays a significant role in consumption. The billions of small decisions that people all over the world make each day have, as a whole, momentous impacts. From purchasing food for family meals, to choosing whether we drive or take a bus to work; from turning up the heat to lowering the air conditioner; from letting the water tap run to sorting cans and bottles—all of these actions have consequences. But this also means that there are opportunities everywhere to move consumers towards more sustainable choices.

[3] The following are a few examples of the many efforts underway for more sustainable production, pricing, and distribution of goods and resources:

- **The Zero Discharge of Hazardous Chemicals (ZDHC)** initiative has developed a Global Roadmap for zero discharge of hazardous chemicals in the global textile and footwear industries to improve the environment and people's well-being, in partnership with global retail brands, United Nations, governments and more. Online at: http://www.roadmaptozero.com/cn/joint-roadmap/
- **The United Nations Global Compact** works with the private sector and governments to promote sustainable supply chains for goods and services. The Global Compact's Environmental Stewardship Strategy is designed to help companies develop a holistic and comprehensive strategy, in line with special principles for Food and Agriculture sectors and more. Online at: https://www.unglobalcompact.org/what-is-gc/our-work/environment
- **The Resource Efficient and Cleaner Production (RECP)** concept was introduced by UNIDO and UN Environment in 1995 to emphasize the contribution of preventive environmental management techniques to the productive use of natural resources, minimization of wastes and emissions, and human development. Online at: http://www.unido.org/en/what-we-do/environment/resource-efficient-and-low-carbon-industrial-production/cp/resource-efficient-and-cleaner-production.html
- **The Economics of Ecosystems and Biodiversity (TEEB)** is a global initiative focused on "making nature's values visible." Its principal objective is to mainstream the values of biodiversity and ecosystem services into decision-making at all levels. It aims to achieve this goal by following a structured approach to valuation that helps decision-makers recognize the wide range of benefits provided by ecosystems and biodiversity, demonstrate their values in economic terms and, where appropriate, capture those values in decision-making. Online at: http://www.teebweb.org/

What is Sustainable Consumption?

The definition of what constitutes "sustainable" consumption varies across economic sectors, countries and cultures. Still, there is a broad definition of "sustainable consumption" that was articulated at the 1994 Oslo Symposium: "the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials, as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations." This definition tells us that sustainable consumption implies not only purchasing behaviours, but includes all "lifestyle choices" between individuals and infrastructures (mobility, leisure, housing) in a society. Consumers include governments (from national to local levels), businesses, and end-consumers at the household and individual level.

What is Sustainable Consumption and Production (SCP)?

The linked concept of Sustainable Consumption and Production (SCP) was first acknowledged as a fundamental part of sustainable development at the 2002 World Summit on Sustainable Development. As a response to this, a consultative intergovernmental and multi-stakeholder process began to guide the implementation of SCP along thematic priority programmes. In 2012, the United Nations Conference on Sustainable Development (Rio+20) adopted the 10 Year Framework of Programmes (10FYP) on Sustainable Consumption and Production patterns (SCP), the United Nations Environment Programme (UN Environment) serving as its Secretariat. The 10YFP is a global framework of action to enhance international cooperation to accelerate the shift towards SCP in both developed and developing countries.

Is SCP part of the Sustainable Development Goals (SDGs)?

In 2015, with the adoption by UN Member States of the Sustainable Development Goals (SDGs) and the 2030 Agenda for Sustainable Development, SCP is also now a standalone goal. SDG 12 aims to "Ensure SCP Patterns" across developed and developing countries alike by 2030. Overall, SCP is a nexus point for this complex and interdependent agenda for sustainable development; not only is it the aim of SDG 12, it is also linked to 12 of the 17 SDGs. Ensuring behavioural changes for SCP can therefore help achieve targets across the SDGs.

The 10YFP Consumer Information Programme for SCP, led by Germany, Indonesia, and Consumers International, supports the provision of quality information on goods and services, to engage consumers in sustainable consumption and make it easier for them to act on their intentions. It encourages collaboration between all stakeholders to both raise the profile of existing initiatives and identify and implement new policies, projects, and partnerships. Insights from behavioural science can play a key role in achieving more effective outcomes. Recognizing that the provision of reliable information does not necessarily lead to behavioural change, the CI-SCP aims to apply behavioural science to understand how consumers process, respond to, and share information to identify the drivers that lead from awareness to action. Policymakers, researchers, and practitioners of behavioural science are encouraged to use the programme to test or implement activities in this discipline.

Consumer Information for SCP Programme of the 10YFP

For more information, please see: https://sustainabledevelopment.un.org/topics/sustainableconsumptionandproduction

CHANGING HUMAN BEHAVIOUR THROUGH POLICY IS CHALLENGING AND COMPLEX

Efforts to shift human behaviour—whether at the individual, household, or aggregate scale—can result in limited or unexpected results. Policymakers have many tools to influence behaviour, including regulations, such as bans, rules, and industry-wide standards; economic incentives, such as taxes, subsidies, and other price changes; and education and information, such as environmental labels on products, and outreach and marketing campaigns. While all these tools are essential for changing consumption patterns, a deep understanding of consumers' behaviour is also crucial. Policy efforts do not always result in the expected outcome. For instance, raising the price of energy to curb demand is not always effective[12].

Many policy levers rely on the premise that consumers rationally weigh the costs and benefits of all available options and make decisions appropriately. But as research in the behavioural, psychological, and social sciences show (and as is described in more detail later in this paper), consumers' decisions and actions are often counterintuitive. For example, people are susceptible to **present bias**, which causes individuals to overweight immediate costs and benefits, contributing to outcomes like procrastination and inefficient use of resources, and ultimately in some cases market and policy failures[4],[13].

Furthermore, the costs associated with incentive programmes and campaigns can make them prohibitively expensive. In fact, the use of economic incentives can occasionally backfire and cause the opposite of an intended behaviour[4]. Policymakers also face significant political challenges when seeking to restrict or ban certain goods with high environmental impact, remove household subsidies or charge for natural resources that are essential to human life[5].

Neoclassical Economic Theory and Policy Challenges

According to neoclassical economic assumptions and the rational choice theory framework, individuals behave rationally. Their decisions are guided by principles of utility maximization, i.e. maximizing personal subjective benefits. Models based on this theory have proven useful for substantiating various economic theories. However, rational choice theory falls short in explaining why people do not always act in their own interests with adverse behaviours such as overeating, smoking, or mounting consumer credit debt. When policy is designed for the "rational" person, these types of ineffective outcomes can occur[13].

[4] This is particularly true in the context of actions for the public good (like many sustainable behaviours). For example, individuals often choose to volunteer, recycle, or donate blood (all public goods) in order to show others their moral value[95]. However, financial incentives can "crowd out" motivation by weakening the way in which an individual demonstrates their moral value when making a voluntary contribution. These incentives make it less clear whether a person is undertaking a social activity to "do good" for others, or to "do well" for themselves.

[5] See, for example, recent protests on water charges in Ireland[96].

BEHAVIOURAL SCIENCE OFFERS PRACTICAL INSIGHTS TO IMPROVE POLICY DESIGN

Behavioural science draws on major advances in the study of decision-making to better understand the complexities of individual behaviour. Applying findings from this field to public policy and programme design offers new and potentially powerful opportunities to influence consumer choice and increase impact. Behavioural science can help design more effectively for the otherwise unexpected and seemingly unpredictable actions of people. Furthermore, behavioural interventions are often cost-effective and/or easily integrated into existing policies and programmes, once the effort to understand and design for the context has occurred. In terms of achieving sustainable consumption, behavioural interventions may encourage more efficient use of vital resources like energy and water, and aim to shift consumers towards choices that have reduced impact on the environment.

The objective of this paper is to summarize key insights from behavioural science to shed light on opportunities to strengthen policies for sustainable consumption in both developing and developed countries. This paper introduces the field of behavioural science, discusses five key insights that help explain the challenges and opportunities in shifting human consumption patterns, and describes several effective examples of how behaviourally informed policy has been used to further objectives for sustainable consumption across the world.

SECTION 2 The Value of Applying Behavioural Science to Sustainable Consumption

WHAT IS BEHAVIOURAL SCIENCE?

Behavioural science uses insights from psychology, **behavioural economics**, and other social sciences to deepen our understanding of human behaviour. People often assume that humans make rational decisions and take actions by consciously weighing the costs and benefits of various options available to them. Indeed, traditional economics–and most public policies–are built on this rational actor model.

However, findings from behavioural studies reveal that the decision-making process is often very different from this model.[6] In fact, people tend to use unconscious mental shortcuts and cues to quickly evaluate choices and make decisions. As consumers they may choose packaged food based on the "healthy" earthy-brown colour of the box; or decide water that looks "clean" is safe, despite knowing that contamination may be invisible to the eye. These mental shortcuts help us navigate our complex and busy world, but they can sometimes result in outcomes that are not in our own best interest–including outcomes that are unhealthy or unsustainable.

[6] For a comprehensive overview of the foundations of behavioural science and behavioural economics discussed in this section, see *Thinking Fast and Slow*, by Daniel Kahneman.

The Intention-Action Gap

By broadening the understanding of how people process information and how context affects behaviour, policymakers can design more robust and cost-effective interventions to encourage sustainable consumption choices and actions.

People are also greatly affected by mental, social, and physical context and situation.[7] This means that minor aspects of their surroundings can have unexpectedly large effects on the outcomes of their decision-making. For example, a recent OECD study found that consumers were more willing to purchase sustainable or organic meat products when they thought that others were also doing so[14].

As a result of these tendencies, sometimes it can be hard to follow through on plans and objectives. This issue is one of the most studied topics in behavioural science today and is known as the **intention-action gap**. This concept applies to many behaviours and domains, and is particularly insightful because it demonstrates a distinct difference between good intentions and actual actions. This concept can be seen with individuals deciding to save more money (but falling short), intending to exercise daily (but sitting at home instead), or in the context of sustainable consumption, meaning to buy the more 'sustainable product' (but choosing the same brand they did last time), recycle (but giving up or forgetting), or intending to conserve water or energy (but falling back into old habits). In a recent survey of European consumers, 72% of consumers said that they were willing to buy green products—but only 17% actually do[7]. In each of these cases, despite intentions and values, *something else* is getting in the way.

This is an important concept for policymaking—a public awareness programme and enabling infrastructure may create the required knowledge and intention in an individual, but nonetheless she or he may still fail to follow through

[7] For a deeper understanding of how context affects decision-making, see *The Person and the Situation*, by Lee Ross.

The Importance of Understanding Context

A crucial aspect of successful design and application of behaviourally informed policy is a close understanding of **contextual features** and the way they may impact consumer behaviour. Context varies in important ways across communities, cultures, and continents, and situational factors have large effects on human behaviour. While many of the specific behavioural science insights that will be discussed in this paper have been shown to apply broadly and in both developed and developing countries (for instance, capacity limits on information processing are a universal cognitive function of the human brain[18]), behavioural scientists in the field have begun to take cues from the more established anthropological fields and expand peer-reviewed research to a broader set of cultures. For example, Joseph Heinrich and his co-authors[19] found various significant effects of how culture affects the way people perceive fairness, approach situations of cooperation, think about morality, and think about **identity** (how they view themselves).

An example of a programme designed with a strong understanding of behaviour and cultural context is the Lucky Iron Fish™, which addresses iron deficiency in Cambodia (affecting about half of the population). Iron supplements and/or the use of cast iron pots can easily treat this deficiency, but due to the expensiveness of pills and local women's preference for lighter, more affordable aluminium pots, researchers decided on the use of an iron ingot placed into a cookpot, which leaches bioavailable iron into food. This method is not only affordable, but also easily adapted into cooking routines. To encourage use of the iron ingot, researchers developed a lightweight, easy to clean, attractive—and intriguing—design. They settled on the small fish shape—chosen by Cambodian women, who are principally responsible for daily cooking—that is considered good luck in Cambodia[20]. To date, the Lucky Iron Fish team has reached over 10,000 families[21].

as expected.[8] But by broadening the understanding of how people process information and how context affects behaviour, policymakers can design more robust and cost-effective interventions to encourage sustainable consumption choices and actions.

HOW IS BEHAVIOURAL SCIENCE BEING USED TODAY?

Globally, many leading organisations have begun to adopt a behaviourally informed approach to policymaking. In 2015, the World Bank released their annual World Development Report "Mind, Society, and Behaviour," which focused on the intersection of human behaviour and international development with multiple recommendations on the application of behavioural insights to areas such as poverty, health, and climate change[15]. An increasing number of governments across the world are incorporating behavioural science into their policymaking; the United Kingdom and United States were early adopters, but this approach has been expanding rapidly to include Australia, Canada, Colombia, Denmark, Germany, Israel, Netherlands, New Zealand, Norway, Singapore, South Africa, Turkey and the European Union[6].

However, as reflected in the examples and case studies presented here, this approach has been disproportionally focused on developed countries. It is also the objective of this publication to propose closing this gap and highlight the many opportunities to apply behaviourally informed policy to sustainable consumption goals across all countries.

The table below describes a selected set of policy initiatives to incorporate behavioural science.

[8] For an overview of the many ways behavioural science might be applied to policy, see *Nudge*, by Richard Thaler and Cass Sunstein.

COUNTRY	BEHAVIOURAL SCIENCE POLICY INITIATIVES
United Kingdom	The UK was the first country to create a central high-level policy unit in 2010 to incorporate behavioural insights into policymaking. The Behavioural Insights Team (BIT) was originally set up to improve public services based on behavioural science principles. BIT also works with other countries to achieve effective public policy design.
Denmark	The Danish Nudging Network, founded by behavioural scientist Pelle Guldborg Hansen in 2010, partners with governments and companies to design and test interventions through the application of behavioural science theories.
Australia	Australia's New South Wales Government, in partnership with UK's Behavioural Insights Team, created a Behavioural Insights Unit housed under the Department of Premier and Cabinet in 2012. The unit incorporates insights from behavioural science literature to effectively deliver government services.
United States	The White House Social and Behavioral Sciences Team (SBST) was established in 2014. SBST uses insights from social and behavioural science to improve the U.S.'s federal policies and programmes. City governments, such as New York City, are also beginning to incorporate specialized behavioural policy teams to develop and implement initiatives.
Singapore	The Behavioural Insights and Design Unit was established by Singapore's Ministry of Manpower in 2014 to improve the government's policies and programmes as well as better understand how individuals behave with regard to these government services.
Canada	The government of Ontario created a Behavioural Insights Unit (BIU) in 2015, which launched the Centre of Excellence for Evidence-Based Decision Making Support that aims to use behavioural science research to improve services offered by government agencies, and design and test interventions that are cost-effective and yield better outcomes.

Behavioural Science in Government: Improving Outcomes at an Unemployment Centre (UK Behavioural Insights Team)

The UK Behavioural Insights Team used behavioural science to improve outcomes at an unemployment centre. In an initial trial, jobseekers wrote down how they planned to complete specific job-seeking tasks over the following two weeks. Having jobseekers make a specific plan and commit to it in writing in front of an advisor resulted in the number of people collecting unemployment decreasing by 15-20% [16].

Similarly, studies show that asking people to make a plan increases the impact of a traditional get-out-the-vote script (which typically asks people to participate in the election and reminds them that voting is important)[17]. **Plan-making** can support sustainable consumption, too—see the case studies in Section IV, in particular the study on water consumption in Costa Rica (page 22).

Applications of behavioural science can be used to strengthen existing public policies and programmes across many areas. For example, the United Kingdom has used behavioural science to improve the outcomes of unemployment centres (see the box at left), tax and fine payments, electoral participation, organ donation, and charitable giving, among others. In terms of achieving sustainable consumption, this can mean enhancing the effectiveness of environmental, social, or economic legislation and policy-based incentives, as well as increasing the impact of education and informational programmes to change the way individual choices affect the environment.

To make the best use of these opportunities, policymakers and other programme designers should follow an approach that includes careful examination of context as well as testing to evaluate the effectiveness of the programme design. Ideal evidence-based testing requires a *randomized controlled trial* – an experiment where participants are randomly assigned to a group that receives the intervention (the "treatment group") and a group that receives no change (the "control group"). This type of evaluation is the closest to a counterfactual (what would happen in the absence of this programme or policy) that programme designers and policymakers can achieve. What works in one place, for one population, may not work in another. Testing helps make sure future interventions, programmes, and policies are as impactful as possible. Support

from behavioural science experts and evaluation professionals can be useful to ensure high quality research and experimental design and evaluation.

WHAT DOES THIS MEAN FOR SUSTAINABLE CONSUMPTION?

Understanding human behaviour is crucial to achieving sustainable consumption: How do people decide which product to purchase? How do they decide how to use vital resources like energy and water? How do they make decisions about reuse and recycling? Do they follow through or do they change their mind at the last minute? The answers to these questions are complex, as they are affected by many factors. Availability, access, price, and quality of sustainable options are critical; but other, less visible factors, such as peer behaviour and cultural context, are equally important.

Behavioural science tells us that people often do have good intentions to choose the right option; instead, there may be something in their surroundings, or a feature of the choice itself, that is preventing these intentions from becoming real actions.

This is where behavioural science can help us better understand the deeper complexities of consumption decisions when a sustainable option exists. For some people, the challenge is to create a stronger understanding of the need to shift behaviour. But there are many people who *already* recognize the importance of sustainable consumption, have access to sustainable options, and yet still do not change their behaviours. For example, even when consumer surveys report high rates of concern for issues related to sustainability and consumption, these expressed values do not always translate into action[22],[23].

For instance, imagine a person who leaves the lights on at home while they are away at work. The first, traditional conclusion may be simply that this individual does not want to save energy. To solve this problem, policymakers may try to convince them to change their behaviour through billboards or advertisements promoting energy conservation, or even by enacting a tax on their energy usage. However, the behavioural approach suggests that there may be other factors (and thus, solutions); is there a feature of this person's physical context or situation that might *get in the way* of an intention to conserve? For example, were they late for work? Are they having trouble programming the sensor-based lights that are supposed to turn off when there is no one home? Or maybe they are vigilant recyclers (or they installed energy efficient lightbulbs) — and so they feel like they already have done enough for the environment. Targeting each of these barriers requires a different approach than the original assumption that this individual simply did not care about saving energy.

Behavioural science tells us that people often do have good intentions to choose the right option; instead, there may be something in their surroundings, or a feature of the choice itself, that is preventing these intentions from becoming real

actions. The next section describes five of these behavioural barriers in more detail, explaining how tendencies of the human mind can push individuals to unintended outcomes in sustainable consumption. Designing for these tendencies can lead to cost-effective and practical solutions; several examples of such solutions are described in the fourth section of this publication.

SECTION 3 Behavioural Science Insights on Sustainable Consumption

This section describes five insights from behavioural science that illustrate the importance of understanding the behavioural aspects of consumption patterns. By designing programmes to better align with these common mental shortcuts and tendencies, policymakers can achieve more effective outcomes.

The insights described here are relevant to sustainable consumption as a whole. This discussion is intended to be an introduction for policymakers and sustainability practitioners on how key behavioural science principles can help explain challenges in sustainable consumption. Ultimately, by understanding the science behind the common ways consumers may appear to act against their best interests, policymakers can work to develop more effective policies to promote sustainable consumption.

Five Behavioural Barriers to Sustainable Consumption

Many "choices" in consumption are often habitual behaviors.

Consequences of consumption are often hard to see.

Sustainable consumption may not seem personally relevant.

Behaviour is influenced by peers and social groups.

It can be hard to follow through on sustainable choices.

1. MANY "CHOICES" IN CONSUMPTION ARE OFTEN HABITUAL BEHAVIOURS

Glossary Terms: Active decisions, habitual behaviours, physical cues

Many people thrive on routines. And routines can be advantageous. Routines allow people to exert less energy thinking about how to make daily, repetitive decisions, allowing energy instead to be spent on other activities. Research by academics at Duke University discovered that over 40% of the actions that people take every day are not actually active decisions, but habits[24].

Habitual behaviours occur often in consumption. This can be seen in how many people approach recycling. After initially learning that certain shapes of glass tend to be recyclable, individuals no longer need to spend mental energy considering this. They instead use the shape and physical appearance of glass as quick **physical cues**, and automatically know to recycle it - without effort[25].

Changing Contextual Cues to Increase Recycling in San Jose, California, USA

Most disposal systems have both trash and recycling bins; typically the trash bins are the same size or larger than the recycling bins. The lack of or little difference between these bins can cause people to automatically discard recyclable items in trash bins and vice versa without pausing to make sure the correct items are being thrown away in the right bin.

In the City of San Jose, California, the city government replaced its 8000 employees' desk-side 5-gallon (19-L) trash bins with 3.5- quart (3.3-L) mini cans, designed specifically to discourage the discard of paper[26]. By changing the physical characteristics of this typical arrangement, the government was able to encourage further recycling.

As a result of this change, trash service decreased by 50% and recycling grew on average by 6.3% monthly in the city's two largest administrative buildings. This intervention is effective because it changes the **physical cues** of the situation. The trash bin is now much smaller than the recycling bin, resetting the acceptable balance of trash and recycling. The small trash bin also prompts people to more consciously consider their choice to add to the contents inside the trash bin, which allows them to realize many items they previously discarded are actually recyclable, altering an often-habitual behaviour[26].

Interventions to change behaviours and habits often—quite reasonably—attempt to change people's values and intentions. However, **habitual behaviours** are not usually *about* values because they no longer involve deliberate mental effort or consideration[27]. This is true even when consequences are personally significant. For example, despite widespread knowledge of the health impacts of negative behaviours such as overeating, excessive alcohol consumption, and physical inactivity, 63% of deaths worldwide are nonetheless due to diseases associated with these automatic behaviours, including cancer, cardiovascular disease, diabetes, and respiratory disease[28].

Changing these behaviours requires "disrupting the environmental factors that automatically cue habit performance"[27]. **Physical cues** are particularly important. These are features of the context – whether they are a new sign, a rubbish bin, or the shape of a glass. Reminders and prompts are also effective as cues, though their value is largely dependent on their newness or novelty.[9] Within the field of sustainable consumption, this means achieving a detailed understanding of the cue for a target behaviour, in order to effectively disrupt it.

2. CONSEQUENCES OF CONSUMPTION ARE OFTEN HARD TO SEE

Glossary Terms: Lack of feedback; present bias; procrastination

For many resources, the consequences of use are often hard to see or understand. In particular, energy is often referred to as the "invisible resource," and researchers cite this issue as a contributor to overconsumption[29]. Studies have also shown that households' perceptions of their water use are often not well-matched with their actual consumption[30]. This is often because it is simply hard to understand consumption in the first place. Even if an individual receives information, will they know what that information means, in context? How impactful is a report of "kwh" if an individual does not understand what that measures?

It is not just the lack of visibility of consumption in the moment that matters; it is also the lack of visible long-term consequences that affects behaviour. For example, if an individual uses more water or energy today, there is no immediate feedback or cost. At most, they may notice an increase in the amount consumed on their bill, but these impacts can occur weeks after the behaviour has taken place (and this assumes that individuals pay attention to

[9] Charles Duhigg echoes these statements in his book *The Power of Habit* (2012). He states that habits are typically comprised of a "cue, routine, and reward." Changing the habit requires replacing the routine or altering the cue, but still receiving a similar reward.

Making Long-Term Savings Salient to Kenyan and U.S. Consumers: Switching to Energy Efficient Light Bulbs

The way information is disclosed can influence our decision-making, particularly when it is not easy to directly compare aspects of two products. For example, many energy-efficient products are more expensive upfront than traditional alternatives, but the overall lifetime costs are lower. Consumers considering these products often overvalue short-term costs or have trouble understanding the long-term benefits. As a result, they may purchase the less-efficient option.

Researchers conducted an experiment in the Kibera settlement of Nairobi, Kenya. Residents were either offered a subsidy on energy efficient light bulbs, provided specific information on the durability of the bulbs in comparison to traditional alternatives, or given both the subsidy and the information on durability. While the subsidy increased energy efficient purchases by 23%, combining the subsidy with the information highlighting long-term durability increased purchases by 84%[31].

In another experiment in the U.S., this same issue was addressed by targeting study participants (consumers) in multiple home improvement stores – at the point of sale[32]. The participants in the TESS lab experiment were deciding between incandescent or compact fluorescent light bulbs (at that time, the most common energy efficient option). The informational intervention clearly described the combined upfront and future costs of each bulb type. Providing simple lifetime energy costs right at the point of sale increased purchases of the more efficient option by 12%[32].

Results like these show that translating complex information (savings and costs of traditional light bulbs versus more efficient options) and presenting it in a timely manner (the moment before their purchase in a store) can reduce consumers' bias towards present costs.

their bills). Further exacerbating this issue is the fact that individuals tend to disproportionately focus on immediate costs and benefits and excessively discount future impacts, a phenomenon known as **present bias**.

The invisible and far-off impacts of many of our daily actions can make it easy to justify that *this one time* won't matter. This is even more likely if individuals know that they will have other opportunities to do the right thing later (that is, individuals procrastinate by pushing "good" behaviour into the future), or if the task is difficult: "I can't recycle this time because the bin is in the other room; but next time I'll walk over there." These continued exceptions add up, causing real impact over time.

3. SUSTAINABLE CONSUMPTION MAY NOT SEEM PERSONALLY RELEVANT

Glossary Terms: Cognitive dissonance; motivated reasoning; construal-level problems

Academic research has shown that individuals across the world are generally concerned about the environment[33]. However, these good intentions do not always translate into pro-environmental behaviours. Behavioural phenomena can help explain this disconnect. When an individual holds two conflicting ideas in their mind at the same time, they experience **cognitive dissonance**, and tend to reason away from one of the conflicting beliefs, often using **motivated reasoning** to bring them to the conclusion they were hoping for.

In the context of consumption behaviour, these principles help to explain how an individual can broadly understand the existence and implications of a problem (such as climate change), while simultaneously fail to accept that their actions are significant or that they will personally be impacted. Studies show that individuals may think that climate change "is happening and is important," but that it "will not affect me directly," citing that they have never seen any direct impacts of climate change to themselves or their friends and family[34],[35].

A second common disconnect stems from **construal-level problems**. Abstract ideas often feel physically distant, which makes these concerns seem less personally relevant[22]. For example, in a 2007 survey, a representative sample of individuals in the United States were asked how serious they thought climate change was for specific groups of people. Forty per cent of respondents thought climate change was a threat for "people in other countries," and

Emphasizing the Personal Impact of Energy Use in California

The impacts of personal energy use often seem distant and even irrelevant to consumers. Experimenting with novel ways of presenting the effects of energy use, researchers evaluated how disclosing the health impacts (including pollution, childhood asthma, and cancer) of electricity production affected energy consumption in households in the US state of California. This approach translates the consequences of energy use, typically expressed in financial or environmental terms, into personal impact.

Households were provided with real-time tailored information about their home electricity use that either communicated cost savings information or the health impacts associated with electricity consumption. The group receiving the health messages reduced energy consumption by 8%, compared to those that received monetary savings information. This information was dramatically more effective with parents, who reduced their consumption by 19%[36].

This research demonstrates the influence of emphasizing the personal impact of distant consequences — and demonstrates that the more personal the impact (customers with children, in this case), the more likely an individual will be to respond.

30% for "people elsewhere in the United States." But significantly fewer participants perceived climate change as a "very serious threat" impacting them locally; only 19% considered it a "very serious threat" for "you and your family," and 18% for "your community". Respondents saw climate change as something that affected *other* people in *other* places[37]. Academic research has shown that using **personalized information** and **feedback** can successfully address this issue. The more personal and customized the material, the more likely an individual will respond to and identify with the respective information.

Brazil's Akatu Institute created a Conscious Consumption Test (CCT) to assess the behaviours and values of Brazilian consumers. The tool indicates the key challenges to changing consumers' behaviours, addresses the issues that lead consumers to feel powerless, and investigates themes (food, water, etc.) and dimensions (house, work, etc.) of consumption that need to be addressed to change these perceptions. Between 2003 and 2012, the application of CCT showed that 5% of the Brazilian population were "conscious consumers" and 22% were "engaged consumers", the two top levels of consciousness likely to trigger the consumption choices needed to bring long term and collective positive benefits.

Akatu uses educational and communication tools to raise awareness among consumers, in both a rational and emotional way, applying the CCT before and after the interventions. This allows Akatu to more effectively evaluate changes in consumer perceptions regarding the impacts of their consumption behaviours and their transformative power. A key message is the importance of leading by example and proactively mobilizing others to do so. If, in addition, consumers receive support of a significant group in society, changes in behaviour will be maintained overtime as new social norms.

For example, campaigns on water use showed that by closing the faucet when brushing one's teeth during a lifetime (an average of 72 years in Brazil), enough water would be saved to nearly fill three fourths of an Olympic size swimming pool, and 1 million people, during one month, would save 12 minutes of the water that falls from the Iguaçu Falls. These messages were replicated in schools, companies and social networks, together with many efforts by other organizations to mobilize water savings. These contributed to a reduction of water consumption in São Paulo by more than 30%.

4. BEHAVIOUR IS INFLUENCED BY PEERS AND SOCIAL GROUPS

Glossary Terms: Overconfidence; social norms; peer pressure; identity

The consumption behaviour of individuals is often significantly influenced by the consumption patterns of their peers. This influence is stronger in moments of uncertainty, when people tend to look to the behaviour of their peers for an understanding of what is right. Social cues can provide benchmarks to place consumption into context. Sometimes these cues are misperceived; as a result, revealing how peers are actually acting can be used to correct for some biases, such as **overconfidence**.

In one study demonstrating the power of **social norms**, researchers left promotional flyers on the windshields of cars in a parking lot[38]. They found that the number of individuals tossing the flyers to the ground (instead of in the rubbish bin) more than doubled, from 14% to 32%, when there was already a noticeable amount of litter on the ground of the parking garage.

If surveyed, it is likely that many of those who littered in this experiment would state that they are against leaving trash on the ground. But in certain contexts—in this case, seeing that many others had clearly littered before them—individuals may take their behaviour cues from other sources and override their beliefs. Effects like these highlight how unreliable individual values and intentions are when predicting outcomes.

This example also demonstrates how difficult it can be to actively go against the perceived **social norm**. Refusing plastic bags in the absence of a plastic bag tax; taking the bus to work in a community where owning a car is considered a key signifier of success; cooking less meat at family meals; prominently displaying solar panels on a home where this is not the norm—all of these example scenarios may cause an individual to abandon noble intentions in order to avoid feeling embarrassed or isolated. Yet research has found that people often in fact *misperceive* the actual social norm (often because the norm itself is not clear), and thus simply correcting this misperception by showing the real norm can be effective.

Another key social influence is **identity**. **Identity**—how individuals view themselves—is not static. It can be affected by context, including who is in an individual's peer group, where the individual is physically located, and what is happening in the individual's surroundings. Further, the way in which individuals view themselves can affect

Invoking Social Norms in the form of Social Rewards to Promote Energy Conservation at a Dutch Company

Interventions that target workplaces can provide meaningful contribution towards energy conservation efforts. A 13-week study at a Dutch firm examined the effect of financial and social rewards (that were made either private or public) on employee energy usage. In the treatment group, participants were either given money (0-5 Euros) or a grade (from 5 to 10) and descriptive comment (i.e., "unfortunate..." for 5 and "great!" for 9 or 10), based on their energy conserved weekly. The rewards they received were either private (known only to them) or public (known to the entire group). The control group received no rewards or feedback.

Social rewards led to greater energy conservation than monetary rewards, and public feedback led to greater energy conservation than private feedback. Making the rewards public both provides feedback on consumption and creates social norms among participants. Receiving both a social reward and public feedback overall conserved energy by 6.4%; effects persisted at least eight weeks after the intervention [39].

their reception to messages from others. For instance, professionals leading a public health programme in Zimbabwe, Africa hoped to increase condom use to reduce the transmission of sexually transmitted diseases. During initial trials, the researchers had witnessed resistance to information when advice was provided directly from the researchers themselves. As an alternative, the researchers recruited local hairdressers to deliver their message instead, which led to a dramatic increase in the uptake of condom use[40]. This example from the public health sector demonstrates the power of careful consideration of **identity** and other social norms.

5. IT CAN BE HARD TO FOLLOW THROUGH ON SUSTAINABLE CHOICES

Glossary Terms: Choice architecture; defaults; hassle factors

Sometimes the way in which options are presented or arranged to the consumer—the **choice architecture**—actually steers consumers towards the non-sustainable option (purposefully or not). For example, energy consumers are often automatically assigned to conventional, rather than renewable, energy suppliers, and must opt-in to other supplier options. A German study, however, found that despite the higher costs associated with renewable energy, consumers who were not automatically assigned, but instead asked to choose between conventional and renewable suppliers, chose the renewable option 68% of the time. This rate dropped to 41% when the conventional supplier was presented as the **default** option (the rate was the same, 68%, when the renewable supplier was presented as the **default**)[41].

This example highlights the potential benefits of making the **default** the sustainable option. The U.S. Department of Energy evaluated the enrolment rates of time-based rates programmes—which encourage smarter energy use—that provided opt-in or opt-out options. Opt-out options that made the time-based rates the **default** had a recruitment rate of 84% compared to the 11% rate of opt-in options[42]. Similar effects can be seen with other ways of structuring choices, including forced choices (when an individual has to make a choice before proceeding—usually a simple "yes" or "no") and prompted choices (when an individual is specifically prompted or re-prompted to make a choice).

Studies have shown that common (yet minor) requirements like paperwork can have significant negative impacts on outcomes.

Furthermore, even when individuals do clearly prefer the sustainable option, small tasks can prove to be disproportionate barriers to follow-through. Studies have shown that common (yet minor) requirements like paperwork can have significant negative impacts on

Making it easier to throw waste in garbage cans in Copenhagen, Denmark

The Green Footprints experiment in Copenhagen, Denmark demonstrates the effect of minimizing the hassle of searching for trash bins. Pedestrians were handed free caramel candy and the number of wrappers on the street, side streets, bicycle baskets, and the street's garbage cans were counted afterwards. Then green footprints leading to garbage cans were placed on the ground. Free caramel candy was handed out again and the amount of wrappers was again counted. The green footprints reduced litter by 46%[43]. In addition to reducing hassle, the green footprints may also be novel enough to act as **physical cues** to interrupt **habitual behaviour** that may have resulted in littering. Based on the results from the experiment, this approach to curb littering was subsequently implemented in the city of Copenhagen[44].

outcomes.[10] These small, yet important snags are called "**hassle factors**." Whether they are real ("programming a thermostat is hard") or just perceived ("programming a thermostat *seems* hard") they can prevent actions from happening, even when the benefits are large or intentions are good.

Within efforts to encourage sustainable consumption, **hassle factors** for consumers can include tasks such as understanding public transportation schedules, making calculations to understand fuel costs, and properly sorting and disposing of waste. Researchers have found success with reducing these hassles by translating complex information into easy-to-digest pieces and making actions as intuitive and easy to complete as possible[45].

[10] For example, the application for federal student aid in the United States is eight pages long. Clearly, the future benefit of a college or university education far exceeds the annoyance of filling out even a somewhat tedious form; but one 2008 experiment showed that helping low- to moderate-income families fill out the application not only made them more likely to submit the form, but also made them more likely to enrol in college in the fall[97].

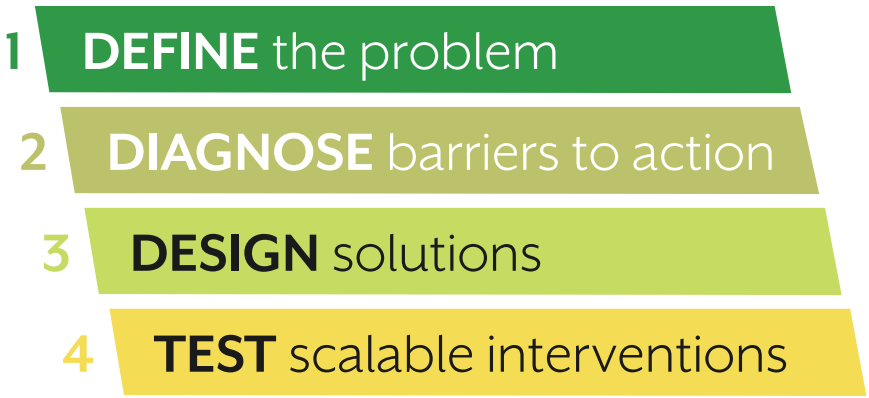
SECTION 4 Applying Behavioural Science to Key Sustainable Consumption Areas:

Examples of Application from around the World

This section presents examples of successful applications of behavioural design to priority consumption areas: Energy, Water, Transportation and Mobility, Food and Diet, and Waste and Disposal.

There are many more opportunities to apply behaviourally informed strategies to sustainable consumption than are described here. For example, while policymakers and behavioural science experts have designed and tested many interventions targeting home energy use, less work has been done to encourage consumers to, say, reuse or repair consumer goods instead of frequently replacing them. These examples should serve to inspire policymakers to seek other opportunities to apply behavioural science to sustainable consumption.

As emphasized earlier, it is important to carefully consider the situation in which a problem exists. Applying insights from behavioural science should be done systematically and scientifically; Datta and Mullainathan[46] describe one such approach that breaks the process down into four phases:

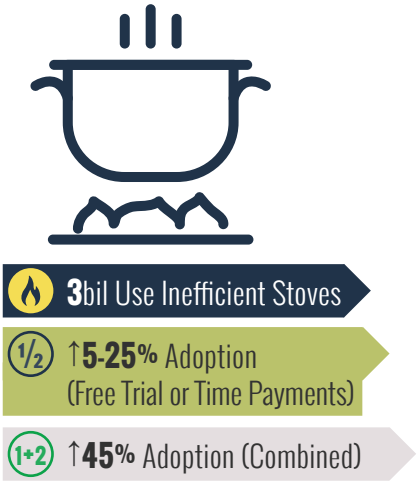


In order to solve a problem, one must have an adequate understanding of the uniqueness of a given context—the design of a form or a label, or the social surroundings, or the time of day—and how these contexts may affect behaviour. Researchers and policymakers must always question early assumptions to understand what the key issues at-hand truly are; use interviews, observations, and literature to understand how individuals make decisions and take action. This knowledge can then be used to design interventions to solve key issues. By then testing these interventions, policymakers and researchers can rigorously evaluate the effectiveness of their approach.

ENERGY

Energy is essential to development. Energy demand is set to grow by at least one-third by 2040, primarily from developing countries, according to the International Energy Agency (IEA) projections[47]. Keeping the increase in global average temperature below 2°C above pre-industrial levels, with the objective of limiting the increase to 1.5°C (the universal target set in the 2015 Paris Agreement[48]) will require more stringent adoption of energy efficiency measures and less carbon-intensive energy sources[47].

Globally, households account for 29% of energy consumption and contribute to 21% of carbon emissions[49]. Researchers estimate that adopting interventions based on behavioural strategies could reduce individual energy consumption by 5-20%[50]. Adopting such measures presents a significant opportunity for policymakers to affect energy consumption. Three strategies that incorporate the principles of behavioural science to influence household energy consumption are described below.



CASE STUDY

Using Unique Sales Offers to Increase the Uptake of Efficient Cookstoves in Uganda

Approximately three billion people use inefficient stoves[51], which burn biomass such as wood and charcoal, for cooking and heating. Smoke emitted from these stoves causes household air pollution, which has been linked to millions of deaths from related diseases, especially among the women and children exposed to this type of cooking. In addition, the biomass used in these stoves contributes to deforestation, local ecosystem decline, and climate change. Finally, it is also very expensive to buy or gather this type of cooking fuel—especially among low-income populations. Despite the inefficiency and high costs associated with these stoves, the adoption rates of improved cookstoves—producing less smoke and significantly reducing fuel costs in the long run—is relatively low, particularly in developing countries, where inefficient stoves are widely used[51].

Researchers from the University of California Berkeley identified three potential barriers limiting uptake of improved cookstoves in Kampala, Uganda[52]:

- Personal liquidity constraints and **present bias**: Many consumers may not be able to pay for the improved cookstoves (characterized by higher up-front costs compared to traditional inefficient stoves) in one payment; in addition, such upfront costs may deter them from focusing on the future benefits of this investment.
- Savings concerns: Consumers are wary of salespeople and do not believe the improved cookstoves' advertised fuel savings.
- Durability concerns: Consumers question the durability of the cookstoves.

In order to combat these barriers, consumers were offered one of three options: a free trial that required them to pay only after the trial ended; the ability to pay in installments over time, with the option to return the stove and stop payments at any point; or a combination of both of these offers. The free trial allowed consumers to see the benefits of using an efficient cookstove and test durability and fuel savings, with no financial costs upfront—addressing **present bias**. Arrangements allowing payments for the stove over a period of time addressed the consumer's inability to pay the full purchase price of the cookstove upfront (and also helped mitigate risk, since the consumer was allowed to return the stove at any time).

In the experiment, sales teams went to homes in different neighbourhoods and offered one of the three sales offers or the option to pay the full price of the cookstove right away or in a week (traditional offer). Households also filled out surveys that served as indicators for each barrier the study sought to overcome. Researchers found that offering the free trial or time payments increased the adoption rate of improved cookstoves by 5% to 25%, compared to 4% uptake with the traditional offer, while the combined sales offer increased uptake up to 45%[52]. This suggests that the barriers identified by the researchers were indeed hindering uptake.

It is important to note that there are varying results in experiments conducted on cookstove adoption, as well as questions about its efficacy and sustained long-term impact in reducing air pollution and improving the health conditions of individuals who adopt the technology. For example, different researchers conducted a four-year experiment that followed the adoption of cookstoves in India[53]. They found that while households initially used the technology, which subsequently reduced smoke inhalation, over time these effects disappeared. There was no significant decrease in air pollution or improved health outcomes for those using the new stoves, nor was there evidence that the new cookstoves reduced emissions, fuel use, or fuel costs. These results and the arguments around the efficacy of cookstoves show the importance of evaluating how individuals behave in respect to the adoption and use of new technology. There are substantial barriers, both technical and behavioural, to the uptake and sustained use of cookstoves (e.g., ease, maintenance, and cost to use) and only by addressing those barriers can significant uptake be achieved.

CASE STUDY

Leveraging Social Norms and Personalised Feedback to Decrease Worldwide Energy Consumption

Opower is a software company that partners with electric utilities to re-design the way electricity use is displayed to consumers. Opower mails Home Energy Reports to households, which include personalized energy feedback, comparisons between a household's energy use and that of similar neighbours—which leverage the power of social norms—and personalized energy conservation tips featured as "Action Steps"[54]. For example, these steps may recommend households to programme their thermostat or seal air leaks as a way to conserve energy. The "Action Steps" create a **channel factor** for people to act, by reducing the hassle of having to figure out how to reduce energy use[55].

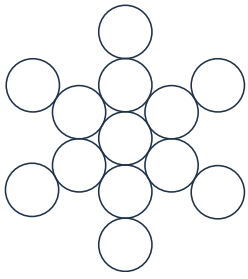
Allcott and Rogers[54] examined three Opower programmes that mailed Home Energy Reports to a total of 234,000 households

every month or every few months. After two years, part of the treatment group in these programmes was randomly assigned to stop receiving the letters. This allowed the analysis of the intervention's long-term effects through the comparison of participants that continued to receive the letter and those that did not.

After the initial mailed letters, households immediately decreased their energy consumption, but their conservation patterns gradually declined. However, as the intervention continued, households' reduction of energy usage persisted. For those whose letters were discontinued after two years, the treatment effects diminished at only 10-20% per year. Furthermore, households who continued to receive treatment after two years still continued to show reduction effects in their energy consumption, thus showing the long-term effects of the intervention[54].

As of June 2016, Opower has helped utility partners save over 11 terawatt-hours (TWh), the equivalent of more than $1.1 billion in consumer savings and an abatement of more than 12 billion pounds of carbon emissions[57]. On average, Opower's letters have led to a 2% reduction in energy use[56]. Achieving comparable reductions through price increases would require raising energy prices by 11-20%[56]. This shows the importance of studying consumption patterns and leveraging social norms to motivate changes in consumption behaviour. It also shows how small changes in many individuals' actions can lead to big impacts on sustainability.

Similar studies have been done in other areas, though they tend to be in developed countries. However, a recent study on urban middle-class households in India found that providing peer comparisons led to reductions in energy consumption[58]. From a policymaker's perspective, this case study shows how important it is to encourage the business sector to invest and innovate more efficient use of natural resources.



Low Uptake of Smart Grid Technology

2.5x Likely to Choose Default

CASE STUDY

Framing Smart Grid Technology to Increase its Adoption Rate among Consumers in Denmark, Norway, and Switzerland

Home electricity consumption in Europe has increased by 40% between 1990 and 2010[59]. While the demand for energy continues to rise, innovations have been developed to shift energy use toward more sustainable practices. One such innovation is Smart Grid technology, which relays information between utilities and consumers and gives utilities the ability to remotely reduce energy consumption during peak periods. Despite the significant potential for both providers and consumers of electricity, uptake of Smart Grid technology has been low.

One commonly cited barrier to uptake is the in-home installation process. Trying to further their understanding of this barrier, researchers examined how framing techniques could affect the way consumers made decisions about the installation of Smart Grid technology. Researchers conducted two experiments to test how different framings affected uptake. The first was an online survey that asked participants from Denmark, Norway, and Switzerland to make a decision about allowing an electricity company to install the Smart Grid into their homes. The question was framed either asking participants to opt-in to receiving the Smart Grid, opt-out to not receive it (**default** option), or a neutral condition that required participants to make the choice of whether or not they wanted installation (**active choice**). Participants in all three countries were two and half times more likely to accept the Smart Grid installation in the opt-out condition than the opt-in condition, while the acceptance rate in the opt-out condition did not differ significantly from the neutral active choice condition.

The second experiment was a field study that examined how the opt-in, opt-out, and active choice framings affected homeowners' acceptance of the technology for remotely controlling the electricity use of their heat pump in Denmark. Results were consistent with the online study—more participants accepted the Smart Grid technology in the opt-out condition than the opt-in condition (the acceptance rate in the active choice condition was not significantly different the acceptance rate in the opt-in condition)[60].

The experiment shows that the framing of choices has a significant impact on consumer behaviour. Making the more sustainable choice the **default**, if possible, is an effective and simple way of achieving sustainability objectives, such as reducing energy use.

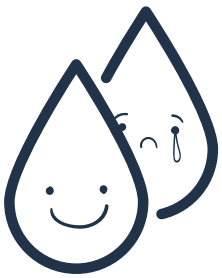
WATER

Global water use has exploded over the past century. Over 1 billion people already face water scarcity; by 2025 this number may triple[61]. This problem is exacerbated by a number of issues including population growth (particularly in urban areas), consequences of unsustainable lifestyles, and climate change[62].

There are many opportunities to influence individual and household use of water, including cooking, washing, sewage, and maintenance of lawns and gardens. Examples of the use of behavioural science in water programme design are described below.

CASE STUDY

Social Comparison and Plan-Making Tools Nudge Water Conservation in Costa Rica



↓**4.6%** Average Water Consumption

6.7mil (m^3) Potential Savings

In 2014, ideas42 partnered with the World Bank to understand attitudes toward household water use in Belén, Costa Rica (a town of about 21,000 residents). In diverse focus groups of residents, researchers heard participants frequently speak of the general importance of water conservation, as well as the influential role that households play in water resource management. Despite this, however, most residents did not have a good sense of how much water they were actually using (lack of a comparison group), nor did they have concrete plans to reduce their own consumption (**intention-action gap**). From these insights, the teams set out to encourage reductions in water consumption throughout the municipality[63].

To accomplish a reduction in water consumption, the team focused on three low-cost, letter-based interventions. Two of the interventions provided a sticker on a residence's water bill that either compared the household's water use to the average household in their local neighbourhood (neighbourhood social comparison) or their town, Belén (city social comparison). The sticker had a "smiley face" if the household's water consumption level was lower than the average household in their neighbourhood or town, or a "frowny face" if the consumption was above the average. The third intervention provided postcards along with the water bill that made consumption salient and acted as a planning prompt to help people set goals and form concrete plans to reduce their water consumption[63].

The sticker-based intervention that highlighted neighbourhood comparisons (versus town level) reduced monthly water consumption between 3.7% and 5.6%. In a different group, prompting residents via postcard to take steps to conserve

water reduced consumption between 3.4 and 5.6%. On average there was a 4.6% reduction in water usage. If all households in Belen received these interventions, about 6,720 cubic meters of water could be preserved each month. This translates to 94,080 washing machine loads, 188,000 showers, or 222,000 dishwasher loads saved - in a single month[63].

These positive results have additional significance: first, some behaviourally informed design strategies can translate across different settings and cultures. It is well-documented that the use of social comparison information is effective in changing energy consumption in developed country contexts[32] [56]. However, these interventions had not previously been shown to work in other contexts, particularly in developing countries. Second, this intervention was purposefully simple (two sets of stickers), because of resource constraints with the local government in Belén. This makes an intervention like this much more adaptable to other developing country contexts, where complicated and complex software may not be a feasible solution. Nonetheless, it is important to tailor behavioural interventions to the specific population and circumstance; as demonstrated in this case, interviews with target users can help uncover key insights from behavioural science and guide the final design.

↓10.29L (person/day) Water Use

Specific tips result in sustained behaviours

CASE STUDY

Information, Social Norms, and Feedback Interventions Reduce Water Usage in Australian Households

In 2011, researchers from the University of Queensland examined methods of encouraging water conservation with households in Southeast Queensland, Australia. As opposed to examining the effects of traditional approaches (which tend to focus on prices and bans), the researchers instead examined the effectiveness of providing water users with different types of information through postcards.

They divided households into four groups. The first group (Group 1 – Advice) was given simple tips on how to save water. The second group (Group 2 – Social Norms) received guidance on how to reduce their water usage by receiving information of what methods other similar households with low water consumption did to save water. The third group (Group 3 – Specific Use) was provided with water-saving tips along with specific information of where water was being used in their household. And the final group (Group 4 – Control) received no information.

All households were sent the information through postcards and had smart water meters installed in their homes that allowed researchers to accurately measure household water consumption.

During the study, average water consumption was reduced by 10.29 litres per person per day (the average individual from this study uses about 120 litres of water per day). While all three interventions led to a reduction in water usage, the study showed two unexpected effects. First, those in 'Group 1 – Advice' and 'Group 2 – Social Norms' showed comparatively faster declines in water use than those in 'Group 3 – Specific Use'. Second, however, when measuring outcomes over the long term, those in 'Group 3 – Specific Use' showed a much more sustained decline in water use, while Group 1 and 2 ultimately increased their water use after the intervention period[64].

This study demonstrates that it is critical to measure the effects of programmes and policies over the long-term. What appears to work in the short-term may not be effective over a longer period of time.[11]

↑**10-60%** Uptake

Reducing **hassle factors** leads to greater adoption

CASE STUDY

Reducing Hassle Factors in Water Purification Strategies in Kenya

Every day thousands of children under the age of five die from diarrheal diseases, with a majority of these deaths directly related to contaminated water, poor sanitation, and hygiene[65]. Many efforts have been made to increase access of safe drinking water. A large-scale study in Kenya examined the prevalence and effectiveness of a water purification tool (diluted chlorine solution), which could be purchased at local shops. Despite a prevalence of water-borne diseases, uptake and usage of the chlorine solution was extremely low. To encourage usage, coupons for discounted chlorine solution (a traditional economic incentive) were distributed to residents. However, this had no significant effect on uptake rates.

Researchers decided to re-examine the problem, with a closer understanding of the behavioural aspects. How did households think about getting and using water? What actually happened in that process? These questions helped the researchers to realize that households often made daily trips to a water source, and that making an extra trip to a store for the chlorine solution felt inconvenient, despite the known benefits[66]. Extensive research in behavioural science shows that even small inconveniences and perceived **hassles**—like having to make a second trip to a store, or remembering to bring a coupon—have considerable effects in delaying (sometimes indefinitely) the adoption of programmes, despite an understanding of the important, serious benefits[67].

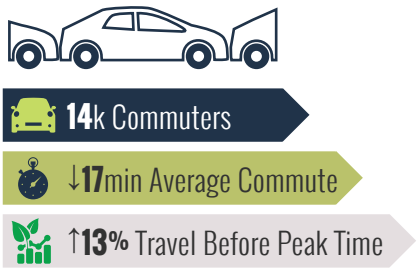
[11] Hunt Allcott and Todd Rogers[54] have documented such persistence in Opower interventions, where despite some linear decay of the effect, trends suggest that it would take 5-10 years after the intervention was discontinued for the effect to return to zero. This is much longer than most researchers and policymakers originally expected, and approximately doubles the cost-effectiveness of the intervention.

With this deeper understanding the researchers moved the chlorine solution to large containers at the water source itself. This made the choice to use the chlorine solution easier, more visible, and also more public—everyone could see everyone else using it. The large containers were designed to dispense the exact amount of chlorine needed to purify the amount of water that fits in the standard jug most households use with one turn of a valve so that they don't have to worry or think about using the right amount[68]. In addition, this arrangement was more cost-effective in terms of delivery and marketing. Uptake rates rose from about 10% to 60% in communities with the source-based chlorine solution[66]. The experiment highlights the importance of making processes simpler and hassle-free in order to remove possible barriers to sustainable actions.

TRANSPORTATION & MOBILITY

Transportation is a major source of energy consumption. Use of motorized forms of transport like automobiles increases pollution, consumes natural resources, and contributes to carbon emissions— the transport sector contributes approximately 15% of global CO_2 emissions (10% of that is motor vehicles)[69].

There are many opportunities to encourage the use of more fuel-efficient vehicles and promote alternatives to private passenger vehicles, including public transportation, walking, and bicycling. For instance, many people use private cars for daily commutes; behavioural insights can help policymakers more effectively encourage car buyers to choose fuel-efficient vehicles, as well as develop effective strategies to change commuting routines altogether. Several examples of the use of behavioural science in transit policy design are described below.

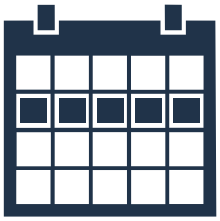


CASE STUDY

Using Lotteries to Reduce Traffic Congestion in India

Traffic congestion in Bangalore, India is a significant problem. Growth in the Information Technology and call centre industry, as well as a new airport, has led to long commutes from the main residential areas to new industrial development. Average commute times for those leaving after 7:30 AM are about 1.5-2 times longer than the average commute for those who leave before that time. Longer, congested commutes result in decreased fuel economy, leading to higher consumption of gasoline and more emissions. To address this, transportation consultant Urban Engines tested the effects of an incentive scheme called INSTANT that rewarded Infosys (a large IT company) commuters with entries into a weekly raffle. Behavioural science shows that people are consistently **overconfident** that the small probability of winning a lottery will fall in their favour (think of the high participation in lotteries and prize drawings throughout the world)[70]. This means that improbable rewards can often be used as effectively as more expensive individual incentive schemes.

Commuters were awarded raffle credits according to their arrival time, with less congested arrival times receiving more credits for higher reward amounts. The pilot project ran for six months from October 2008 – April 2009, involved approximately 14,000 commuters, and reduced the average morning peak commute time from 71 to 54 minutes—with the number of participants traveling before the peak shifting from 21% to 34%—at a total cost of about USD$50,000[71].



↓18% Car Usage

↑50% Public Transport

↓19% CO_2 Emissions

CASE STUDY

Using Travel Feedback Programmes to Encourage Sustainable Transportation Methods in Japan

Mobility management programmes have been gaining popularity in Europe, Australia, the United States, and Japan. These initiatives encourage people to use more sustainable forms of transportation through personalized communication, incentives, and/or using marketing techniques targeted at personal travel behaviour. In Japan, they are referred to as travel feedback programmes (TFPs). These programmes have been used in schools, workplaces, and residential areas. An analysis of ten TFPs found an average 19% reduction in carbon emissions, an 18% reduction in car use, and a 50% increase in public transportation[72].

TFPs vary in the specifics of techniques, but all aim to achieve shifts in travel behaviour through one or more of the following behavioural strategies: (1) by making negative impacts of travel methods more salient through information about carbon emissions or health effects; (2) by using goal-setting and/or plan-making techniques to help commuters follow through on their intentions to change travel behaviour; and (3) by providing **personalized information** (occasionally based on multi-day travel diaries) on travel planning[72]. As a typical example, one successful 2004 TFP in the city of Suzurandai provided area-specific transit information to 210 participants, and asked each individual to make a behavioural plan for how to reduce their car use, as well as specify the percentage by which they aimed to increase their usage of public transport. This programme resulted in a 19% decrease in car use, and a 31% increase in public transit[73].

Furthermore, a meta-analysis of TFPs implemented in residential areas in Japan showed a 7.3% reduction in car use, and a 68.6% increase in public transportation use. Analysing only TFPs with control groups showed a 12.1% reduction in car use and 38.6% increase of public transportation use[73].

75% Campaign Retention

↑15% Sustainable Shift

CASE STUDY

"No Ridiculous Car Trips" Campaign in Malmö, Sweden

The city of Malmö, Sweden is home to about 300,000 people. A 2003 poll revealed that half of all car trips made in the city were less than 5 kilometres. The city declared that this was "ridiculous," given the traffic congestions and expensive infrastructure supporting such short trips. In 2007, Malmö started a campaign—which continues to take place each year—called "No ridiculous car trips," which invited

residents to submit written accounts about their most nonsensical car trips for a chance to win bicycles.

In a humorous and memorable way, this campaign (led primarily by sociologists and psychologists) drew attention to the often-habitual choice to drive short distances, and implied a general public commitment to changing behavioural norms. The city also gave small gifts to cyclists, like seat covers and drying cloths, as thanks for choosing to bike; this created feelings of **reciprocity** that encourage people to continue to ride. The campaign also asked cyclists—wearing bright orange clothing— to time specific routes around to the city to prove the convenience and quickness of cycling.

A 2008 evaluation of the campaign showed that about 75% of residents remembered the campaign's main objective of using bicycles instead of cars as their mode of transportation and 15% of residents reported a sustainable shift in their behaviour due to the campaign[74]. Coupled with infrastructure improvements, Malmö has had significant results—in 2007, 12,000 residents made fewer short trips by car[75], and 30% of the population reported cycling (up from 20% in 1995)[76].

FOOD & DIET

Unsustainable food consumption contributes to environmental degradation, malnutrition, and a rise in so called "lifestyle diseases" or non-communicable diseases such as diabetes and more. About one-third of all edible food is not actually consumed, which amounts to 1.3 billion tonnes of wasted food per year[77]. However, there are opportunities to develop behaviourally informed policies and programmes that encourage consumers to choose and consume food sustainably, shift diets towards food that is locally sourced and grown with more sustainable use of pesticides and fertilizers, and discourage food waste. Examples of the use of behavioural science in food consumption policy design are described below.

↓**19.5%** Food Waste

Physical and **social cues** promote sustainable habits

CASE STUDY

Using Physical Cues and Setting a Social Norm to Decrease Food Waste in Norwegian Hotels

The organization GreeNudge designed an intervention to decrease food waste by changing elements of the physical environment in hotel restaurants in Norway[78]. The amount of food people consume can, like other behaviours, be heavily affected by aspects of the situation in which they are eating. This is partly the product of **habitual behaviour** – individuals may regularly eat a snack at their desks or eat a meal with friends, paying more attention to work or to the conversation than to the specific amount of food consumption itself. In these moments, it is frequently the physical cue of the context—in this case the size of a plate or a bowl—that may affect our consumption.

Researchers tested two interventions. In the first, typical buffet plates were replaced by smaller-sized plates. In the second, researchers hung up signs encouraging guests to visit the buffet again—"Welcome back! Again! And again! Visit our buffet many times. That's better than taking a lot at once." In the latter case, the size of the plates remained unchanged.

Changing the physical cue by decreasing plate size alone reduced food waste by 19.5%, and promoting a new norm by hanging up signs encouraging guests to make multiple visits to get food rather than loading food on a single visit reduced food waste by 20.5%. The use of **physical cues**, which are linked to **habitual behaviours** (the size of the plate is a subconscious cue for the amount of food to take), and social cues (looking to others or the environment for direction on how to act) helped to promote sustainable food consumption[78].

72% of Products had Lower Mileage

Relevant knowledge helps promote sustainable behaviour

CASE STUDY

Providing Real-Time Feedback on Food Selection to Encourage Sustainable Choices in U.S. Consumers

Research has shown that people's preferences for food are unexpectedly malleable and can be influenced by many factors[79]. The varying cost of items can have significant effects, for example, as can convenience related to access. Further, consistent purchases have the potential to become long-term habits.

However, consumers have limited attention and typically only focus on the most visible features of products. These rarely include the source or resource-intensiveness of an item. Since food production and transport information typically lacks **salience** in comparison to other factors, even well-intentioned consumers may not make the optimal choice for their preferences.[80].

Researchers conducted a small study aimed to influence shoppers' decisions in the supermarket by linking purchases to the impacts of production, specifically focusing on the distance food had to travel during production[80]. The authors fitted shopping carts with devices that used LED lights to provide this production distance information, making this information salient. Shoppers' choices were also placed into a social context – their decisions were compared to others when choosing between different brands of the same product. When food purchases were compared, 72% of the products purchased by shoppers using the LED-fitted carts had lower mean food mileages than those selected by shoppers using the regular cart[80]. While this study was small (12 participants), results were encouraging and replication with larger sample sizes should be explored.

CASE STUDY

Love Food, Hate Waste Campaign in the United Kingdom

LOVE FOOD hate waste

£**10**bil Food Waste (per year)

↓**13%** Food Waste

In the United Kingdom, more than one third of purchased food is unused and discarded. This is equivalent to 6.7 million tons of food annually, totalling a cost of £10 billion per year for households. In response to this issue, the United Kingdom's Waste Resource and Action Programme launched the "Love Food, Hate Waste" programme in 2007. This was a social campaign with behavioural components that aimed to reduce food waste by raising awareness of the consequences of waste itself, as well as educating consumers about the financial and environmental benefits that can be accomplished by changing food related behaviours, and finally by giving individuals tips on how to reduce waste.

The campaign worked in tandem with the United Kingdom grocery sector, the food industry, the Federal Government, and organizations such as the Food Standards Agency to develop consumer-facing communications for waste reduction strategies. There were several behavioural aspects of the campaign. Consumers were encouraged to make a shopping plan (i.e., examine pantries and then create a shopping list) to prevent over-purchasing and impulse buys. Also included were recipes for using leftovers (to change individual's valuation of their leftover food), and encouragement to properly portion food through a portion calculator (to prevent excess leftovers in the first place). The campaign further attempted to prevent waste by providing specific tips on how to properly store food (such as storing apples in the fridge so they last longer), and clarified what the often-confusing "use by date" means. From 2007 to 2010 there was a 13% decrease in food waste in the United Kingdom (though other factors such as rising food prices may also have contributed to this decline)[81].

WASTE & DISPOSAL

Growing populations and continued urbanization produce a significant amount of waste, which poses major public health and environmental concerns. While it is difficult to measure, a best "order of magnitude" estimate of the total amount of global municipal solid waste produced annually is 2 billion tonnes, and growing[82]. Sustainable measures around waste management promote reductions to waste generation, as well as the reuse, recycling, and proper disposal of products. Opportunities for shifting behaviour include changing how consumers dispose of goods, including food, consumables, electronics, and appliances. Several behaviourally informed strategies to decrease waste and increase recycling rates are described below.

↑6 Percentage Points More Likely to Recycle

Reducing **hassle factors** leads to greater participation

CASE STUDY

Promoting Recycling in Peru by Decreasing Hassle Factors

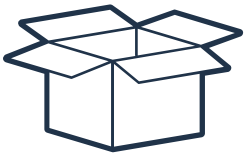
Solid waste disposal is a significant issue in Peru. To address it, many waste management programmes have been implemented in the country. PRISMA is an NGO that supports waste pickers by helping them build small recycling businesses that provide door-to-door collection. To enrol households in the programme, PRISMA marketers visit residents with the trash collectors and provide information and free recycling bags to encourage them to separate recyclables from trash. However, PRISMA faced compliance challenges once households were enrolled in the programme—specifically the high contamination of recyclable items and low frequency of recyclables turned in. To tackle these problems, PRISMA partnered with researchers to conduct an 8-week intervention.

Researchers surveyed households enrolled in the programme to understand what factors might prevent them from regularly and properly separating recyclables and having them collected. They found that bags provided to participants were actually often too small to contain all the recyclables. Participants also had to find a place in their homes to keep them until they were collected, which households did not like doing because it not only took up space, but also attracted insects.

Researchers applied these findings to test a new strategy for PRISMA. They distributed plastic recycling bins to make it easier for residents to cleanly store recyclables, and they included stickers on some of the bins to provide additional, salient information on recycling. Households were randomly assigned to receive a bin with a sticker, a recycling bin without a sticker, or no bin. By providing bins coupled with stickers, researchers hoped to not only increase the amount of

recyclables collected, but also decrease contamination and improve the quality of what households turned in to collectors.

The researchers found that households that received bins were six percentage points more likely to turn in recyclables. A greater amount of recyclables (about 0.2 kg) and fewer non-recyclable items were also collected from these families, compared to households with no bins. The addition of the sticker had *no* significant effect, suggesting that, contrary to the reasoning behind most traditional informational campaigns, more knowledge was not the answer. Rather, the associated hassles—the labour of finding storage for the recyclable refuse and the inconvenience of it taking up space in their homes—were the real barriers to compliance in the programme. By understanding and addressing this issue, PRISMA was able to increase and improve recycling among residents. If households were to stay in the programme for two years, the amount of recyclables collected through the programme and the income of collectors would surpass the relatively high initial cost of the bins[83].



↑**25.4%** Recycling (Feedback)

↑**40%** Recycling (Combined)

CASE STUDY

Using Public Commitment and Feedback Strategies to Promote Recycling in the Midwest United States

In the United States, about 251 million tons of trash were generated in 2012. Of this, about 87 million tons were composted or recycled, equivalent to a 34.5% national recycling rate[84]. Methods such as small cash incentives, free recycling bins, and reminders and brochures have been used in the States to increase recycling rates. Deleon and Fuqua[85] explored a new strategy—whether social incentives could increase recycling rates in an apartment complex in the Midwest United States. They used public commitments from individual apartments, as well as performance **feedback** interventions, dividing experiment participants into four groups.

Two of the four groups received "public commitment" letters, which were written consent forms that asked each apartment to commit to recycling, including eventually publishing their names in a local newspaper. Two of the four groups also received weekly **feedback** on the amount of recyclable paper produced by each respective household. The division of the experiment was one public commitment-only group, one feedback-only group, one combined group, and one group that received no intervention. One week prior to the first recycling pickup in the experiment, cardboard recycling bins were mailed to all participating apartments. Overall the **feedback** and combined intervention groups generated more recyclable paper, by 25.4% and 40% respectively[86].

↓15% Daily Paper Use

Sustainable **default** options reduce paper consumption

CASE STUDY

Using Defaults to Encourage Students towards More Sustainable Printing Behaviour in Sweden

Often the way choices are structured—including how obvious or how hidden an option is—can have a significant effect on outcomes. Researchers at a large Swedish university tested how the **choice architecture** of printing might affect the environmental preferences of students. They accomplished this by manipulating what the **default** printing option was on a given computer—whether documents would automatically print double-sided or single-sided (students were free to change the option, but were not prompted to do so).

After making the switch, daily paper consumption reduced by 15%[87]. The results of their experiment suggest that "roughly one third of all printing is determined by the default alternative." That is, about one third of the students were inattentive to the print setting on their computer. These results provide a key behavioural insight: the changes did *not* stem from intentions or beliefs. The increase in double-sided printing, a more pro-environmental behaviour than single-sided printing, occurred not through convincing or pleas, but by simply changing the way choices were structured, without actually forcing choices in any way. This is supported by the failure of the second intervention, which was a standard environmental plea, as well as the fact that the changes were immediate and remained intact for six months. Changing the **default**, when possible, can often be a highly effective, inexpensive intervention preventing unsustainable behaviours from the outset.

SECTION 5 Conclusion

KEY TAKEAWAYS

Resource scarcity, environmental degradation, and volatility of commodity prices are putting increasing pressure on society, business, and governments worldwide, and these trends and impacts are being further exacerbated by climate change. Water demand alone will surpass supply by 40% within 15 years[88]. There is also the prospect of three billion middle class consumers joining the global economy by 2040. Asia will support the bulk of this growth: by 2030, Asia will represent 66% of the global middle-class population and 59% of middle-class consumption[89]. If not addressed through changes in consumer and producer behaviours, these trends will place even greater pressure on the world's already stressed natural resources and ecosystems.

Sustainable Consumption and Production (SCP) seeks to change both the consumer (market demand) and producer (market supply) ends. To date, much of the effort has focused on changing production methods and policies; however, assuming that the material conditions exist to make sustainable choices, changing consumer behaviour and demand is equally important. These are two sides of the same coin.

The behaviour of individuals plays a major role in consumption trends, from daily habits to larger decisions about where, when, and how to use resources. But changing behaviour is challenging, even when favourable conditions are in place—people can be inconsistent, and actions and intentions do not always align. Integrating behavioural science into the policymaking process can ensure that policies and public governance are more effective in achieving priorities. Recognizing this, policymakers across the world are incorporating behavioural insights into programmes addressing a wide range of issues, including sustainable consumption.

This paper uses behavioural science to illuminate five often unexpected barriers in moving consumers towards more sustainable behaviour. These insights, described in Section III, are:

1. **Many "choices" in consumption are often habitual behaviours;**
2. **Consequences of consumption are often hard to see;**
3. **Sustainable consumption may not seem personally relevant;**
4. **Behaviour is influenced by peers and social groups; and**
5. **It can be hard to follow through on sustainable choices.**

By understanding and acknowledging these and other tendencies, governments can work to design and deliver better, more cost-effective efforts to influence citizens towards sustainable consumption behaviour. This paper describes several examples of how policymakers and researchers have overcome—or leveraged—these behavioural patterns to achieve sustainable consumption objectives. There are numerous potential opportunities for behaviourally informed policy in sustainable consumption. For example, as referenced above, experts estimate developed countries could cut household energy consumption by 5-20% by adopting interventions based on behavioural science[50].

Yet this is only the beginning. While many behaviourally informed policies have thus far focused on managing energy and water consumption, less has been done, for example, to influence the unsustainable consumption of the growing number of low-quality, disposable consumer goods with negative environmental impacts.[12] Furthermore, documented policies using behavioural insights have, to date,

[12] For example, the world consumes about 80 billion new pieces of clothing each year, 400% more than the amount consumed two decades ago[91]; the environmental and social impacts of this consumption are significant[92].

disproportionately focused on developed countries; developing countries present many opportunities to apply behaviourally informed policy to sustainable consumption goals due to rapidly growing consumption patterns. Finally, many of the examples described above could achieve significant impact if they were scaled up or replicated (with consideration of local context) across sectors and communities.

A CALL TO ACTION

This paper is intended to serve as inspiration to policymakers and practitioners for new strategies to improve sustainability-based policies, services, and initiatives. The paper outlines major opportunities in consumption behaviours that are ripe for the behavioural science approach: energy and water consumption, transportation choices, shifts in diet, and behavioural challenges surrounding product choice, waste, and disposal. It is critical to strengthen national policies to more effectively encourage sustainable patterns of consumption and eventually change societal norms. Insights from behavioural science can play an important role in this effort.

This paper is also intended to serve as inspiration to researchers to continue pushing forward to discover and share new and novel methods for the global sustainable consumption movement, both in developed and developing countries. More documentation of behaviourally informed policies, both in the short- and long-term, is critical to the global adoption of this effective, valuable approach to shifting human behaviour.

Three recommendations for governmental leaders, researchers, and others working to achieve more sustainable consumption through policy are described below.

RECOMMENDATION

Incorporate Behavioural Science into Policy Processes and Tools

There is no single solution when it comes to shifting behaviours towards sustainable consumption. A multipronged approach that integrates behavioural science and other applied social sciences into the design of the right policy mix is essential. By applying behavioural science to existing policy levers such as regulations, economic incentives, and information campaigns, governments can maximize the effectiveness of policy undertakings. More and more governments, from the United Kingdom to Colombia, are explicitly incorporating behavioural insights into the way policies, services, and programmes are designed. After conducting initial pilot tests to demonstrate effectiveness, a continued commitment to scaling these strategies is critical.

RECOMMENDATION

Build Internal Behavioural Policy Capacity within Policymaking Entities

Building the internal capacity to consistently apply behavioural insights to policy within government can facilitate the broad application of these approaches and tools to the context of sustainable consumption. This allows resources to be devoted specifically to understanding and testing these applications to key areas or sectors of focus. Policy experts or teams can examine, for instance, the specific behavioural influences affecting how citizens use water resources, and then couple those findings with other governmental efforts that address other structural and political aspects (such as infrastructure improvements or tax strategies). To ensure more successful impact, behavioural policy experts should also test the effects of multiple behavioural strategies and scale effective approaches.

A number of governments have already recognized the value of such internal capacities and created specialized behavioural policy teams within their institutions, sometimes at the highest level. These teams specialize in the application of insights from behavioural science to strengthen government policy objectives and achieve low-cost successes in changing consumer behaviours (refer to page 8 for a list of national governments who have incorporated this approach).

RECOMMENDATION

Expand Behavioural Science Research Efforts and Dissemination

As interest in applying tools from behavioural science grows, documentation of the effectiveness of various strategies is crucial. Researchers and policymakers must continue work to discover and share new and novel methods of applying behavioural science for the global sustainable consumption movement. The body of evidence completed to date disproportionately represents the developed countries[19]; research and documentation of work in developing countries must continue to grow, especially since context plays such a crucial role in behavioural science. In addition, studies of long-term persistence of behavioural interventions are limited;[13] expanding this type of body of evidence is critical to the global adoption of this effective, valuable approach to shifting behaviours towards sustainability.

[13] One exception to this is in energy: the effects of various strategies on the persistence of Opower's outcomes in social norms have been explored[54].

CLOSING REMARKS

Over the last decade there has been increasing recognition about the importance of changing consumer demand patterns to effectively deliver policy outcomes related to Sustainable Consumption and Production (SCP). As governments have agreed on the new Sustainable Development Goals (SDGs) and recognised the need for all countries to implement the 10 Year Framework of Programmes (10YFP) on SCP patterns, this has been paralleled by an alarming rise in resource consumption. If our goal is to develop effective and evidence-based national policies that shift this trend, policies must lead to changes in behaviour. Human actions are the prime causes of today's good or harmful environmental outcomes[90].

A growing body of evidence suggests that using insights from behavioural science can improve the design and effectiveness of governmental policies and programmes in all domains, including those targeting behaviour change for sustainable consumption. It is the hope of the experts and institutions involved in developing this publication that policymakers and practitioners may follow the recommendations described herein and incorporate behavioural insights into policies that support sustainable consumption. Further research on the application of behavioural science in developing countries will help strengthen the body of evidence supporting this approach as a broadly effective tool to change consumption behaviours and help achieve many of the Sustainable Development Goals (SDGs).

As a resource for testing this approach, the 10YFP Consumer Information Programme (CI-SCP) provides a platform for developing and experimenting with such new policies and programmes. The CI-SCP network of experts, practitioners, and consumer-facing organizations provides a collaborative environment and test-bed for new ideas; its status as a UN-backed programme with a mandate for implementation under the Sustainable Development Goals provides a means for governments to fulfil international objectives, and use its profile to showcase and share their successes and intentions.

By building policies and programmes that are centred on a better understanding of human behaviour, we can dramatically expand our effectiveness with little extra cost. We can begin to shift some of the billions of small decisions and actions that we make each day, and ultimately create a more sustainable future on our planet.

SELECTED RESOURCES

on Policy, Sustainable Consumption, and Behavioural Science

In addition to the cited references listed at the end of this paper, the following sources may be particularly helpful for policymakers seeking to understand the potential for applying insights from behavioural science to sustainable consumption policy.

OECD. Behavioural and Experimental Economics for Environmental Policy (BEEP). 2015.

The OECD Environment Directorate has launched a new project to use scientific insights from behavioural economics to improve environmental policy.

The OECD also has a portal and web page that is include OECD work on Behavioural Insights: http://www.oecd.org/gov/regulatory-policy/behavioural-insights.htm

Mont O, Lehner M, Heiskanen E. Nudging: A tool for sustainable behaviour? 2014.

This report was produced by the Swedish Environmental Protection Agency (Swedish EPA) in 2014 to collect existing knowledge about the effects of behavioural interventions (i.e. "nudging") on consumption and the environment.

Behavioural Economics in Action "How-To Guides" at Rotman School of Management, University of Toronto.

The University of Toronto's programme on Behavioural Economics has produced a series of How To Guides in applying and learning about behavioural insights, producing guidebooks that could be applied to policies for sustainable consumption as well: The 1-2-3-4s of Behavioural Insights; A Practitioner's Guide to Nudging; Towards a Taxonomy of Nudging Strategies – The companion report to the Practitioner's Guide to Nudging; and Nudging Around The World.

European Union portal for Behavioural Insights and 2008 Conference on "how can behavioural economics improve policies affecting consumers?"

"Many areas of public policy increasingly seek to shape and influence the behaviour of consumers or to empower them to make better choices. For example, at the European level, consumer behaviour is central to the debate over nutritional and environmental labelling, sustainable consumption, bank account switching, consumer contract law, alcohol and tobacco policy, energy and mobile telephone regulation. The conference on Behavioural Economics, which took place on 28th November 2008, was designed to bring together researchers, policy-makers and stakeholders to explore these new challenges and identify the next steps." Successive conferences have also taken place with information available here:
http://ec.europa.eu/consumers/consumer_evidence/behavioural_research/index_en.htm
http://ec.europa.eu/consumers/dyna/conference/index_en.htm

European Union Future Brief: "Science for Environment Policy: Green Behavior" October 2012

http://ec.europa.eu/environment/integration/research/newsalert/pdf/FB4_en.pdf

GLOSSARY
of Behavioural Psychologies in this Document

The following behavioural psychologies appear in this document. There is no standard set of definitions for behavioural psychologies, and many of these psychologies complement, overlap, and interact with each other. However, the following list is a useful guide to understanding some of the behavioural insights identified and applied by ideas42.

Active choice	A decision that requires individuals to make an explicit choice for themselves.
Behavioural economics	Behavioural economics applies insights from psychology to theories in economics to increase the explanatory and predictive ability of the discipline.
Channel factor	Adding a feature to the environment that facilitates behaviour by making that behaviour easier to accomplish. The new feature smooths the path to action. For instance, if trying to increase the likelihood of a person keeping an appointment with a new doctor, include a map to the doctor's office in the upcoming appointment confirmation email.
Choice architecture	Designing ways in which choices are presented or framed to individuals, which subsequently affects their decisions.
Cognitive dissonance	The state and/or feeling of disharmony and discomfort individuals experience when they hold two conflicting beliefs at the same time. In order to reduce the discomfort and resolve their inconsistent ideas, individuals will often change one of their beliefs or rationalize a new belief to justify the two existing ones.
Contextual features	Situational factors that affect how individuals make decisions and possibly contribute to behavioural problems in the given environment. It is important to not overlook the physical or mental context of situations as well as small details of context as they can have disproportionately large effects on outcomes.[14]
Construal-level problems	The construal level theory explains how individuals' thoughts and behaviours (e.g., regarding objects, events, etc.) are influenced by the psychological distance (i.e., temporal, spatial, social or hypothetical distance) of those objects and events. An individual will have more concrete thinking about an object or event that is close, while further objects will generate more abstract thinking.
Default	The outcome that results for an individual when no action is taken.
Feedback	Providing performance information to an individual about current behaviour on an on-going basis as a way to make information salient and allow an individual to evaluate his or her own performance relative to an abstract standard.
Habitual behaviours (habits)	Behaviours that no longer require conscious thinking to be carried out, but have become automatic and routine.

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Hassle factors	Hassles—real or perceived—can act as surprisingly large deterrents, although it is the perception of hassle that is often the unexpected problem. Small hassle factors in a process can deter people from completing the process, regardless of their initial intentions or the magnitude of the incentives.
Identity	Individuals have multiple identities, which are active in different contexts and shape the choices and decisions we make. Priming different identities can influence behaviour, something well understood by the advertising industry.
Intention-action gap (or value-action gap)	There is often a disconnect between the intentions that an individual has, and the action that an individual actually takes. As a result, it is difficult to determine intentions from outcomes alone. Many findings from behavioural science help explain why we may fail to follow through on our plans, despite our good intentions.
Motivated reasoning	The tendency to process information in a way that fits our already establish believes and ideas. Individuals either disregard information that contradicts their beliefs or seek out and focus on evidence that confirms and proves their ideas.
Overconfidence	We often overestimate our abilities to make decisions and take actions, which can get us into trouble when we are in challenging situations.
Personalized information	Tailoring information particularly to the individual and his/her concerns, as well as having it come from one, or a small group of trusted and reputable people can effectively influence behaviour.
Physical cues	Physical features of an environment that affect decision making through automatic, reflexive processing by the brain rather than deliberate, conscious choice.
Present bias	Individuals overweight present costs and benefits relative to future ones. This often leads us to put off unpleasant tasks repeatedly, or fail to make near-term investments for long-term gains.
Reciprocity	The social expectation that people will respond with similar weight and emotion to another person's action. Doing favours or giving gifts can prompt this feeling in the recipient and contribute to building a relationship.
Salience	The more relevant and "real" something feels, the larger it looms in our mind and the more likely we are to expect it to happen, remember it, or think of it in general.
Social norms (social pressures; social influence)	We feel pressure to act in a socially acceptable way when interacting with others. We also look to other people's actions to get a sense of what we should be doing.

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About the 10YFP

The 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns (10YFP) is the global framework for action to shift towards sustainable consumption and production (SCP), in both developed and developing countries, adopted by the international community at the Rio+20 Conference in 2012.

The 10YFP generates collective impact through multi-stakeholder programmes and partnerships, which develop, replicate and scale up SCP policies and initiatives at all levels. The 10YFP also fosters knowledge and experience sharing, and facilitates access to technical and financial resources for developing countries. UN Environment serves as the 10YFP Secretariat. The central role of the 10YFP in achieving the shift toward SCP is affirmed in Agenda 2030 for Sustainable Development and a specific target of the Sustainable Development Goals (12.1) calling for its implementation.

There are currently six thematic and sectoral programmes bringing together over 450 actors from all regions to deliver support on Consumer Information for SCP, Sustainable Lifestyles and Education, Sustainable Food Systems, Sustainable Buildings and Construction, Sustainable Tourim and Sustainable Public Procurement. The 10YFP programmes focus on: 1) Building synergies and cooperation, bringing together existing initiatives and partners, leveraging resources towards common objectives; 2) Scaling up and replicating successful policies and best practices for SCP, responding to national and regional needs, priorities and circumstances; 3) Generating and supporting new projects and activities on SCP in response to regional and national priorities and needs, as they emerge.

For more information, visit www.unep.org/10yfp

About the Consumer Information for SCP programme of the 10YFP

The Consumer Information Programme for Sustainable Consumption and Production (CI-SCP) is one of six programmes under the 10YFP. It is co-led by Germany through the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety; Indonesia, through the Ministry of Environment and Forestry; and Consumers International. A Multi-stakeholder Advisory Committee (MAC) oversees the programme's coordination and implementation, and collaboration is encouraged from all sectors and regions. The programme aims to support the provision of quality information on goods and services, to engage consumers in sustainable consumption, through developing and raising the profile of projects and policies. Much of the programme's work will draw on behavioural insights and economics, applying them to projects and communications to help consumers act on their sustainability intentions.

For more information or to get involved, contact CISCP@unep.org

The current trajectory of growth in demand and consumption of our planet's natural resources is unsustainable. Solving this problem is vital to the future of our and other species. Individual behaviour plays a significant role in consumption, and policies that focus on shifting consumer behaviour towards more sustainable patterns are crucial to achieving a sustainable future.

Changing consumption patterns and promoting sustainable lifestyles is at the core of the 2030 Agenda for Sustainable Development. It also represents one of the greatest challenges of our time. The objective of this publication, developed in cooperation with the Consumer Information Programme for Sustainable Consumption and Production (CI SCP) of the 10 Year Framework of Programmes on SCP patterns, is to shed light on opportunities to strengthen the effectiveness of policies for sustainable consumption in both developed and developing countries, with developed countries taking the lead. The publication provides evidence-based insights from behavioural science, detailing five key behavioural barriers to sustainable consumption. It also includes concrete examples of how behavioural science has been successfully coupled with policy to cost-effectively achieve sustainable consumption.

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