

Behaviour Change: A Series of Practical Guides
for Policy-Makers and Practitioners

Number 4

Triggering Widespread Adoption of Sustainable Behaviour

Summer 2006

Brook Lyndhurst



1. Introduction to the series	2
2. Project summary	3
3. Key findings	4
Malcolm Gladwell’s Tipping Points	4
Phillip Ball’s “Critical Mass”	5
Mark Buchanan’s “Ubiquity”	6
4. Policy implications	8
Concept	8
Policy Implications	8
Suggestions for further research	10
5. Supplementary information	11
Appendix I – Switching off the lights	12

Defra has commissioned and funded this study, but the views expressed in this guide do not necessarily reflect Defra policy.

1. Introduction to the series

Defra's 5 year strategy (*Delivering the Essentials of Life*¹) coupled with the UK Government sustainable development strategy (*Securing the Future*²) set out an ambitious agenda for environmental leadership and sustainable development. Embedding these core principles relies on influencing change and making it easier for producers and consumers to behave more sustainably. This is a sizeable task, since changing behaviours is a complex matter and innovative solutions are required.

In July 2005, Defra initiated a programme of research that aimed to broaden understanding of how Government (and others) can most effectively promote pro-environmental behaviour amongst producers and consumers. Several studies were commissioned as part of this research programme, each with a remit to explore a unique aspect of pro-environmental behaviour change.

This practical guide forms part of a series of papers that aims to summarise the key findings and policy implications from these studies.

A full list of titles in this series is provided below:

- Number 1: Sustainable Resource Use in the Home
- Number 2: Targeting Specific Lifestyle Groups
- Number 3: Sustainable Development as a "Collective Choice" Problem
- Number 4: Triggering Widespread Adoption of Sustainable Practices
- Number 5: Understanding Choice
- Number 6: Sustainable Shopping and Sustainable Production
- Number 7: Enhancing Sustainability at Farm Level
- Number 8: Tackling the Waste Challenge
- Number 9: Encouraging Sustainability Amongst Small Businesses
- Number 10: Sustainable Resource Use in Business and Organisations

¹ Defra (2004) *Delivering the essentials of life: Defra's five year strategy*, London: HMSO.
See <http://www.defra.gov.uk/corporate/5year-strategy/index.htm>.

² Defra (2005) *Securing the Future: UK Government Sustainable Development Strategy*, London: HMSO.
See <http://www.sustainable-development.gov.uk/publications/uk-strategy/index.htm>.

2. Project summary

"Things should be made as simple as possible, but not simpler"
Albert Einstein

This Practical Guide presents the summary results of a short period of research and reflection by a study team at Brook Lyndhurst. Commissioned as a 'think piece', it is particularly focused on the potential implications for policy-makers of recent developments in theories of behaviour change and social networks.

Recent attention on the means of achieving environmental policy objectives has prompted a renewed focus on 'behaviour change' and a rash of research, analysis and policy development.

However, as E O Wilson, Harvard Professor and eminent biologist, puts it:

"To address human behaviour systematically is to make a potential topic of every corridor in the labyrinth of the human mind, and hence to consider not just the social sciences but also the humanities, including philosophy and the process of scientific discovery itself."

In narrowing the field of enquiry and building upon recent Defra and ESRC funded research, the genesis for this think-piece was a question about the *diffusion* of pro-environmental behaviours through society over time. In particular, the Brook Lyndhurst research team wondered: might pro-environmental behaviours follow an S-curve development path; and, if so, could 'behaviour change' policies (as opposed to legislation) be configured so as to nudge development along such a path?

Drawing on literature from the field of environmental behaviour change and cross-disciplinary texts encompassing biology, physics and economics, we focused upon three models that can be used to explain the diffusion of environmental behaviours through society. Through reflecting on the similarities between these theories, we identify a range of potential policy implications.

This paper is a think piece as opposed to an exhaustive analytical exercise. It is intended to provide argument and evidence in support of a proposition that radical policy options for developing pro-environmental behaviour change need to be considered, and to provoke the reader accordingly.

3. Key findings

Much of the work on environmental behaviours thus far has focused on the individual³. As Tim Jackson puts it:

“My behaviour in any particular situation is a function partly of my attitudes and intentions, partly of my habitual responses, and partly of the situational constraints and the conditions under which I operate. My intentions in their turn are influenced by social, normative and affective factors as well as by rational deliberations. I am neither fully deliberative nor fully automatic in this view. I am neither fully autonomous nor entirely social. My behaviours are influenced by my moral beliefs, but the impact of these is moderated both by my emotional drives and my cognitive limitations.”⁴

Whilst this quote clearly acknowledges the social context for individual behaviour, it is nevertheless ‘my’ behaviour upon which attention is focused. Attention upon group behaviour is, of course, the focus of a wide range of disciplines, including economics, sociology, anthropology and political science. Our focus in the present context was on work, or analysis, which bridged the gap from individual to group behaviour, and we reviewed contributions from – for example – Schelling (“Micromotives & Macrobehaviour” 1978) Canetti (“Crowds & Power” 1960), and Dennett (“Darwin’s Dangerous Idea”, 1996)

These and other authors consistently threw light on the notions of ‘emergence’ – the way in which group properties cannot be imputed from the properties of the individuals that comprise that group – and ‘networks’ – the way in which the pattern of linkages between individuals plays a role in the way they function as a collective. The work of three modern thinkers, in particular, provided models for considering the ways in which individual and collective behaviour relate, and for understanding the ways in which changes in behaviour diffuse through society.

Malcolm Gladwell’s Tipping Points

In his book ‘Tipping Points’, Gladwell notes that ideas, products, messages and behaviours spread in a viral manner. As a result, little changes have big effects and such changes happen “in a hurry”. Gladwell proposes that the operation of these Tipping Points is dependent on the nature of relationships between three key types of individual – connectors, mavens and salesman – whose interaction brings about the kinds of diffusion with which we are concerned.

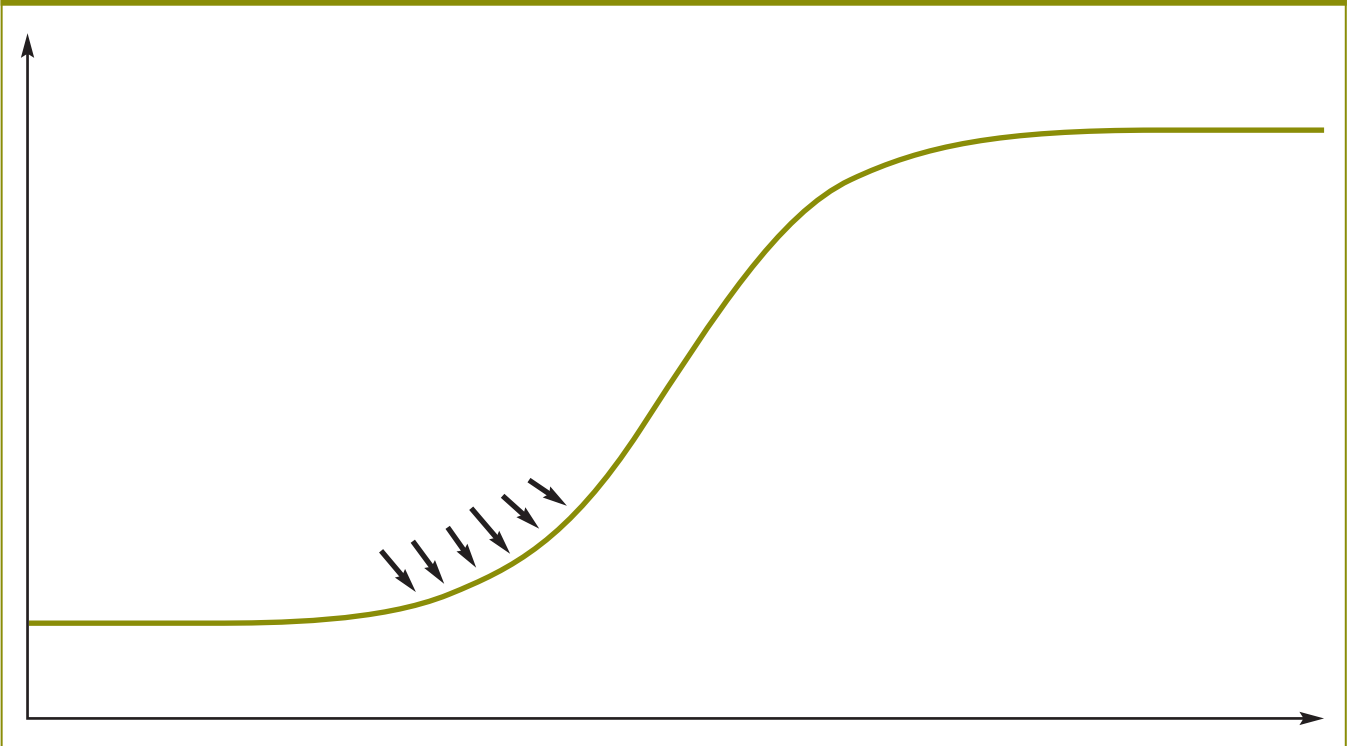
Whilst superficially appealing, the ‘tipping point’ argument stops short of being able to say just how many such individuals are ‘required’, and in what settings, to bring about rapid diffusion. It provides the basis for a powerful backward-looking description of change, but little in the way of transferable policy conclusions.

Nevertheless, the S-curve model implied by Gladwell’s analysis suggests that there *could be* some set of interventions – carefully targeted in the ‘critical zone’ highlighted in Model 1, and focused upon particular groups within society – that might catalyse change and prompt development along the S-curve.

³ Our study drew on a variety of recent explanatory analyses, and applied them – by way of example and clarification – to the pro-environmental behaviour of switching off lights. Appendix 1 provides a schematic summary of our analysis.

⁴ Full references are provided in our Full Report, see http://www.defra.gov.uk/science/project_data/DocumentLibrary/SD14006/SD14006_3516_FRP.doc. An indicative reading list, including Tim Jackson’s 2005 review of the literature on motivating sustainable consumption, is provided in Section 5 of this Practical Guide.

Model 1: The S-Curve



Phillip Ball's "Critical Mass"

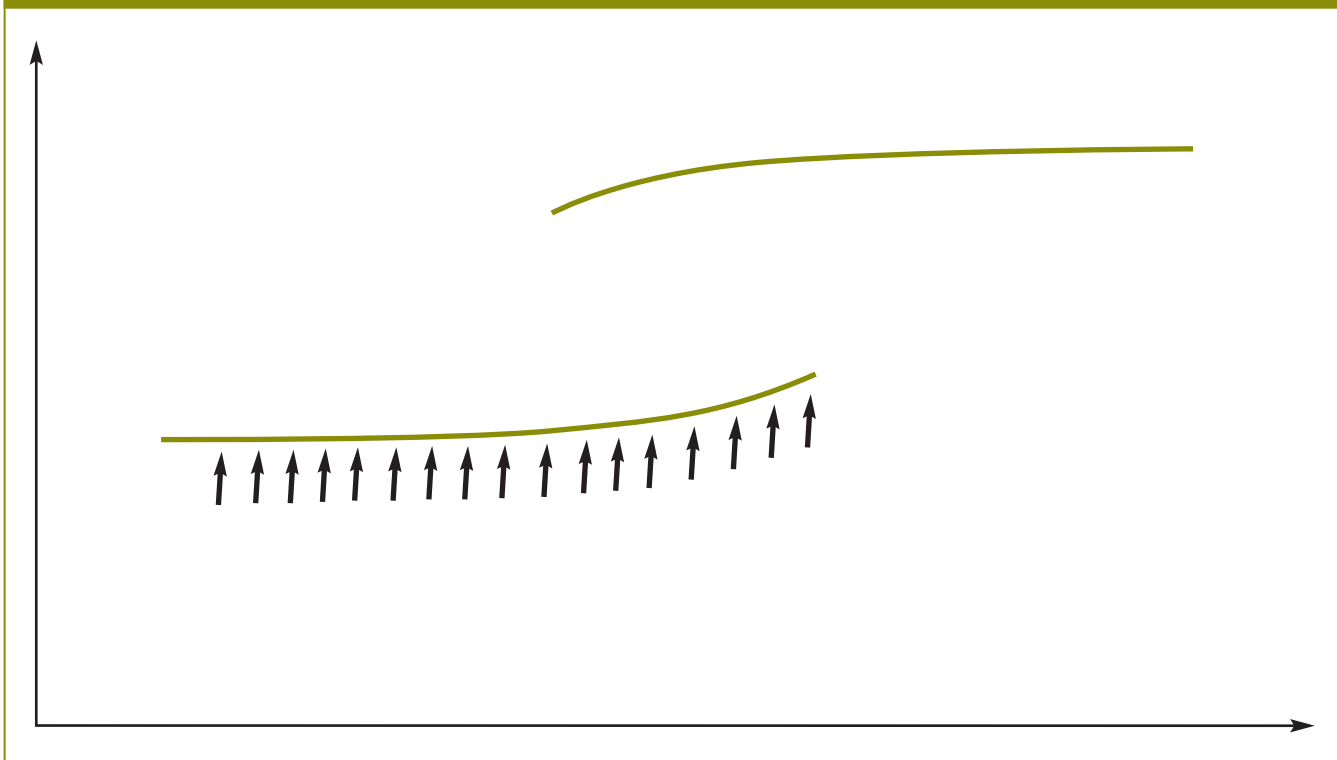
A deeper analysis by Phillip Ball, drawing parallels between emergent properties in the domain of physics and in social settings, finds that:

- non-equilibrium states are normal (that is, social systems are usually in flux);
- conditions in such states can be either stable, or "metastable" (ready to change, but not actually changed);
- metastability means that systems can persist in arrangements (over time) well beyond what might be supposed from an assumption of smooth transition; and
- such systems do not exhibit smooth transition, nor even rapid transition of an S-curve form, but 'jump', extremely rapidly, through a *phase transition* (in the way water turns to ice, for example).

What is distinctive about Ball's analysis is not merely that he proposes change happening very suddenly once the 'critical mass' is achieved (see Model 2), but that there is no way of knowing, in advance, exactly when the change will occur. It could occur relatively early as the pressures for change build, or it could take a great deal longer.

3. Key findings

Model 2: Phase Transition



The 'phase transition' model, then implies that interventions, targeted on the basis of research evidence, would need to be sustained over a period of time, since the prevailing metastable state will jump to its new state at some point which cannot be predicted in advance. Interventions would need to be sustained (in the absence of positive feedback) until such time as the jump took place.

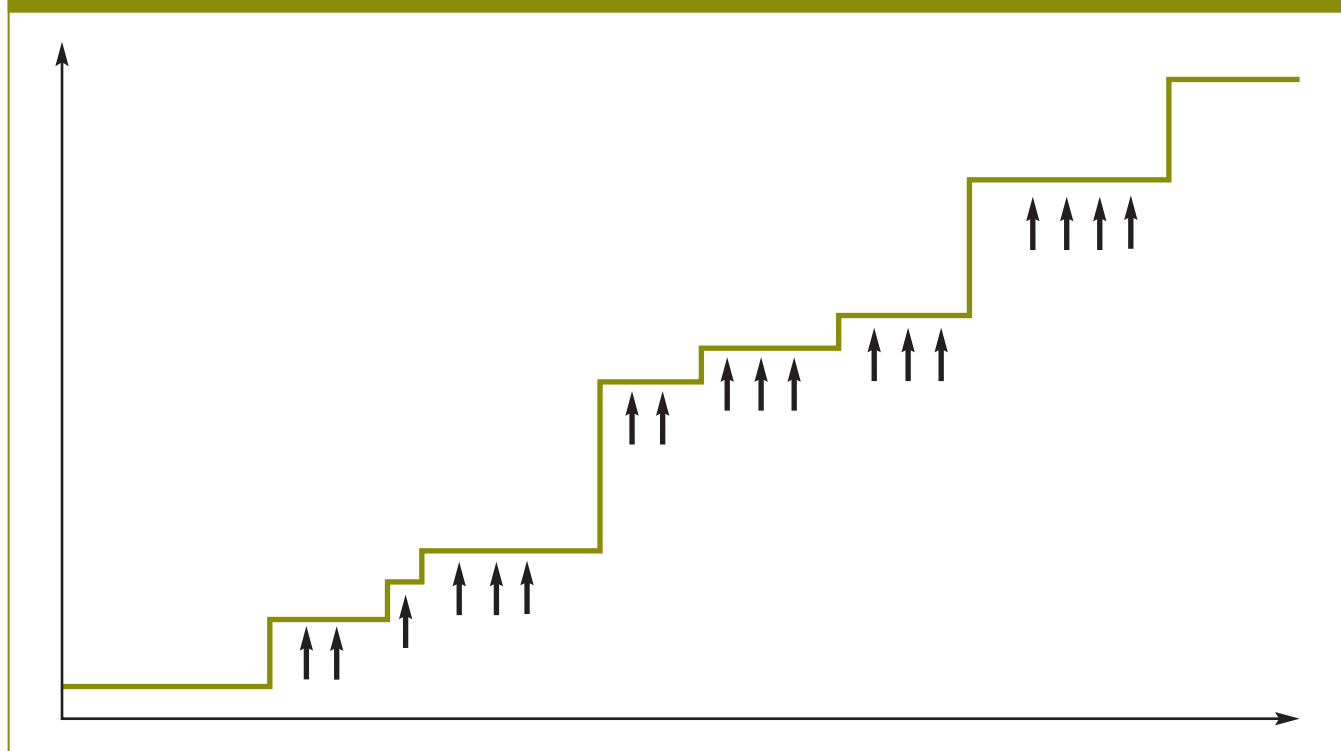
Mark Buchanan's "Ubiquity"

Drawing on cross-disciplinary research, Mark Buchanan concludes that in all complex systems there are always small numbers of big things/events and large numbers of small things/events. More importantly, he concludes that the magnitude of an ensuing event is formally unpredictable at the outset. His analysis suggests that, within and across each and every group within society, there is the possibility of dramatic change, but little or no way in advance of knowing how and where such change will occur. He suggests that we may have a situation in which [dramatic] change can occur in some parts of the system, with little or no immediate impact on others.

Rather than a smooth pattern of change – the S-curve – or a sudden jump – the phase transition – what we may in fact be dealing with is something akin to 'punctuated equilibrium', in which change happens in fits and starts.

The ensuing stepwise model, would imply a set of targeted interventions, but this time in episodic fashion, and throughout the development path (see Model 3). Unlike either of the two previous models, there is no point in the process where some 'natural' force automatically ensures that the next step will be taken; effort/intervention may be required from beginning to end.

Model 3: Power Law



Whilst these analyses are at first sight very different and at times apparently inconsistent, our interpretation identifies three important, common factors.

- Inherent Uncertainty.** The Gladwell analysis (S-curve) *cannot* tell us precisely how many and which Connectors, Mavens and Salesmen will be needed to catalyse a transformation. The Ball model (phase transition) *cannot* tell us precisely when a change will occur. The Buchanan approach (punctuated equilibrium) *cannot* tell us which steps will be large and which small. These limitations are not an outcome of weak analysis, or poor understanding, or a shortage of data: they are *inherent, emergent properties of the large, open, complex systems that our societies are*.
- Networks.** The mechanisms by which pro-environment behaviour change will take place will be among *groups in society that are network-based*. Better understanding of which networks are functioning, in what ways, with respect to different types of environmental behaviour – switching off lights, recycling, walking rather than driving, and so forth – will add powerfully to the ability of policy-makers to target their endeavours.
- Broad targeting** is not merely appropriate, it is essential. Within all network systems, there will be foci of greater influence, either because of the strength of linkages, the frequency of linkages, or linkages to other networks. Identification of key intervention points will not merely be more resource efficient, it will maximise the *chance* of having any influence at all on the system in question. Rather than just focusing on key groups, policy should be focusing on groups whose network properties best lend themselves to the diffusion of change, in order to boost the probability of success.

4. Policy implications

Concept

Taken together, the three elements identified by our analysis – inherent uncertainty, network based, targeted intervention – culminate in the idea that policies to promote pro-environmental behaviour cannot, in fact, aim to ‘nudge an S-curve’. Such an idea falls into the trap of presuming a potential linear connection between cause and effect, between intervention and outcome.

Instead, the radical idea presents itself that *policy should be attempting **perpetually** to ‘seed’ or catalyse change*, through a wide variety of mechanisms, in a wide variety of places. A range of fundamental features of the social system mean that a model of policy intervention predicated on the steady refinement of interventions towards a set of policies that ‘work’ may be ill-founded. Rather, given the complexities of ‘behaviour change’, a model of ceaseless innovation, within broad parameters of focus and in a network setting, offers a potentially valuable conceptualisation of how to move forward.

We acknowledge that, in many respects, the quest for ‘innovation’ is already embedded into policy-making – the Environment Action Fund, for example, is predicated on a wide range of innovative interventions, and the ‘Engage, Encourage, Enable, Exemplify’ model in the UK Sustainable Development Strategy similarly aims to catalyse change. The interesting element of our findings is not the need for innovation per se but the need for *perpetual* innovation in a setting of inherent uncertainty and in the absence of an ultimately effective set of policy interventions towards which to refine policy.

Policy Implications

In navigating from concept to delivery we suggest that there are six lessons for policy that warrant consideration. They are necessarily preliminary – the purpose of this ‘think piece’ is to offer and provoke thoughts for debate and discussion.

Tolerate waste and take risks

We have seen that, given the inherent uncertainty of social structures, changing behaviour requires acceptance of the fact that a proportion of interventions will not have any effect. Furthermore, *apparently* ineffective interventions may in fact be contributing to the metastability of social systems, thereby making them more responsive to future triggers for change. As with Buchanan's sand experiment it is not only the last grain of sand that falls which causes the landslide.

We therefore see risk-taking as an inevitable part of behaviour change policy-making. Furthermore, the risk-taking is not something to be done in the ‘early days’ of new policy development, it needs to be an inherent and on-going feature of policy intervention going forward⁵.

Build on successes but avoid over-specifying policies

Whilst broad *strategic* targeting of policy is a central conclusion of this think piece, over-specifying policies aimed at *tactically* nudging this essentially unpredictable system should be avoided.

⁵ We therefore welcome the amendments which have been made to the current round of the Environment Action Fund taking into account criticism of its predecessor “*The EAF is not considered to be innovative or daring enough to support sustainable living*”, Review of the Environmental Action Fund, Quadrangle, 2001.

Detailed knowledge on the behaviours, motivations, desires etc of groups (networks) and the interrelations (linkages) between them will help to construct policies which **should** work, but in the absence of causality we cannot be sure that they **will** work.

We therefore suggest a pragmatic rather than strictly empirical approach to policy formulation, focussing on case studies, of both successes and failures, rather than searching for deterministic cause and effect rules for societal behaviour change.

Statistic rather than ballistic approach

As seen in Jackson's review, behaviour drivers are complex. Far from being the outcome of rational deliberation, behavioural choices are often subconscious and inconsistencies between beliefs, attitudes and behaviours are common. In addition, choices are made subject to a multiplicity of often conflicting behavioural drivers.

Finding out the relative importance of the many factors at play is not practical. The relative weights assigned to factors is likely to vary between individuals, between groups and over time; and, in the absence of causality, tailoring policies even to the extreme 'segment of one' offers no guarantee of success.

Instead policy should aim simultaneously to intervene on multiple levels in order to maximise the *probability* of behaviour change. In the absence of legislation which forces the individual to abide by behavioural laws vis-a-vis the environment, behaviour change policy lends itself to multiple smaller interventions. These should span the breadth of behavioural drivers identified by Jackson's review – attitudes, efficacy, contextual factors etc. Monitoring and evaluation will have an important role to play in guiding the spread of interventions, but should not be aiming to reach *conclusions* on what is right.

Focus on the common denominator of groups & networks

The issues that provide the basis for belonging to a group – the nature of the network linkages – are the appropriate locus for intervention with that group, or network. If the linkages are, for example, inherently spatial, then interventions that are spatial will have the greatest chance of 'traction'; if the linkages are predominantly concerned with belief, then interventions will need to be structured accordingly.

For example, we conjecture that the fact that faith groups share a common set of beliefs upon which they act in their everyday lives is likely to make them more susceptible to 'belief based' policies – such as those which foster concern for the environment. Places of worship may thus lend themselves particularly well to information based policies which aim to encourage pro-environmental value sets, as recent projects run by the London Sustainability Exchange suggest.

Alternatively, since the binding element for a group of neighbours is undoubtedly the local area, it follows that using neighbourhood groups to further the liveability agenda will be most likely to succeed. Similarly, the fact that certain pro-environmental behaviours are 'visible' to neighbours suggests that, for example, the presence of green boxes (or their equivalent) will play an important role in promoting recycling behaviour.

4. Policy implications

Hitchhike on consumer marketing

There is no doubt that the greatest expertise in the art of persuading people to change their behaviours is found in the field of marketing. In formulating interventions, policy should continue to make more explicit, strategic and tactical use of this kind of resource.

The recent report 'Painting the Town Green', from Green Engage (a loose coalition of organisations including Transport 2000, WWF, Sustain and others) makes essentially this point – that the 'green' agenda needs to adopt the techniques of mainstream marketing if it is to extend its message(s) to the mainstream of society.

From Pilots to Crystals

Finally, we wish to suggest that interventions need to progress from a model in which novel ideas are piloted, refined, and then (if successful) rolled out, to one in which novel ideas are used *perpetually* to seed, or catalyse, or act as crystals for, pro-environmental behaviour change.

This is akin to the way in which, in a liberalised market economy, commercial success emerges not from 'perfecting' a product/service then rolling it out, but rather through the process of endless innovation. Yesterday's perfect product may still be just as 'good' tomorrow, but the world will have moved on, expectations will have evolved – behaviour will have changed. Similarly with interventions intended to promote pro-environmental behaviour – yesterday's perfect project may simply not work tomorrow because the world has moved on.

(Note that the 'within broad parameters' argument still applies – the innovation needs to happen within reasonable bounds, rather than at random. Monitoring and evaluation are still required, though the use to which their outcomes are put may need to change.)

Suggestions for further research

Given the context for these conclusions, much remains to be done. The basic thinking needs to be tested, and thoroughly. Further consideration of network theory, and the practical requirements of analysing networks in the 'real world', needs to be undertaken. The potential implications for policy formulation, for monitoring and evaluation, for measuring 'success', need to be fully thought through and explored.

In our judgment, further research and analysis of this kind would be worthwhile, on two main grounds. On the one hand, the scale of behaviour change required to bring a genuinely sustainable society into being is, it would seem, enormous. On the other, the range and complexity of factors required to explain behaviour (and the subset 'pro-environmental behaviour') is such that a longitudinal approach (considering diffusion over time) appears to have some useful advantages over a cross-sectional approach.

In short, it seems that, whilst it may not be possible to 'nudge an S-curve', it might be possible to '**coax diffusion**' – and that still seems preferable to old-fashioned carrots and sticks.

5. Supplementary information

Suggested Further Reading

- Motivating Sustainable Consumption – A Review of Evidence on Consumer Behaviour and Behaviour Change, Tim Jackson, 2005
http://www.sd-research.org.uk/MotivatingSCfinal_000.pdf.pdf
- Painting the Town Green, Green Engage, 2006
<http://www.transport2000.org.uk>
- The Tipping Point – How Little Things Can Make a Big Difference, Malcolm Gladwell, 2000
- Critical Mass – How One Thing Leads to Another, Philip Ball, 2004
- Ubiquity, Mark Buchanan, 2002
- Bad Habits and Hard Choices, Brook Lyndhurst, 2004
<http://www.brooklyndhurst.co.uk/articles.php?smid=192>
- Household Waste Behaviour in London, Parts I and II, Brook Lyndhurst for RRF, 2001-2004
<http://www.brooklyndhurst.co.uk/publications.php>

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Barriers to switching off the lights

A schematic study illustrating factors influencing pro-environmental decision-making at the individual level.

Cognitive Deliberation

The availability of information and acknowledgement of consequences

- The individual did not know that leaving the light on costs money and/or is responsible for the emission of Greenhouse Gas (GHG).

Perceptions of value and acceptance of responsibility

- The price of electricity was so low that it made no difference and the individual did not feel responsible for GHG abatement.

Efficacy (how good you think you'd be at it)

- The individual is worried that they will not be able to operate the light-switch.

Personal Factors

Overarching personal goals (looking after your family, being happy etc)

- The light being on or off makes no difference to the individual's personal goals.

Altruistic tendencies

- The individual is not altruistic.

Environmental concern

- Although *aware* of the negative environmental consequences of leaving the light on, the individual does not care.

Symbolic self completion – defining yourself through what you do/own

- The individual defines themselves in ways that do not include a commitment to energy efficiency.

The quest for consistency in 'self concept' (who I am, who I could be, what others think of me, what others expect of me)

- The individual pays no attention to the consistency or otherwise of his/her acts.

The attitude-behaviour gap

- Although aware and concerned about negative environmental consequences of leaving the light on, the individual does not act on these concerns.

Automatic/Subconscious Reflexes

Habits

- The individual never turns the lights off, and never thinks about the fact that he never turns the lights off.

The Influence of Others

Subjective norms (what people you care about expect of you)

- Either no-one known to the individual cares about energy efficiency; or the individual doesn't care what others think.

Descriptive norms (how others behave)

- No-one else appears to turn the lights off.

Group membership and belonging (wanting to be like people like you, wanting to be different from people who aren't like you)

- The individual is a member of several social groups, and energy efficiency is not important to any of them. Also, the individual does not want to be like 'the people that turn the lights off'.

Social Structures and Groups

The relationship between the group and its individual members

- The individual sees no advantage to him/herself within the groups of which he/she is a member, even if 'energy efficiency' is salient within the group.

Social structures and networks

- The groups of which the individual is a member are structured in such a way that energy efficiency messages are lost or overwhelmed.

The relative salience of potentially opposing norms in a particular situation

- The social pressure to get to the pub outweighs the social pressure to turn off the lights.

External Factors

Contextual factors

- The lights in the building are controlled centrally – the individual cannot switch them off without persuading with the caretaker.

Injunctive norms (legislation etc)

- There is no law against leaving the light on.