Not a Problem, Someone Else's Problem, My Problem or Our Opportunity? Shifting Attitudes and Behaviour on Mitigating Climate Change

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This background paper was prepared by Catherine Leining, a Policy Fellow at Motu, for participants in Motu's Low-Emission Future Dialogue. This group of stakeholders and technical experts from government, the private sector, academia and NGOs is meeting regularly over 2014–15 to discuss New Zealand's possible pathways toward a global low-emission future. The Dialogue aims to build understanding among participants, identify common ground, and use progressive in-depth discussions to generate and develop innovative solutions, not to generate consensus. The Dialogue builds on Motu's Climate Dialogue, which ran in 2007, and Motu's Agricultural Emissions Dialogue, which ran for 10 meetings through 2011–12.

Executive summary

Individuals can have a significant impact on climate change mitigation through the collective impact of their direct behaviour and their support for action by others. Although the scientific and economic case for significant mitigation is growing, our social attitudes and practices are not responding in kind. This paper offers insights into different dimensions of shifting individual and social behaviour on mitigation. Drawing on literature from the fields of psychology and social science, as well practical case studies, the paper examines psychological barriers to mitigation action, models for pro-environmental behaviour change, and two examples of applied approaches to behaviour change (community-based social marketing and Theory U).

Although this review has been too cursory to permit conclusive recommendations, some emergent insights could merit further consideration:

1. People can contribute to climate change mitigation not just as individual actors but also as political and organisational actors. People can act cooperatively and support collective changes that they may not be willing to make – or pay for – voluntarily on their own. They can also produce positive climate change outcomes for non-environmental reasons. Transforming social behaviour to reduce emissions may require inspiring individual change across many roles and motivations. We should think carefully about how individuals can make the most effective contributions to mitigation in the New Zealand context.

2. People's ideologies and world views, as well as social norms and networks, have a fundamental impact on how they receive and respond to information about climate change. As social creatures, people depend on group association and feedback for their core sense of personal identity and security. We need to find ways to frame effective mitigation behaviours so they appear more congruent with people's identity cues across a range of ideologies and world views, and start to shift social norms.

3. Mitigation behaviour is strongly correlated with personal values. Appealing to self-interest values, such as personal cost savings, may help to engage more people in low-cost mitigation behaviour, but may reinforce self-interest values

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at the expense of the self-transcendent values that may be needed for truly transformational change.

4. People's emotional responses to climate change are important predictors of their willingness to mitigate – both personally and through policy support. "Fear appeals" can trigger people to disengage, especially when impacts seem remote and outside of personal control. In contrast, people appear to respond more constructively and positively to feelings of worry, interest and hope. Different approaches to framing climate change issues (e.g. environmental, economic, security, social, cultural, ethical, health and spiritual) can influence people's emotional responses and willingness to engage.

5. In New Zealand and other countries, people remain fragmented along the spectrum of beliefs about climate change outcomes and mitigation efficacy. Communicating scientific and economic information about global impacts and global solutions is useful but not sufficient to shift personal beliefs and drive personal behaviour change. More effort may be needed to address perceptions about personal risks from climate change (i.e. to individuals, their loved ones and the things they value) and personal efficacy in taking action. We also need to consider carefully how information is communicated to different audiences and by whom.

6. Attitude is only one driver of behaviour. Contextual drivers (e.g. personal capabilities and habits, material costs and rewards, laws, regulations, policies, technologies, etc.) are very important. As contextual drivers get stronger (whether supportive or opposing), we may expect attitude to become less significant in influencing behaviour. We need to find ways to address both attitude and context in concert in order to create synergies supporting effective mitigation at higher cost and inconvenience.

7. Social marketing approaches, which drive behaviour change by targeting audiences with tools designed to overcome specific barriers and engage social networks, are proving popular for promoting sustainability. However, some practitioners question whether applying "value-neutral" social marketing in its current form to climate change may actually reinforce segmentation and individualism rather than helping to identify common ground, build social capital, shift values and promote environmental citizenship.

8. The journey from individual change to system change can seem both daunting and exciting. New theories and practical methods, including Theory U, are emerging to encourage active collaboration across civil society, business and government to help transform our political, economic, environmental and social systems.

Perhaps we have two challenges before us. The first challenge is to adapt what we can learn from existing research and experience to New Zealand's current context in order to engage individuals more effectively in mitigation. The second challenge is to take on board the suggestion of Otto Scharmer and open up to both learning and leading from the emerging future. What does the future want to tell us about the behaviour of New Zealanders in a successful economy with low or zero net emissions? And what were the steps that got us there from here?

1. Introduction

Ultimately, the collective impact of individuals' behaviour drives anthropogenic climate change, and in the hands of individuals lie the solutions to stabilising emissions. The best technologies and policies in the world are meaningless if no one chooses to use them. Although the scientific and economic case for significant mitigation is growing, our social attitudes and practices are not responding in kind. At the level of individuals, we commonly observe two key disconnects: between facts and beliefs on climate change, and between beliefs on climate change and actions to reduce emissions. These disconnects are driven by a range of factors: personal, social, economic and structural. Achieving congruence between facts, beliefs and actions on climate change across a critical mass of people presents no small challenge.

This paper explores insights from the fields of human psychology and social science on what drives behaviour with positive environmental outcomes, and how we might seek to overcome behavioural barriers that lie between incremental change and transformational change to reduce emissions. Why do some people fail to take mitigation actions that should clearly be in their personal interest? How can we satisfy, redefine or transcend personal interest so that more people choose to take mitigation actions that are clearly in the present or future interest of the global commons?

The paper starts by examining some of the **psychological factors** that block acceptance of information about climate change and the assumption of the personal responsibility to act. It then discusses some of the **behavioural models** that have been developed by social scientists to explore the process of decision making with environmental outcomes. It concludes by highlighting some **applied approaches to behaviour change** that can be integrated into the development of climate change policy and programmes by governments, businesses and NGOs.

2. Insights from psychology

A growing body of literature from the field of psychology explores behavioural responses to climate change and other relevant environmental issues. The Climate Change Task Force of the American Psychological Association (Swim et al. 2009) identified six central questions where psychology can shed light:

1. How do people understand climate change risks?
2. What are the human behavioural contributions to climate change?
3. What are the psychosocial impacts of climate change?
4. How do people adapt to climate change?
5. What are the psychological barriers to climate change action?
6. How can psychologists assist in limiting climate change?

This paper focuses on the fifth question – what are the psychological barriers to climate change action? – while recognising that it is influenced by the others.

Robert Gifford at the University of Victoria (Canada) provides an insightful assessment of a range of psychological barriers to both mitigation and adaptation. He creatively refers to them as the "dragons of inaction" and organises them into seven genera and 29 species (Gifford 2011). This assessment is summarised in Table 1. While the categorisation is Gifford's, each of the barriers and manifestations he names is supported by cited literature. Three of these are discussed in more detail below: adherence to ideologies/world views, comparison to social norms and networks, and the role of emotion around perceived risks.

Many studies have examined the influence of **ideologies/world views** in driving personal beliefs about anthropogenic climate change and personal decisions to act. This "dragon" can significantly impact on people's ability to accept and act upon factual information that conflicts with their ideologies. Trying to reconcile conflicting information, beliefs and behaviours, especially those relevant to one's core identity, can cause discomfort, sometimes referred to as "cognitive dissonance". People seeking relief from this discomfort can choose to change their beliefs and/or behaviours, or reject the information. The latter can be the easiest choice.

This is one reason why intentional climate change misinformation campaigns led by interest groups (e.g. see Oreskes and Conway 2010) have had such a powerful and long-lived effect. In contrast to ignorance, reliance on misinformation can lead people to adopt strong convictions that are difficult to overturn. Studies involving many social issues (e.g. beliefs on politicians, health, other environmental issues, etc.) have demonstrated the difficulty of correcting misinformation, particularly when the correction conflicts with existing ideologies or mental models, when high-profile or emotive issues are involved, or when people react negatively to being told what to think by an "authority". Attempts to correct misinformation can cause a "boomerang effect" (also referred to as "backfiring"), which pushes people to adhere even more closely to the wrong information that aligns with their ideology. This can end up reinforcing polarisation (e.g. see Nyhan and Reifler 2010, and Hart and Nisbet 2011).

Research suggests the need to distinguish between the effectiveness of perceived knowledge versus actual knowledge in overriding ideological convictions. A US study by Leiserowitz et al. (2011) found that people who most strongly rejected climate change on scientific grounds also believed they were best informed about that topic. However, an Australian study by Guy et al. (2014) tested the distinction between general scientific knowledge and specific knowledge about climate change with regard to the impact of ideology on climate change beliefs. They found that ideology had less influence on the climate change beliefs of individualists when they had greater knowledge of specific climate change causes than when they had only general scientific knowledge. This reinforces the importance of public education specifically about climate change.

One approach for overcoming ideological barriers to receiving information is to frame messages and corrections in terms that are consistent with the prevalent ideologies or world views in the target group (Lewandowsky et al. 2012). However, this approach can be limited when information fundamentally contradicts strongly held ideologies or when messaging designed to appeal to one group leads to alienating another or creates further barriers. For example, a US study found that

Table 1: Psychological barriers to climate change mitigation and adaptation

General psychological barrier	Specific manifestation	Explanation
Limited cognition	Ancient brain	Our ancestors evolved with a focus on present survival of the immediate group, whereas climate change appears to threaten other people somewhere else and in the future.
	Ignorance	People may be ignorant of climate change as a problem or of what actions to take. This is exacerbated by inaccurate reporting in the media and by the variability of climate change drivers and solutions.
	Environmental numbness	Two dimensions of numbness are keeping a narrow focus on our personal environment and tuning out information that is repeated too often.
	Uncertainty	Actual or perceived uncertainty about climate change impacts and the effectiveness of solutions can trigger people to avoid or postpone action.
	Judgmental discounting	Studies have identified a tendency toward spatial and temporal discounting of environmental risks. "Neutralisation theory", or the rationalising of deviant behaviours to avoid responsibility, could be considered another form of discounting.
	Optimism bias	Studies have identified a tendency for people to assume that environmental impacts will be less damaging – at least to themselves – than predicted; this could be extended to climate change.
	Perceived behavioural control/ self-efficacy	If people believe their individual actions will not affect the outcome, or that a negative outcome is inevitable even with collective action, they may not feel motivated to act.
Ideologies	Worldviews	A worldview strongly grounded in free-enterprise capitalism has been identified as a significant predictor of disbelief in global warming.
	Suprahuman powers	Some people believe that a higher power will either protect them from climate change or impose climate change on them regardless of what they do.
	Technosalvation	Some people believe that technologies for mitigation or geoengineering will be sufficient to solve the problem of climate change.
	System justification	People have a tendency to defend and justify the status quo.
Comparisons with others	Social comparison	People have a tendency to compare themselves with others.
	Social norms and networks	People are strongly influenced by social norms and social networks.
	Perceived inequity	The fear of bearing a disproportionate burden or losing out to free-riders can discourage personal change.

General psychological barrier	Specific manifestation	Explanation
Sunk costs	Financial investments	People are loss averse and want to avoid stranded assets.
	Behavioural momentum	Habits can be very hard to change quickly and permanently.
	Conflicting values, goals and aspirations	Concern about climate change competes with other personal desires such as comfort and status, and other societal priorities for the economy and environment.
Discredence	Mistrust	A lack of trust between and among citizens, scientists and government officials can be an impediment to behaviour change.
	Perceived programme inadequacy	Citizens and businesses may not have confidence in government mitigation programmes.
	Denial	Polls continue to document beliefs by a substantial (and very vocal) minority that climate change is not happening or is not caused by human activity.
	Reactance	Climate change policies can be perceived as government attempts to limit personal freedom.
Perceived risks	Functional	New technologies might not work effectively.
	Physical	Changing to new technologies and practices could involve physical dangers.
	Financial	The payback from mitigation investments may not meet expectations.
	Social	People's social status may be affected by the actions they take on mitigation.
	Psychological	Changing behaviour can have negative impacts on people's self-esteem and self-confidence.
	Temporal	People may not want to spend time on mitigation activities with little or no perceived benefit.
Limited behaviour	Tokenism	People may choose actions that have little impact, particularly if they are easy to take or have a low cost.
	Rebound effect	Gains from mitigation can be reduced or reversed by subsequent actions. For example, people who buy a more fuel-efficient car may choose to drive more.

Source: Adapted from Gifford (2011).

labelling high-efficiency light bulbs as environmentally friendly appealed to political liberals but alienated political conservatives (see Gromet et al. 2013). People who value energy independence may be willing to support climate change action because it reduces reliance on imported fossil fuels, but may subsequently withdraw their support if new affordable domestic fossil fuel resources are developed.

Individuals are strongly affected by **social norms and networks**, and through feedback loops individual actions help to shape social norms over time. The power of social norms and networks has been studied extensively. One example is a Californian study on household energy-efficiency programmes. Providing simple information about a household's energy performance relative to that of its neighbours proved to be an effective motivator for improvement when households were less efficient than average. However, this effect cut both ways: households that learned they were more efficient than average tended to increase their energy use in response unless they were given positive feedback for exceeding average performance (Schultz et al. 2007). When the social norm is to increase emissions, people can more easily rationalise their own inaction; if no one else is doing anything, they might as well join the crowd and enjoy the same benefits as everyone else. This suggests the importance of leadership in modelling positive behaviours as the means of shifting social norms.

The power of social networks can be mobilised creatively to shift energy behaviour. For example, one US programme applied the model of the "Tupperware Party" to household energy-efficiency improvements. The home hosting an "Impact Party" received a free energy assessment in return for inviting a group of five to ten friends to hear a presentation from a field organiser and contractor. If guests chose to host their own party, then they would get the same free services. Local gas and electric utilities provided some funding for retrofits (Isaacson 2013).

Emotions play an important role in how people respond to the risks of climate change, and appealing to emotions has been a core component of campaigns both for and against climate action. In her book *Psychology for a Better World*, Niki Harré (Harré 2011) at the University of Auckland suggests that communicating positive and empowering visions of the future we want to experience may be more effective than relying on messages of impending disaster, fear, shame and guilt. She cites work by Barbara Frederickson showing that negative emotions focus our attention narrowly on responding to the threat, whereas positive emissions broaden our focus and make us more creative and open to possibilities (Fredrickson 2001). Fear can trigger adherence to the status quo rather than encouraging taking on new risks. When people feel overwhelmed by negative emotions and incapable of addressing their cause, it is tempting to escape from those feelings through avoidance, denial, rationalisation, blaming and fatalism. Conversely, when we feel positive, we are more capable of facing problems objectively and identifying solutions.

So far, climate change activist campaigns appealing to fears around future climate impacts have had some effect but have not inspired change at a globally transformational scale. Conversely, we have seen many cases in New Zealand, Australia and the US where opponents of climate change policies have stymied action by appealing to fears that the impact of the proposed policies on today's citizens will be worse than the problem itself and will not solve it. If people perceive a conflict between "personal survival" fears regarding individual well-being in the short term

and "collective survival" fears regarding climate change impacts in the long term, the former can easily take precedence, especially if the latter seem distant and uncertain.

A fascinating study by Smith and Leiserowitz (2013) examined the role of emotion in support for global warming policy in the US. They looked for associations between emotions, affective imagery, values (egalitarian versus individualistic) and sociodemographic factors on policy support for interventions like renewable energy research, tax rebates for efficient cars and solar panels, CO_2 regulations, signing an international treaty to reduce emissions, utility renewable portfolio standards, cap-and-trade, funding for building efficiency and support to developing countries. They reported:

> *This research found discrete emotions alone were able to explain a large proportion of the variance (50%) in public global warming policy support. Further, discrete emotions were the strongest predictors of policy support, even controlling for other factors like holistic affect, imagery, values, sociodemographics, political party and ideology.*
>
> *Worry, in particular, was the single strongest predictor. That is, the more respondents worried about global warming, the more likely they were to support national climate and energy policies. Interestingly, however, fear was not associated with increased policy support in either the emotion block or the full model. Although a positive correlation was found between worry and fear in initial bivariate correlation analyses, the relative impact of fear was "washed out" when combined with other items in both of these models. This finding has significant implications for climate change educators and communicators.*

In addition, the authors found that the positive emotions of interest and hope had a strong association with greater policy support. The importance of these emotions in motivating behaviour has also been observed in studies in other fields.

The authors cite studies suggesting that while fear can trigger disengagement, especially if solutions appear out of reach, worry can trigger "deliberative and iterative decision making". They suggest that "worry appeals" would be more effective than "fear appeals" – if not taken to an extreme. In addition, they cite studies showing that positive emotions can be more persuasive and engaging than negative emotions when people do not perceive themselves as vulnerable. They note a study by Myers et al. (2012) that concluded that framing global warming as a health issue was more likely to inspire hope than framing it around the environment or national security. Note that framing of climate change responses around health benefits may also align with a broad range of ideologies and world views.

The authors emphasise that their study shows correlation, not causation. An interesting question raised for further research is the relative significance of positive emotions around solutions and negative emotions around impacts in predicting policy support. They conclude:

> *Given the general lack of public involvement with the issue of climate change, combined with the relationship between hope, interest, and policy support found in this investigation, developing communications that increase public interest, inspire hope, and encourage positive feelings when people act in climate-friendly ways may be more effective than fear or guilt appeals. This study also found that many Americans are interested in the issue and hopeful about policies to mitigate the risk. As a consequence, climate change communicators should also consider using "interest appeals" and "hope appeals" to promote constructive engagement with climate change solutions.*

This kind of research demonstrates that we need to think carefully about how we respond to the range of conflicting emotions about climate change. When making the case for transformational action, it is important to demonstrate that people's fears about a loss of well-being can be addressed. To use an analogy, people will not go on a diet if they think they will starve. We also need to find ways to communicate factual information about the negative consequences of our current pathway without triggering people to disengage. Instilling feelings of empowerment, interest, hope, gratitude, love, joy, pride, service and social connection around taking action on solutions, and providing positive feedback on progress, may be more effective than disaster messaging to help motivate people to engage constructively in climate change solutions.

Not only can psychological barriers be very powerful, but they can also be highly variable across the population and across different aspects of mitigating climate change. Researchers have sought to develop systems for segmenting populations so that communications and programmes can be targeted to overcome specific psychological barriers to effective action. One prominent example of segmentation is the "Six Americas" study conducted by researchers at Yale and George Mason universities (Leiserowitz et al. 2013). Starting in 2008, the researchers analysed nationally representative survey data on global warming beliefs, behaviours and policy preferences. They identified six distinct groups with common characteristics, and tracked changes in the survey data over time. Table 2 summarises their prominent characteristics. Recent research from the team has focused on identifying informational needs and strategic approaches to messaging for each group (Roser-Renouf, Stenhouse, et al. 2014).

Table 2: Profile of the Six Americas

Category (April 2013 survey data)	Profile description
Alarmed (16%)	They are "certain global warming is occurring, understand that it is human-caused and harmful, and strongly support societal action to reduce the threat. They discuss the issue more often, seek more information about it, and are more likely to act as global warming opinion leaders than the other segments. They are the most likely of the six groups to have engaged in political activism on the issue, although only about a quarter have done so."
Concerned (26%)	They are "moderately certain that global warming is occurring, harmful and human-caused; they tend to view global warming as a threat to other nations and future generations, but not as a personal threat or a threat to their community. They support societal action on climate change, but are unlikely to have engaged in political activism."
Cautious (25%)	They are "likely to believe that climate change is real, but are not certain, and many are uncertain about the cause. They are less worried than the Concerned, and view global warming as a distant threat. They have given little thought to the issue and are unlikely to have strongly held opinions about what, if anything, should be done."
Disengaged (5%)	They "have given the issue of global warming little to no thought. They have no strongly held beliefs about global warming, know little about it, and do not view it as having any personal relevance. They tend to have the lowest education and income levels of the six groups."
Doubtful (15%)	They are "uncertain whether global warming is occurring or not, but believe that if it is happening, it is attributable to natural causes, not human activities. They tend to be politically conservative and to hold traditional religious views."
Dismissive (13%)	They are "very certain that global warming is not occurring. Many regard the issue as a hoax and are strongly opposed to action to reduce the threat. About one in nine have contacted an elected representative to argue against action on global warming."

Source: Profile descriptions adapted from Leiserowitz et al. (2013). Survey data adapted from Roser-Renouf, Stenhouse, et al. (2014).

A US study by Brulle et al. (2012) provides further insights into the factors that can influence fluctuations in public perceptions of climate change over time. Recent polling by Horizon Research (2012) gives a snapshot of New Zealand views on climate change and how they have changed from 2008 to 2012. The results from both studies are provided in Box 1.

Clearly, the role of psychological factors in influencing climate change beliefs and behaviour is both vitally important and complex. The remainder of this paper examines how the current understanding of these factors has been integrated into models of pro-environmental behaviour change.

Box 1: What shapes broad public concern about climate change?

From 2002 to 2010, polling found that US public concern over the threat of climate change fluctuated considerably, staying fairly steady from 2002 to 2005, rising from 2005 to 2007, dropping sharply in 2008, increasing in 2009 and declining in 2010. Brulle et al. (2012) studied the factors driving this trend. They found that the most significant factor was cues from the Congressional political elite, with demonstration of conflicting, polarised views causing fluctuations in public concern. The effects of media coverage/advocacy were significant but relatively short-lived. Economic shocks and war intensification lowered public concern about climate change, while the price of oil was not a significant driver. Extreme weather events and public access to accurate scientific information were not significant factors. The authors concluded that mass communications efforts are likely to be ineffective unless they are sustained and linked to a broader political strategy. It will be interesting to see if growing personal experience with extreme weather events will become a more significant driver of climate change concern in the future.

Similarly, polling in New Zealand suggests fluctuating public concern about climate change and segmentation along political lines. Horizon Research (2012) found that in 2012 52.4 percent of New Zealanders perceived climate change as an urgent or immediate problem, compared to 75.4 percent in 2008. Between 2008 and 2012, the number of people saying that climate change was not a problem increased from 13 percent to 19 percent. There was a clear split along political lines. In 2012, a substantial block of supporters of the Act (44.6 percent) and Conservative (52.6 percent) parties felt that climate change was not really a problem. Among National supporters, 29 percent felt that climate change was not really a problem, 18 percent felt that climate change is a problem for the future, and 41.3 percent felt climate change is an urgent or immediate problem. In contrast, supporters of the Green (78.3 percent), Maori (77.2 percent), Mana (64.7 percent), Labour (60.3 percent) and New Zealand First (47.1 percent) parties felt that climate change was either an urgent or immediate problem. However, while 53.4 percent of respondents felt that global warming policy should have a high or very high priority, larger percentages still felt that New Zealand's government (Parliament (64.4 percent), prime minister (60.6 percent), and officials (62.9 percent)), businesses (67.5 percent) and citizens (63.7 percent) should be doing more to address global warming, and 74.2 percent felt that other countries should be doing more.

These studies raise an interesting "chicken and egg" question: when and how do political platforms *drive* versus *mirror* popular beliefs about climate change and the need for effective domestic action?

3. Models for behaviour with pro-environmental outcomes

Social scientists have proposed a range of models for deconstructing the complex drivers of pro-environmental behaviour. These models select and arrange different building blocks of behavioural responses, enabling social scientists to study which have the greatest influence in different situations. Modellers emphasise that such models are not predictors of individual behaviour and are designed for specific contexts rather than broad application.

Drawing from the "ABC" conceptual model developed by Guagnano et al. (1995), as cited by Stern (2000), we can think of behaviour (B) as a function of personal attitude (A) and context (C). Attitude (an expression of feelings) is influenced by many factors. Stern (2000) focuses on values, beliefs and personal norms as attitudinal drivers of pro-environmental behaviour. Many types of more structural factors determine the context for decision making. After examining some of the common building blocks in behaviour models, this paper will provide a few examples of how they are integrated in different models.

3.1. Types of behaviour

Many types of behaviour can impact on the environment, either directly or indirectly and either with intention or as a consequence of achieving non-environmental objectives. Stern (2000) proposes four useful categories of environmentally significant behaviour across the personal, public and organisational spheres:

1. **Environmental activism** is committed action in the public sphere, such as being an active member of environmental organisations or attending protests.
2. **Non-activist behaviour in the public sphere** includes actions related to environmental citizenship (e.g. voting, signing petitions or contributing to environmental organisations) and support for public policies.
3. **Private-sphere environmentalism** covers consumer impacts from the purchase, use and maintenance of goods and services and the management of waste.
4. **Other environmentally significant behaviour** relates primarily to how individuals influence organisational action.

People's actions taken as individual actors versus political or organisational actors can vary according to their motivation, their perceived effectiveness and the scale of their potential impact. Importantly, people can act cooperatively and support collective changes that they may not be willing to make – or pay for – voluntarily on their own. This willingness for individuals to cooperate with others at personal cost is explored by behavioural economists (for discussion, refer to Ormsby and Kerr (2014)). Individuals who engage in political and organisational action may have a far broader environmental impact than those who choose to modify their daily choices as household consumers, but may feel less direct control over, confidence in and personal satisfaction from their efforts. Individuals may also take pro-environmental actions with non-environmental intentions (e.g. cost savings, convenience, performance, self-sufficiency, personal identity and social status).

To be effective, pro-environmental behaviour should have a significant collective impact and be sustained. As noted by Gifford (2011), the "dragons" of perceived inequity and inadequacy of individual effort, old habits, rebound effects and tokenism can reduce the long-term effectiveness of pro-environmental behaviour.

3.2. Drivers of attitude

3.2.1. Values

Many studies have shown strong correlations between dominant human values and attitudes and behaviour regarding climate change. In this paper, the term "values" refers to broad-based, stable dispositions that are central elements of personality and belief structures (Stern 2000; Darnton 2008). A theory of basic human values advanced by Shalom Schwartz (see Schwartz and Boehnke 2004) identified 10 distinct values operating along a motivational continuum and interacting with one another, sometimes in conflict. These values can be organised into four categories that can be paired in opposition: **openness to change** versus **conservation**, and **self-transcendence** versus **self-enhancement**. It can be useful to think about how people whose dominant values relate to openness to change and self-transcendence would respond to different types of climate change messaging relative to those more strongly oriented toward conservation and self-enhancement. It is also easy to see how different political platforms are designed appeal to different values along the continuum.

In his Values Beliefs Norms (VBN) theory, Stern (2000) places values at the top of the causal chain for attitudes driving non-activist, pro-environmental behaviour. His model focuses on three types of values: **egoistic**, **altruistic** (or "social orientation") and **biospheric**. These values are explained elegantly by Kollmuss and Agyeman (2002) as follows:

> *The social orientation is concerned with the removal of suffering of other people, the egoistic orientation is concerned with the removal of suffering and harm from oneself, and the biospheric orientation is concerned with the removal of destruction and suffering in the non-human world. Every person has all three orientations but in different strengths.*

In their Theoretical Social-Cognitive Model of Political Activism for Climate Change Mitigation, Roser-Renouf, Maibach, et al. (2014) place the core values of **egalitarianism** versus **individualism** at the root of activist behaviour. Egalitarians focus on the threat of climate change to the health and safety of others, while individualists are more concerned about the threat of government policy to personal freedoms. The Six Americas study cited earlier demonstrates linkages between global warming beliefs and identification with egalitarian versus individualistic values (Roser-Renouf, Stenhouse, et al. 2014).

Values can be influenced by an individual's "microsystem" (immediate social net), "exosystem" (media and political organisations) and "macrosystem" (the broader cultural context) (Kollmuss and Agyeman 2002). An interesting question in designing climate change programmes is striking the appropriate balance between appealing to current dominant values and attempting to shift values. In a US conference presentation, Katie Ruiz at E Source (Ruiz 2013) compared the outcomes

of household energy efficiency and renewable energy campaigns in two US towns with contrasting dominant political values: Boulder, Colorado (very liberal), and New Berlin, Pennsylvania (very conservative). Both campaigns were successful because they were customised to appeal to the local values. "Liberal" values included saving the environment, reducing the impacts of global climate change, and protecting future generations. "Conservative" values included creating jobs, reducing dependence on foreign oil and increasing freedom. "Bipartisan" values included saving money, increasing comfort for your family and reducing waste. In that case, different values were triggered to produce positive environmental outcomes.

However, a study by Evans et al. (2013) found that when environmental programmes were marketed toward self-transcending values, they could generate a positive spill-over effect, increasing environmental actions in other areas. In contrast, when environmental programmes were marketed toward self-interest values (e.g. cost savings), they did not generate environmental spill-over effects. This and other studies suggest that shifting values over time toward self-transcendence could have broader benefits.

3.2.2. Beliefs

Building on core values, personal beliefs about climate change are important drivers of behavioural responses. In this context, it is useful to group climate change beliefs into two broad categories: beliefs about **climate change outcomes**, and beliefs about the **efficacy of solutions**. In their activist model discussed above, Roser-Renouf, Maibach, et al. (2014) draw upon four central beliefs identified by Krosnick et al. (2006) as predictors of whether people perceive global warming as a serious national issue:

Outcomes	Global warming is occurring.
	Global warming will have negative consequences.
Efficacy	Humans are causing the problem.
	Humans can reduce the threat.

International polling shows that the general population remains fragmented along this sequence of beliefs. It can take a lot of public education and effective communication to help move populations through the full sequence. Campaigns aimed at blocking action on climate change have targeted different stages in the sequence.

Even when individuals have accepted that climate change is real and serious at a global level, they may not perceive it as a **personal risk** (affecting themselves or something they value), and this can reduce their willingness to act. Researchers have studied how "psychological distance" from climate change affects people's beliefs. Milfont et al. (2014) noted four dimensions of psychological distance: likelihood distance, geographical distance, temporal distance and social distance. The international literature suggests that greater psychological distance has a negative effect on climate change concern and willingness to act. Using data from the New Zealand Attitudes and Values Study, Milfont et al. found that "proximity to the coast

was associated with increased belief that climate change is real and increased support for government regulation of carbon emissions, irrespective of regional differences in affluence, residencies' average height above sea level, and individual differences in sex, age, education, political orientation and wealth". This effect could be measured at 10km increments from the coast. This study shows an association only, not causation.

Even when individuals have accepted that climate change is real and serious, and that humans are responsible and can do something about it, they may still not be prepared to take action themselves unless they believe in their **personal efficacy**. For example, individuals may not believe that their actions – whether as activists, voters, consumers or organisational participants – can make a real difference, particularly in the absence of collective action. They may not believe that mitigation represents an effective personal investment, particularly if they bear significant up-front costs and much of the return will accrue to future generations in other countries. A study of college students found that "those who believe technology and growth will solve environmental problems were less likely to make personal sacrifices" (Gigliotti 1992, 1994, as cited in Kollmuss and Agyeman 2002). Media messaging around efficacy can play a role in public perceptions. A recent study on coverage of climate change by US television news broadcasts (Hart and Feldman 2014) reported:

> *Results show that while impacts and actions are discussed independently in a majority of broadcasts, they are rarely discussed in the same broadcast. Moreover, while news coverage frequently conveys the threat of climate change, it provides an inconsistent efficacy message, often including both positive and negative efficacy cues. Finally, impacts are framed primarily in terms of environmental consequences, whereas actions are framed in terms of political conflict.*

Finding ways to shift beliefs around personal efficacy will be key to mobilising effective action on climate change.

Of course, non-environmental beliefs can also determine how people respond to climate change. These could include beliefs about the roles of governments and markets, economic growth, the costs and effectiveness of new technologies and market-based instruments, the rule of law, human ethics and the obligations of individuals within society, etc.

3.2.3. Norms

Norms are models or patterns for behaviour. A useful distinction can be made between personal norms and social norms. Drawing from the work of Shalom Schwartz, Darnton (2008) describes this distinction as follows:

> *Personal norms are defined as feelings of moral obligation to act, which are free from social expectations… The key distinction between personal and social norms is that the influence of social norms is seen to be dependent on external sanctions, whereas the only sanctions applying to personal norms are internalised, measured in terms of discrepancy with an individual's self concept (ie. his sense of self). Guilt is one emotion that could arise from such a discrepancy. Personal norms are found to be better predictors of altruistic behaviours than social norms; they have also been found to be more effective at predicting a range of pro-environmental behaviours*

(Thøgersen 2007), although distinguishing between these two closely-related factors in research experiments is clearly challenging.

In this context, personal norms determine when one feels a personal obligation or responsibility to act, whereas social norms provide a reference point for comparison of one's behaviour with that of others. Norms play an important role in many behavioural models. Through feedback loops between norms, behaviours and outcomes, both personal and social norms can change over time.

3.3. Contextual drivers

Whether attitudes about climate change translate into personal action can depend heavily on the context in which individuals are making decisions. Contextual drivers can be both personal and external. Stern (2000) discusses two types of personal contextual drivers for environmentally significant behaviour. The first is personal capabilities (e.g. literacy, social status, financial resources, and behaviour-specific knowledge and skills). The second is personal habit and routine. Habit is a powerful driver of behaviour – and one that is very hard to change permanently. Stern also identifies the following external contextual factors: material costs and rewards, laws and regulations, available technology, social norms and expectations, supportive policies and advertising.

Contextual barriers can impact on whether people have the capacity and means to take action. In the case of curbside recycling, Guagnano et al. (1995) found that the attitude/behaviour association is strong when the context is neutral, and approaches zero when contextual factors are strongly supportive or opposing. Diekmann and Preisendörfer (1992), as cited in Kollmuss and Agyeman (2002), found a strong correlation between environmental attitudes and low-cost pro-environmental behaviours, but not behaviours that are higher cost.

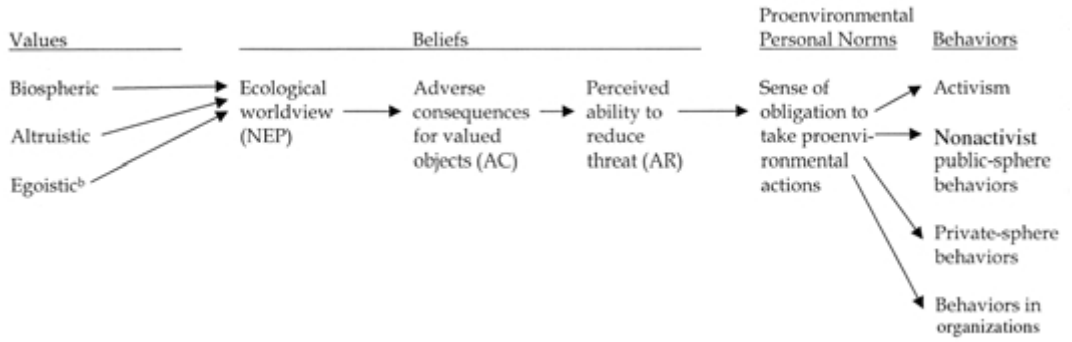
3.4. Behavioural models

A series of behavioural models have been developed and tested by social scientists in different contexts to improve our understanding of environmental behaviour. An early model from the 1970s is referred to as the Information Deficit model. This linear model assumed that environmental knowledge would influence environmental attitudes, leading to pro-environmental behaviour. This type of model has been proven wrong, but its impact is still evident in climate change campaigns (Kollmuss and Agyeman 2002). Darnton (2008) provides a useful survey of models, showing their evolution. This paper highlights three examples that appear relevant to climate change behaviour. These are provided in an effort to illustrate different approaches to integrating the factors detailed above. Further analysis of these models and the studies that have applied them is beyond the scope of this paper.

3.4.1. Values Beliefs Norms (VBN) Theory

The Values Beliefs Norms (VBN) Theory, advanced by Stern (2000), states that pro-environmental behaviour is driven most immediately by personal norms. These are influenced by beliefs, which in turn are influenced by values. This model focuses on attitudes and does not address contextual factors. See Figure 1.

Figure 1: Values Beliefs Norms Theory



Source: Stern (2000). Copyright 2000 by the Society for the Psychological Study of Social Issues. Reprinted with permission from John Wiley & Sons.

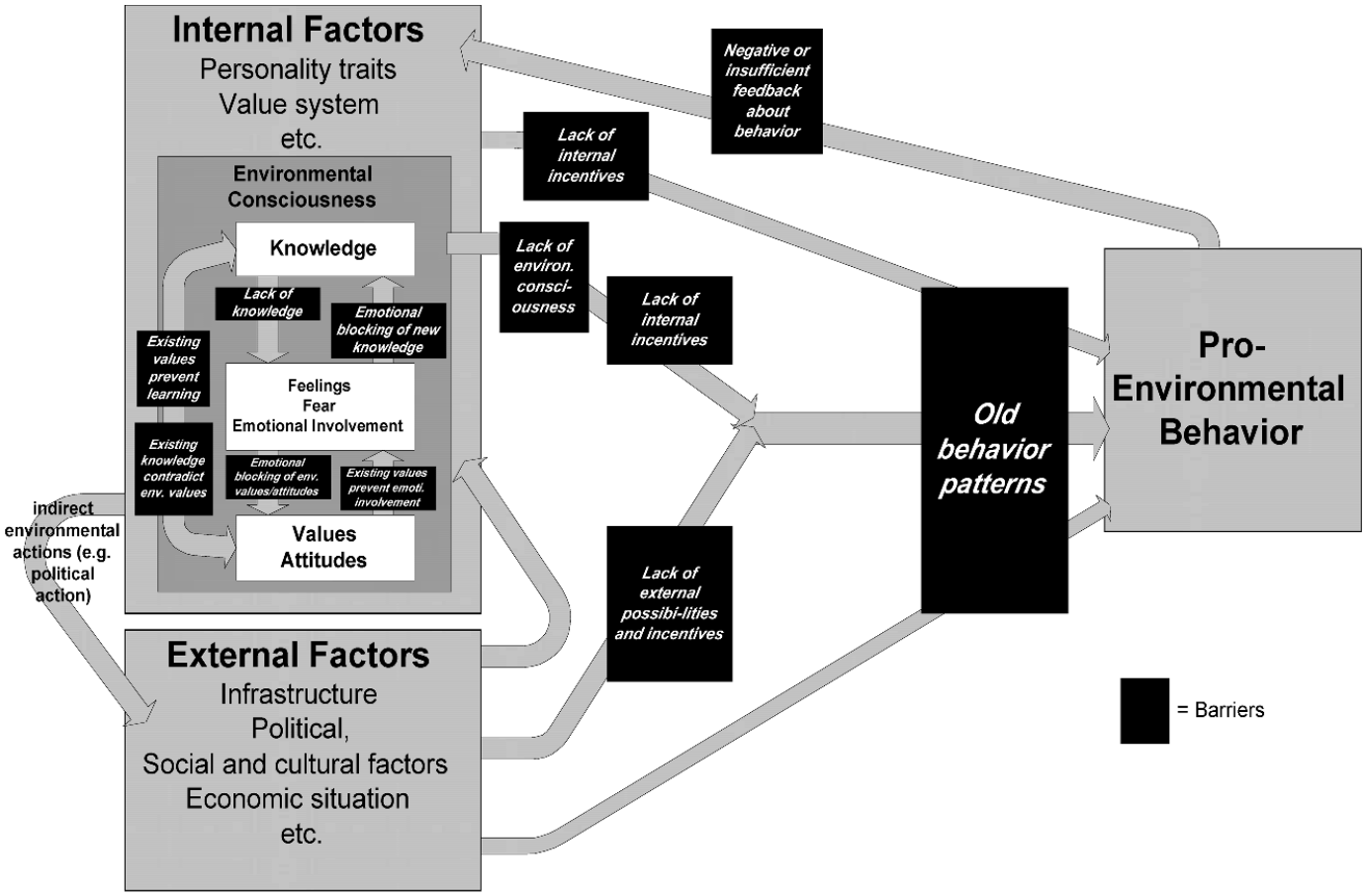
3.4.2. Needs Opportunities Abilities (NOA)

The Needs Opportunities Abilities (NOA) model identifies three drivers of behaviour which interact to produce a given outcome. Needs and opportunities together determine one's "motivation to perform" an activity (MP). Opportunities and abilities together determine one's "behavioural control" (BC). The combination of motivation and behavioural control produce the behaviour (Steg and Vlek 2009).

3.4.3. Model of Pro-Environmental Behaviour

The Model of Pro-Environmental Behaviour was advanced by Kollmuss and Agyeman (2002). This model integrates both internal and external factors, and identifies potential barriers (in black boxes) along each pathway. The narrow, outer arrows leading toward behaviour are intended to represent environmental actions that are taken for non-environmental reasons (both internal and external). The large arrow in the middle represents the high significance of the synergistic impact of internal and external factors. There are several internal feedback loops. See Figure 2.

Figure 2: Model of Pro-Environmental Behaviour



Sources: Kollmuss and Agyeman (2002). Reprinted with author's permission.

4. Applied approaches to behaviour change

With a better understanding of drivers for individual behaviour change, we can start to think about moving from individual-level change to system- or society-level change. Change theory is a complex field in itself. Darnton (2008) provides a useful overview that addresses changing habits, change in stages, change via social networks, change as learning and change in systems. As a practical starting point, Stern (2000) offers a series of helpful principles for designing behaviour-change interventions. These include:

A. Use multiple intervention types to address the factors limiting behavior change
   1. *Limiting factors are numerous (e.g. technology, attitudes, knowledge, money, convenience, trust)*
   2. *Limiting factors vary with actor and situation, and over time*
   3. *Limiting factors affect each other*

B. Understand the situation from the actor's perspective

C. *When limiting factors are psychological, apply understanding of human choice processes*
    1. *Get the actors' attention; make limited cognitive demands*
    2. *Apply principles of community management (credibility, commitment, face-to-face communication, etc.)*
D. *Address conditions beyond the individual that constrain proenvironmental choice*
E. *Set realistic expectations about outcomes*
F. *Continually monitor responses and adjust programs accordingly*
G. *Stay within the bounds of actors' tolerance for intervention*
H. *Use participatory methods of decision making.*

The remainder of this section focuses on two very different approaches to behaviour change at a large scale: community-based social marketing and Theory U.

4.1. Community-based social marketing

Social marketing applies practices from commercial marketing to social change, seeking to move people from their current starting point toward a goal rather than transforming the underlying system (Darnton 2008). Community-based social marketing (CBSM) is a framework developed by Doug McKenzie-Mohr, a Canadian environmental psychologist, as an alternative to information-based sustainability campaigns (McKenzie-Mohr (2000)). CBSM has four basic steps (McKenzie-Mohr (no date)):

1. *Identifying the barriers and benefits to an activity,*
2. *Developing a strategy that utilizes "tools" that have been shown to be effective in changing behaviour,*
3. *Piloting the strategy, and*
4. *Evaluating the strategy once it has been implemented across a community.*

This approach emphasises the value of up-front research to understand the target audience and identify and prioritise behaviour-specific barriers, piloting a programme before full-scale implementation, and ongoing evaluation and improvement. Once the information foundation has been developed, a series of behaviour-change tools can be applied at the community level (see Table 3). Integration of tools is encouraged, and their implementation must be made convenient for participants.

CBSM principles and methods are flexible, have an appealing focus on concrete behaviour change, and employ the power of positive incentives, social norms and networks. They have become popular and have generated successful outcomes. The CBSM website (www.cbsm.com) lists numerous case studies illustrating their application across sectors and countries.

However, Corner and Randall (2011) offer an interesting critique of relying on social marketing (in a broader sense than CBSM alone) to address climate change mitigation.

Table 3: CBSM tools of behaviour change

Tools of behaviour change	Recommendations
Commitment	Emphasise written over verbal commitments. Ask for public commitments. Seek commitments in groups. Actively involve the person. Use existing points of contact to obtain commitments. Help people to view themselves as environmentally concerned. Don't use coercion.
Prompts	Make the prompt noticeable. Make the prompt self-explanatory. Present the prompt in close proximity to the action. Use prompts to encourage people to engage in positive behaviours.
Norms	Make the norms visible. Use personal contact to reinforce norms.
Communication	Use captivating information. Know your audience. Use a credible source. Frame your message. Carefully consider threatening messages; pair them with empowering information. Decide on a one-sided versus a two-sided message. Make your message easy to remember. Provide personal or community goals. Emphasise personal contact. Provide feedback.
Incentives	Closely pair the incentive and the behaviour. Use incentives to reward positive behaviour. Make the incentive visible. Be cautious about removing incentives. Prepare for people's attempts to avoid the incentives. Carefully consider the size of the incentive. Use non-monetary incentives.

Source: Adapted from McKenzie-Mohr (no date).

Their study identifies several limitations related to the narrow, "value-neutral" focus on achieving specific short-term behavioural outcomes by individuals. For example:

1. By tailoring messages to the target audience, social marketing may reinforce beliefs and values – such as those relating to self-interest rather than altruism – that could be counterproductive in the longer term.
2. Social marketing tends to start with easy, low-cost and low-impact behaviours. These may not have a positive spill-over effect for larger changes, and in fact could have a negative spill-over effect.
3. Audience segmentation can reinforce individual differences.
4. The focus on individualism can hinder evolution of new norms for collective problem-solving.

The authors identify the following alternatives that can go beyond shaping behaviours to shaping identity: value-based campaigns and deep framing, engaging through existing social networks and building social capital, and promoting environmental education and environmental citizenship. Drawing from the work of Dobson (2010), they write:

> *In a recent review of the available evidence on environmental citizenship and pro-environmental behaviour, Dobson (2010) argued that if a sense of environmental citizenship can be fostered in individuals and communities, then their pro-environmental behaviour will be rooted in a commitment to the principles and values underlying it, rather than to financial or other types of external stimuli. This is a very different conceptualisation of the challenge of promoting pro-environmental behaviour to the social marketing philosophy of achieving piecemeal behaviour change using any method that 'works'. But interestingly, although fostering environmental citizenship involves predicating specific behaviours on underlying values and principles, it is not necessarily 'the environment' that motivates environmental citizenship. Rather, it is a sense of fairness and justice between humans (requiring a commitment to conserving and protecting environmental resources) that plays the most important role.*

The authors conclude that to achieve large-scale transformational change, social marketing will need to become more rooted in social values and environmental citizenship.

4.2. Theory U

Theory U was developed by Otto Scharmer, building on the work of Peter Senge and other collaborators affiliated with the Massachusetts Institute of Technology's Center for Organisational Learning (Scharmer and Kaufer 2013). Scharmer and Kaufer (2013) offer a framework for transforming global systems to repair a series of disconnections that threaten global sustainable development. The eight key disconnections are between the financial and real economy, the infinite growth imperative and finite resources of planet Earth, the haves and the have nots, institutional leadership and people, GDP and well-being, governance and the voiceless, actual ownership forms and the best societal use of property, and technology and real societal needs. He evaluates how these disconnections can be exacerbated or mitigated by four stages of evolution for economic thought:

1.0: The state-centric model, characterized by coordination through hierarchy and control in a single-sector society

2.0: The free-market model, characterized by the rise of a second (private) sector and coordinated through the mechanisms of market and competition

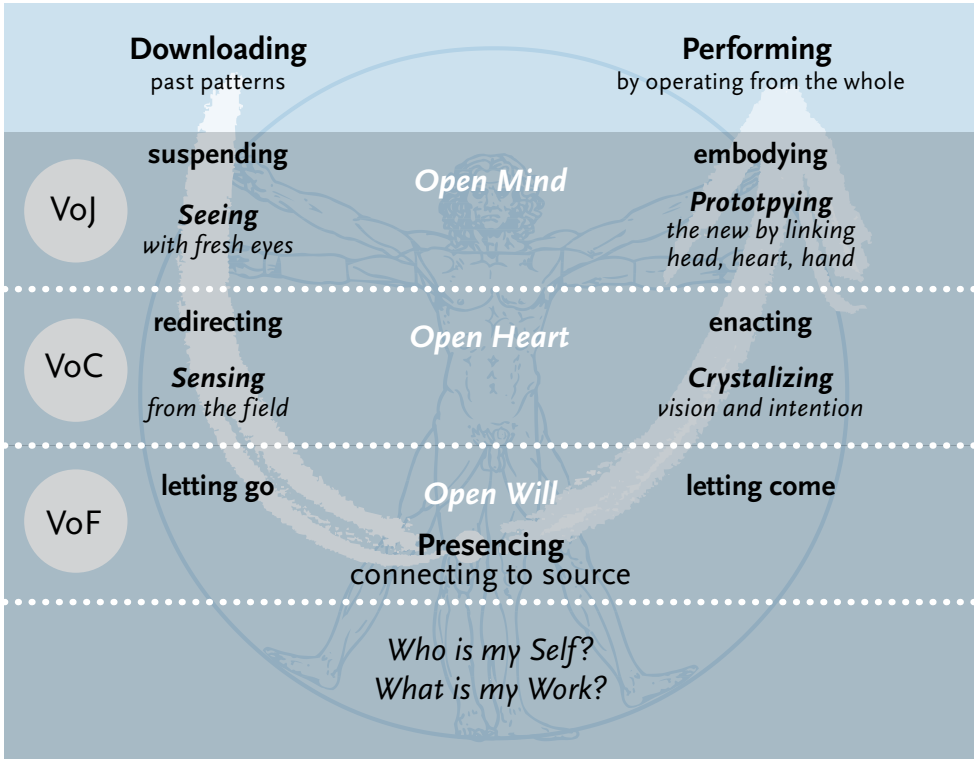
3.0: The social-market model, characterized by the rise of a third (NGO) sector and by negotiated coordination among organized interest groups

4.0: The co-creative ecosystem model, characterized by the rise of a fourth sector that creates platforms and holds space for cross-sector innovation that engages stakeholders from all sectors.

According to Scharmer and Kaufer (2013), repairing the disconnections identified above requires a change in the awareness from which we operate, and a shift away

from learning from the past toward learning and leading from the emerging future. The process of transformation happens through "presencing", defined as "sensing and actualizing one's highest future possibility – acting from the presence of what is wanting to emerge". They identify three dimensions to the journey: relating better to others, relating better to the whole system and relating better to oneself. The journey takes the shape of a U (see Figure 3). Passing down the left side involves a process of observation, suspending, redirecting and letting go. The bottom of the U involves a process of deep reflection, allowing inner knowing to emerge. Passing up the right side involves a process of action, letting come, enacting and embodying through prototyping. Individual behaviour change occurs alongside, and integrated with, system change. Theory U has been applied in different types of systems (e.g. government, corporate, NGO and educational) to co-create innovation. It is a relatively new theory, and it will be interesting to watch how its application evolves in the future, and how the kind of systemic transformation it seeks to achieve will affect people's response to climate change mitigation.

Figure 3: The U Process of Co-Sensing and Co-Creating: Presencing



VoJ = Voice of judgment. VoC = Voice of cynicism. VoF = Voice of fear. See www.ottoscharmer.com. Source: Scharmer and Kaufer (2013).

5. Conclusion

The assessment above suggests that when designing and communicating programmes and policies to shift individual behaviour on climate change mitigation, we should reflect carefully on the following types of questions:

1. In the New Zealand context, which individual behaviours are the most important to shift in order to make an effective contribution to climate change mitigation?
2. How can we communicate the seriousness of climate change and the urgent need for action in ways that trigger personal engagement on solutions?
3. How well do people actually need to understand climate change causes and outcomes and mitigation efficiency – at the macro level and personal level – in order to make effective personal choices about solutions?
4. What framing of climate change issues (e.g. environmental, economic, security, social, cultural, ethical, health, spiritual) can help people with different ideologies/world views to engage? How much should we emphasise non-climate objectives and benefits of effective action to overcome ideological barriers?
5. Where might there be positive or negative spill-over effects between private-sphere actions, environmental citizenship and organisational change? For example, will small, low-cost private-sphere actions merely trigger tokenism and rebound effects, or can they spill over into transforming personal and social norms and support for progressive policies and organisational change?
6. From both short- and long-term perspectives, when is it more effective to appeal to self-interest values versus altruistic or biospheric values? For example, could appealing to self-interest by emphasising cost savings lead to support for, or opposition to, other mitigation actions at a higher cost?
7. Is it more effective to segment programmes to cater to individuals, or to seek ways to build common ground and bring people together to shape social norms and build environmental citizenship?
8. How can we address both attitudinal and contextual barriers in concert to change behaviour?
9. How can we think usefully about stages of behaviour change across the private, public and organisational spheres?
10. How can individual behaviour change help to drive system transformation over time?

Perhaps we have two challenges before us. The first challenge is to adapt what we can learn from existing research and experience to New Zealand's current context in order to engage individuals more effectively in mitigation. The second challenge is to take on board the suggestion of Otto Scharmer and open up to both learning and leading from the emerging future. What does the future want to tell us about the behaviour of New Zealanders in a successful economy with low or zero net emissions? And what were the steps that got us there from here?

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