Community Solar Gardens

A Behavioural Economics Perspective

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consumer-centric solutions for energy

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Abbreviations

Acronym	Definition
BAU	Business As Usual
EOI	Expression of Interest
ISF	Institute for Sustainable Futures
RCT	Randomized Controlled Trial

1 Introduction

1.1 Background

Concentric.Energy is a specialist research consultancy that provides behavioural insights for government and business. Its core business focus is on sustainable resource consumption and resource management –minimizing public/organisational waste and inefficiency, improving the management of natural and human resources, reducing overuse and depletion of communal resources, and encouraging more sustainable practices, e.g., boosting acceptance and uptake of renewables and new energy technologies; helping customers more effectively respond to new modes of energy pricing; increasing energy efficiency and shifting peak demand. The Principal Directors of Concentric.Energy, Dr Karen Stenner and Dr Mark Fischle, each combine a deep understanding of *human psychology* with advanced skills in *quantitative methodology*: an unusual blend of talents for the energy industry that adds significant value to their clients' projects.

1.2 Purpose

The Community Power Agency and the Institute for Sustainable Futures asked Concentric.Energy to provide behavioural insights and expertise that contributes to the success of the Social Access Solar Gardens project. We took up a number of opportunities to deploy our unique skills and expertise to that end, working in close collaboration with both project leadership and prototype teams. This report discusses the various ways in which we provided and/or applied relevant behavioural insights throughout the project, significantly enhancing the value of the work.

1.3 Outline

In outline, this report will proceed as follows:

In the following **Section 2**, we will first set out in general terms some key principles of behavioural economics, including the 'predictable irrationality' (Ariely 2009) of human decision-making. We discuss how these things are relevant to the Solar Gardens concept and project, including likely motivations for/barriers to success, and implications for the design and conduct of related market research.

Section 3 identifies how key principles of behavioural economics were applied in this project.

Section 4 concludes with a set of recommendations designed to maximize the prospects of these kinds of customer-facing energy projects successfully achieving their principal objectives.

2 Behavioural economics

2.1 Overview

Behavioural economics draws on insights from social and cognitive psychology to explain how, when and why human decision-making deviates from a simple, rational assessment of the costs and benefits of alternative courses of action. These deviations are regularly observed in human decision-making across diverse domains and will regularly thwart plans and projects premised on a 'classic' economic understanding (where consumers are assumed to simply weigh up the objective costs and benefits of alternative courses of action). It is by no means assured, for example, that energy consumers will take up a solar gardens offer simply because it is objectively in their own material interests to do so.

Importantly, behavioural economics shows how people's "predictable irrationality" – those commonly observed decision-making biases and heuristics – can create either barriers to achieving, or tools for securing desired behaviour change. Once we understand their prevalence and impact, we can actually utilise these known peculiarities in human decision-making to our advantage, e.g., turning things like aversion to risk and complexity, status quo bias, and the influence of social norms, in our favour.

We will first provide an overview of some of these key decision-making biases and heuristics identified in behavioural economics. Then more specifically in regard to the solar gardens project, we show how behavioural economics helps us grasp consumers' divergent motivations for taking up an offer, the likely impact of different kinds of consumer appeals (whether varying in terms of message content, visual presentation and/or mode of distribution), as well as the best means of actually testing the efficacy of alternative marketing materials.

2.1.1 SOME PECULIARITIES OF HUMAN DECISION-MAKING

There is a wealth of empirical evidence in behavioural economics showing that human decision-making often diverges from the 'rational choice', utility-maximizing assumptions of traditional economic models. Of greatest relevance to the current Solar Gardens product, there is compelling scientific evidence[1] (typically drawn from Randomised Controlled Trials) indicating that humans have a tendency to:

- Employ 'cognitive heuristics' over exhaustive evaluation of all relevant information, using only as much effort as required to 'satisfice' rather than 'optimize', i.e, to arrive at satisfactory, rather than optimal outcomes ("good enough" rather than "best")

[1] For a comprehensive review of the evidence from behavioural economics, see Kahneman (2011).

- Avoid / be repelled by complexity, being less likely to take in content, to make a good decision, or to make a decision at all, as the amount, complexity and/or density of information increases
- Adopt increasingly *simple* decision rules as the environment becomes more complex, considering a *decreasing* number of options, reverting to the default setting or status quo, and deferring or avoiding decisions altogether.
- Neglect opportunity costs, under-weighting the value (lost benefit) of the alternatives foregone (even more so when losses involve time, rather than money)
- Follow the behaviour of others in like circumstances (especially, the social norms of their immediate environment), often without conscious awareness
- Be unduly influenced by the framing of messages/motivations, as well as their visual/graphic presentation.

2.1.2 SIMPLICITY & SATISFICING

Above all else, we reiterate this remarkably consistent finding: that **human decision-making actually deteriorates, or is avoided altogether, the more information and choices are provided**. Arguably, this **need for simplicity** is the most critical factor influencing human decision-making, across domains. As we see above, our demand for simplicity, and desire to reduce complexity and risk, underlies many of our decision-making biases and shortcuts. For example, in regard to the oft-noted[2] power of social norms, people often simply follow the behaviour of others in part because it is an efficient means of quickly making a choice without processing reams of information. Across domains, in a wide variety of situations, social norms (which indicate what similar others are doing in like circumstances) frequently serve as a cognitive shortcut for those trying to decide how to act.

It is clear that people tend to 'satisfice' rather than 'optimize' (Simon 1957), in sharp contrast to the classical assumption—that decision-makers rationally weigh up costs and benefits to arrive at the optimal solution that maximizes their utility. Instead, in the typical environment of complexity and information overload, they strive for a solution that is 'good enough' without necessarily

[2] A growing list of field studies show how social influence cues can alter people's behaviour in the direction of more environmentally friendly outcomes. For instance, a much-cited field experiment conducted in the U.S. confirmed that employing social norms in message campaigns is an effective way to encourage hotel guests to make greener choices (Goldstein, Cialdini, & Griskevicius, 2008). This research found that the hotel 'industry standard' message—"help save the environment"—led to just a 35% towel re-use rate. That rate climbed to 44% when social norms were deftly incorporated in the message, as simply as: "Join your fellow guests in helping to save the environment". When the social norm message was augmented by adding in the guest's room number—effectively personalising the normative guidance to: people like you, in circumstances like this—the rate of towel re-use climbed to 49%. These normative message interventions are inexpensive but often powerful. The effects are far from trivial: one of these researchers calculated that if hotel guests complied with towel re-use messages, each year an average hotel would save 270,000 litres of water, 39 barrels of oil and 1800 litres of detergent from being flushed into the environment (Cialdini, 2007). In another study similarly exploiting the power of social norms, U.S. residential electricity/gas customers were sent energy usage reports comparing their consumption with similar households (Allcott & Mullainathan, 2010). In these fully randomised trials, involving hundreds of thousands of customers, the typical household receiving this comparative guidance decreased their energy consumption by about 2.7%. If this simple intervention were implemented across the nation, estimates indicate it would reduce carbon emissions by 12.7 million tons (MtC) per year, and net savings in excess of $2 billion over the life of the program.

being ‘best’. That is, they use as much cognitive effort as required to arrive at satisfactory, rather than optimal outcomes. This is because human cognitive powers are quite limited relative to the abundance and complexity of information typically encountered, and the volume and frequency of daily decision-making.

Thus, cognitive biases, shortcuts and heuristics are the constituent components of a pervasive satisficing strategy, in which people rely on simplifying devices and cues, rather than undertake exhaustive evaluation of all information relevant to a decision. Clearly it is essential, when endeavouring to persuade consumers to adopt a new mode of service provision that we carefully consider the heuristics they employ to simplify, make sense of, and move through their environments. We emphasise that much of this takes place below the level of conscious awareness.

This, then, is a very different picture than that painted by classical economics and widely adopted as common wisdom. The bottom line is that any organisation that seeks to persuade consumers to shift their behaviour – to make a certain choice, to adopt a particular course of action, to take up a product/service offer – must somehow, before all else, find a way to cut through this ‘wall of noise’ that is everyday life.

2.2 Applications to uptake of solar gardens

2.2.1 Psychological barriers to take up

More specifically in regard to the solar gardens ‘offer’, we anticipate (below) a range of psychological **barriers to securing participation**, including some (difficult to avoid) information complexity, and process obstacles that might divert interest before it can be converted into uptake, in concert with consumers’ pervasive tendencies to procrastination and ‘future discounting’.

As we have endeavoured to emphasise throughout the project, these ‘barriers’ can simultaneously create **opportunities to increase uptake**, either by avoiding or (better yet) actually taking advantage of these phenomena to secure the desired outcome. We stress that a psychological issue that is detected and averted, even exploited, can ultimately turn what looked like a barrier into a stepping stone to success. Indeed, our core business at Concentric.Energy is exploiting the many oddities in human decision-making that often constitute barriers to shifting behaviour, and transforming them instead into footholds on the path to the desired behavioural change. This at least is the ideal we suggest aiming for, and certainly the soundest way for any consumer-facing project of this nature to proceed.

Information complexity

As anticipated in the preceding discussion, inevitably the most critical challenge confronting efforts to promote a solar garden is that the ‘offer’ must compete with the flood of information that people encounter each day. In such an environment, any campaign materials must vie for attention with the vast ‘wall of noise’ that we all have to process in our daily lives. As noted,

numerous studies[3] have found that in an environment of complexity, people are inclined to adopt the default option, revert to the status quo, or avoid decision-making. The general finding – that decision-making deteriorates, or is avoided altogether, the more information and/or choices people confront – has been replicated time and again in many different contexts. Since the reality of human decision-making directly contradicts the common sense intuition that citizens' decision-making (and likelihood of responding in the suggested direction) will be aided by the provision of more information, achieving simplicity -- in the solar offer itself, the associated messaging, and the materials that promote it – will be absolutely critical.

PROCRASTINATION

Further, we note that humans have a deep attachment to the status quo and strong inertial tendencies toward continuing to do what they are currently doing, even in the face of strong arguments and/or hefty incentives. Note further that the (actual or perceived) complexity of a decision or task tends to exacerbate this inclination to procrastination, avoidance, and non-response. This suggests it will be difficult, in any case, to extract a positive decision from potential solar garden subscribers, and especially, that they will tend to avoid anything that:

- necessitates much information-processing
- appears complex, or seems to pose uncertain risks
- demands attention, engagement or monitoring; and/or
- requires a behavioural response.

The more complex the offer and/or associated materials, and (relatedly) the more risky it is perceived to be, the greater the tendency to procrastinate, or avoid engaging altogether.

FUTURE DISCOUNTING

Additionally, research in behavioural economics makes clear that a widespread tendency to **temporal discounting** can impede customers' perception, and proper weighting, of the benefits being touted in any offer. It is well established that humans tend to excessively discount and under-value things that are further away in time, or space (see Frederiks, Stenner and Hobman 2015 for a review). This underscores the reality that, to have a chance of being persuasive for most people, the purported future benefits of any solar gardens offer need to be very concrete and clear, and delivered as soon as possible, to the individual incurring the costs in the present. Typically, we are asking potential subscribers to incur considerable costs upfront in return for benefits only secured over a lengthy period of time (e.g., 5 years at a minimum). We know this will be psychologically challenging and aversive for many consumers. Two alternative ways of responding are to make subscriber benefits more immediate or (more likely) have more of the consumers' costs deferred.

[3] For example, in a field experiment in the consumer credit market, Bertrand et al. (2005) found that bank customers' uptake of a short-term loan offer was greater among those who received less complex information about the offer than among those who received more complex information.

MEREST OBSTACLE

Finally, but importantly, we regularly find that decision and action are thwarted by the 'merest obstacle'. Given people's strong preference for simplicity and ease, and their tendencies to inertia, procrastination, and discounting of (especially diffuse and future) benefits, the merest obstacle can divert people, giving rise to avoidance, non-decision, inaction. Some obstacles especially likely to limit the success of a solar gardens project might include, for example:

- Situations where uptake of a new product/service first requires an initial 'expression of interest', or entails a multi-step sign-up.
- Processes involving any delays (for instance, having to wait for the computer to start up, for one's information to be accepted/confirmed, or for the welcome package to arrive in the mail) (see Ariely and Wertenbroch 2002).
- Actions necessitating any 'channel-switching' (for instance, a 'snail-mail' invitation to subscribe that requires online sign-up, or a phone call to activate).

2.3 Market research design and implementation

2.3.1 METHODOLOGY

Apart from the provision of core behavioural insights relevant to consumer behaviour, our other major contribution to the solar gardens project has been methodological. The core methodology of behavioural economics is the **Randomized Controlled Trial (RCT)**, in which researchers test the relative impact of variations – in the incentives, framing of the offer, motivating messages, visual presentation, mode of delivery – just as a medical researcher would test the efficacy of alternative treatments. Indisputably, across both the health and social sciences, this kind of fully randomised and properly controlled experiment remains the 'gold standard' for determining the causal impact of different explanatory factors (e.g., alternative promotional materials) on any outcome of interest (e.g., solar uptake).

The traditional research alternative of the **focus group** certainly has a role to play in exploratory research during preliminary stages of consumer-facing projects of this nature. However, explicitly asking research subjects to report their impressions of / imagined future behaviour in response to a variety of campaign materials (for instance), is a demonstrably inferior means of gauging the likely impact of alternative approaches to the consumer. These kinds of 'self-reports' are, for one thing, notoriously unreliable. It is known that people have little access to their own internal processes, and that their reports of their preferences, intentions, and likely future behaviours bear little relation to how they will ultimately behave. It is far better, then, if our research subjects remain wholly unaware they are part of any 'test', and we simply observe how they *actually* behave in response to various (randomly assigned) 'treatments', representing alternative approaches being considered for a project.

Consider that in non-experimental research – like focus group discussions, and also simple observational surveys – participants are *knowingly* part of a study, and often an explicitly comparative exercise at that. In contrast, participants in our RCTs are never explicitly asked to supply their impressions of, or consciously calculate their likelihood of responding to, alternative materials (a typical focus group method). Rather, we are able – just by directly comparing

participants' readily observable responses to randomly assigned alternatives – to isolate the *relative* effectiveness of (for example) different promotional materials. We simply observe the varying behavioural response (to alternative materials) of groups of recipients that had been 'equal on average' at the outset (i.e., prior to their receipt of these materials).

By virtue of this initial group equivalence (achieved by random assignment), it is *as if* each group had reacted to each alternative set of campaign materials, *but* with less of the bias introduced by participants *knowing* we are studying the relative impact of different materials, and perhaps shaping their responses to accord with (or even foil) what (they imagine) the researcher expects, or hopes to find (i.e., so-called 'demand characteristics') (see Brewer 2000).

Finally, we note the **certainty and precision** (here, of campaign effects) that are delivered by the RCT methodology. Since research subjects (representing prospective consumers) are randomly assigned to view different campaign materials (for example), any differences subsequently discerned between the groups in their 'uptake' of the solar offer can only be attributed to the different materials to which they were exposed, since everything else about them was 'equal on average' at the outset. Ultimately, this methodology delivers:

- **certainty** that any observed change in behaviour is truly attributable to the particular materials that were viewed, and
- **precision**, since one can identify exactly how much more of the desired behaviour (e.g., uptake of the offer) was induced by one set of materials relative to another.

3 Applications of behavioural economics

3.1 Overview

As described in the foregoing, behavioural economics comprises both:

- a psychological **theory** of human behaviour resting on a set of observed empirical regularities about certain peculiarities in our decision-making

and, also:

- a core **methodology** for empirically testing the impact of alternative 'interventions' in shifting some behaviour of interest (e.g., uptake of a solar garden's offer).

In support of the Solar Gardens project, Concentric.Energy drew heavily upon both the theory and methodology of behavioural economics, deploying each in various applications in pursuit of the project's primary objectives.

In overview, Concentric.Energy provided two main types of inputs to the project, giving advice and/or assistance with respect to:

i. **Theory**. As required, we provided behavioural **insights** regarding the influence of psychological biases/affective factors on human decision-making and behaviour, identifying a predictable set of ways (Ariely's "predictable irrationality") in which our choices regularly deviate from that anticipated by classical "rational choice". The latter assumes that the decision-maker/actor simply maximizes their utility following a comprehensive analysis of all the objective costs and benefits of alternative courses of action. We particularly sought to focus project members' attention on those psychological distortions/affective influences we judged most relevant to the Solar Gardens project, most notably including: inertia and status quo bias, avoidance of risk and loss, the influence of social norms, and (especially) aversion to complexity and need for simplicity. All of these behavioural insights were ultimately brought to bear in our co-creation of solar gardens marketing messages and materials, first, in support of the ISF's market research efforts and, subsequently, in collaborating with the individual project teams as they developed their own 'mock prototypes'.

ii. **Methodology**. Beyond our co-design of those alternative marketing materials, we contributed also to their empirical testing. We supported the ISF's design and conduct of a number of Randomised Controlled Trials (RCTs) testing the impact upon consumers of these variations in message framing/presentation (our behavioural **'interventions'**). These alternative versions of the marketing materials were embedded in multiple rounds of Facebook campaigns. The initial round of testing investigated the general consumer appeal (here, click-through rates) of different marketing messages/materials of interest to all

project members. Subsequent rounds of Facebook testing then investigated differently framed/presented variations of the individual project teams' marketing materials. These 'mock prototypes' represented the online ads, webpages, flyers, posters, bill inserts or the like, that the individual project teams had created to appeal to their own target market(s). Concentric.Energy provided feedback in a series of teleconference discussions with each of the project teams, based on critical behavioural insights (as per (i), above).

The objective throughout was to identify – whether for the whole group ('Stage 1'), or individual project teams ('Stage 2') – the influence of different kinds of messages and motivations on consumers' attraction to the solar gardens concept. The ultimate goal was to determine which particular framing/presentation of each team's offer (their 'prototype') was most likely to promote consumer acceptance/uptake. We provide further details of our contributions to each stage of the market research, as follows.

NB: We recommend reading the following section in conjunction with the ISF report (see Riedy and Mey 2018) on these Facebook campaigns.

3.2 Stage 1 market research: initial Facebook campaign

Dr Chris Riedy of the ISF was responsible for leading the market research, designed to provide market intelligence to the Solar Gardens project as a whole, in preparation for members then splitting off into their site-based project teams to develop their own product 'prototypes'. Concentric.Energy provided **behavioural insights** to help fine-tune and enhance the alternative marketing materials developed, and subsequently, **methodological advice** around the design and conduct of empirical testing of their relative consumer appeal. For reasons previously discussed, ISF and Concentric.Energy determined that this should consist of a series of RCTs embedded in multiple rounds of Facebook campaigns.

We emphasise that Facebook simply served as a quick, convenient and inexpensive mechanism for empirically testing the relative impact (on target consumers) of alternative marketing messages/materials. The messages determined to be the most compelling might ultimately end up being conveyed by *other* means – such as direct mail-outs or bill inserts or magazine advertisements. To reiterate, testing alternative materials via Facebook did not necessarily reflect anyone's determination that a Facebook campaign *per se* represented the ideal means of promoting solar gardens.

3.2.1 Methodology: Testing the efficacy of campaigns

Facebook's 'split-test' (experiment) platform allows researchers to (quickly and inexpensively) conduct an RCT: to empirically test, via random assignment of viewers to alternative versions of a campaign, the relative impact of those different materials on the target audience (as evidenced by comparing divergent 'click-through' rates). Ideally, this can also include detection of audience effects, e.g., whether certain messages/images resonate more powerfully in a particular location.

3.2.2 Design

Using Facebook's split test platform, visitors to a Facebook page were randomly assigned by the ISF research team to alternative marketing materials we had worked up for a generic solar gardens project. It was possible then to examine a variety of internal (Facebook) metrics to determine each advertisement's relative effectiveness. For instance, a key outcome of interest was the number of users that clicked through (e.g., from the advertisement to some separate EOI page) using the link provided by the campaign. These click-through data, broken down by experimental condition, allowed for comparative assessment of the relative 'success' of different ad versions in attracting consumer interest, including some limited investigation of audience effects, i.e., whether the impact of different kinds of consumer appeals varied across sites / market segments.

Note that our recommended methodology incorporated a 'test/re-test' approach, where the research team would revise and build upon the best performing campaign materials in further rounds of testing, allowing us to iteratively fine-tune the most demonstrably compelling messages for target consumers.

3.2.3 Messages deployed

Text content

As earlier discussed, one of Concentric.Energy's principal contributions to the project was to provide advice and guidance supporting the development of these initial marketing messages and materials (along with those that would subsequently be developed by the separate project teams for their particular site/offering; see Section 3.3 to follow). We encouraged everyone to start their deliberations with the basic information they wished to convey about the solar gardens concept, and then to experiment with different ways of conveying and framing the 'pitch'. This first round of generic testing for the project as a whole deployed three distinct marketing themes identified in initial Solar Gardens project deliberations and then explored in focus group discussions: an appeal to either social inclusion, household financial interests, or environmental concern. Across subsequent iterations of testing, messages were refined, or abandoned (at least for certain target audiences) or sometimes blended (e.g., forming a mix of social inclusion and financial appeals).

Informed by key behavioural insights, our primary emphasis was always, first, on reducing text density and complexity, and greatly simplifying the language and presentation of the ads (invariably our first piece of advice). As intimated in earlier discussion, the extant evidence is clear that less is more when it comes to messaging that aims to induce an action. The Facebook messages were all conveyed concisely in simple, everyday language, with an average length of around 45 words.

Beyond this quest for simplicity, we sought to embed within the differently-themed ads certain 'motivational' messaging. Based on our extensive experience with the power of normative appeals, we suggested to the ISF research team that social norm cues might be especially effective. As previously noted, humans tend to respond to signals about what "many other people" are doing by shifting their behaviour to conform with those social norms.

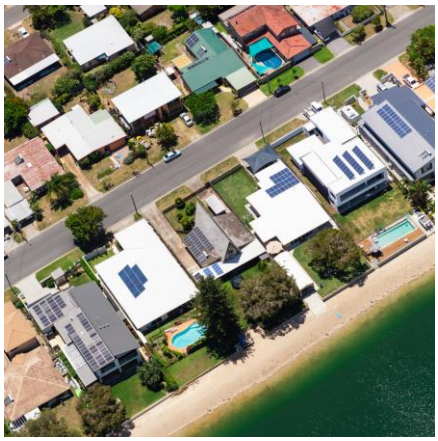
Our specific contribution here was to subtly incorporate (without jeopardising message coherence) these social norm cues into the differently-themed advertisements, as indicated by the highlighting of phrases below:

- **Social inclusion:** **Lots of people** are enjoying solar power – feel like you're missing out? Maybe you can be part of it all, *without* putting panels on your roof! It's called a Solar Garden – a new idea we think could work for your community. Find out more!
- **Financial:** You want to slash your energy bills, but can't put solar panels on your roof? With a Solar Garden you might still get to enjoy those savings, **like many other Australians**! It's a new idea that might just work for your wallet. Find out more!
- **Environmental:** **Like many other Australians**, you care for the environment ... but can't put solar panels on your roof? With a Solar Garden, you might still play your part! It's a new idea we think could work for you and the environment. Find out more!

IMAGES

As noted, the split-test platform is an efficient, low-cost way to quickly determine which version of a marketing campaign is most impactful. Overall, it proved a cost-effective means to pilot test messaging for solar gardens uptake. However, note that the platform is limited in terms of the number of experimental 'conditions' (here, alternative ad versions) that can be tested at one time. Facebook's split-test only allows five conditions to be tested at once and is, accordingly, not well suited to more complex experimental designs, such as factorial designs simultaneously testing message *and* image effects, both additive *and* interactive, e.g., is it some particular *combination* of message and image that seems most effectively to move people?

With Facebook constraining us to testing just five alternative 'interventions', we had to limit our testing to the relative impact of alternative messages (as above), while keeping to just a single unvarying image to match each theme (i.e., not independently varying both messages and images). Our intention with the image we ultimately matched to each message was simply to provide a single, appealing visual representation of its key theme. For example, we anticipated that this aerial shot of homes (below) might neatly resonate with the 'social inclusion' message, with the premiere beachside homes all boasting extensive solar installations, while the rooves of regular homes set further back from the beach were notably bare of solar panels. Our intent was that this image should cue (typically, below the level of conscious awareness) some recognition that while certain people can afford to take advantage of rooftop solar, others are 'shut out': the specific problem the solar gardens concept was ultimately meant to address.



3.3 Stage 2 market research: 'mock prototype' Facebook campaigns

As noted, a second stage of site-specific market research followed on from this initial 'generic' testing. This second round entailed the individual project teams developing – under guidance from Concentric.Energy – alternative messages/materials intended to promote their specific solar gardens 'offer', whose relative effectiveness were then tested by the ISF research team, this time led by Dr Franziska Mey.

We are unable to detail here the product development and market learnings of the different project teams, since that information ultimately remains confidential: proprietary to the utilities and community organisations involved in each case (in Blacktown, Byron Bay, Shoalhaven, Swan Hill, and Queensland). However, we are able to briefly describe our contributions to their efforts in general terms.

While there was some variation in the needs and constraints of different project teams, this second round of product development and research generally proceeded as follows. First, Concentric.Energy conducted a series of what were essentially 'mini-workshops' with each of the individual project teams. In highly collaborative discussions with each individual team – spanning two to four teleconferences, interspersed with numerous email and telephone conversations – we guided the development of the alternative marketing messages and materials each team had devised for their Facebook campaign testing. Again, these alternative ads each promoted uptake of the team's 'offer' with some simple information about solar gardens, but might vary in terms of message themes, framing, images or presentation. For example:

- cues about social norms (what "many other people" are said to be doing) might be included, or not
- one 'intervention' might focus on the financial benefits of solar while another emphasised caring for the environment
- one version might be dense and text-heavy while another sought a simpler presentation with emphasis on compelling visuals.

Once finalized, each project team handed over their alternative marketing materials to Dr Mey's ISF research team, who again deployed Facebook 'split testing' to determine the relative effectiveness of these alternatives in attracting the interest of each team's target market. Finally, the 'winning' marketing materials in each case were ultimately submitted back to the Solar Gardens leadership group as the project team's final 'mock protoype': their empirically-validated exemplar of how their proposed solar offer might best be structured, conveyed and promoted to their target market.

4 Recommendations

We close this report by offering a set of general recommendations we consider applicable to any customer-facing energy project of this nature, drawing on not just our experiences in this particular project, but also lessons learned from similar endeavours in which Concentric.Energy has been engaged, as well as a wealth of evidence from behavioural economics research in this and related domains. These recommendations mostly centre on enhancing simplicity and ease in ways that improve both customer uptake and effective usage of similar products and services, and remain applicable to the development of effective marketing materials for *any* customer-facing project.

4.1 What works? The empirical evidence

As noted throughout, there is a wealth of empirical evidence in behavioural economics showing that human decision-making often diverges from the 'rational choice', utility-maximizing assumptions and predictions of traditional economic models. Of greatest relevance to energy consumers, there is compelling scientific evidence (typically drawn from RCTs) indicating that:

i. Decision-making **deteriorates**, or is **avoided altogether,** as more information, and/or choices, are provided.

- Generally speaking, the more information/choices, the less decision/action. To induce the desired decision-making and behavioural change, all customer-facing materials and processes should be as short, simple and straightforward as possible.
- In seeking public understanding and acceptance of new energy products and services, energy retailers must compete with the flood of information that people encounter daily. Customer-facing materials must vie for attention in the vast 'wall of noise' that people must process each day.
- The general finding – that decision-making deteriorates, or is avoided altogether, the more information that people confront – has been replicated time and again in many different contexts (see for example Bertrand et al 2005).
- The reality of human decision-making directly contradicts the 'common sense' intuition that the likelihood of customers responding in the desired direction will be aided by the provision of more information.

ii. The (actual or perceived) **complexity of a decision or task tends to promote procrastination, avoidance, non-response**.

- People will tend to avoid anything that seems complex (especially if it requires a positive decision from them); that demands attention, engagement or monitoring; that necessitates information-processing and/or requires a behavioural response (e.g., peak demand alerts).

iii. Above all else, people seek **simplicity and ease**

- Apart from complexity generally being repellent and immobilising (as noted above), feelings of ease often serve as a powerful decision-making shortcut or 'heuristic'.
- How this actually works: if something is easy, the customer feels at ease. If the customer feels at ease, he/she concludes that this thing you want them to understand/accept/take up/do is (a) true, and (b) good for them (Kahneman 2011).
- Note that apart from a new product itself striving to be simple and easy, the materials and processes intended to support and promote the product must likewise aim to maximize simplicity and ease.

iv. People have a **strong, inertial attachment to the status quo**, and to all that is familiar (e.g., electricity pricing according to usage, not demand), and relatedly, a tendency to **stick with the default option**

- A great deal of evidence on human decision-making shows there is a strong, inertial tendency to preserve the status quo (Samuelson and Zeckhauser 1988).
- This can hold even when the status quo/default is patently unsatisfactory and/or the alternatives on offer promise significant gains, including the prospect of real material gains.
- Note, again, that this strong human inclination to stick with the status quo grows as the complexity of information and choices increase (Senecal, Lavoie, & Koestner, 1997).

v. A common tendency to **temporal and spatial discounting** impedes perception and proper assessment of benefits.

- Apart from decreasing the amount and complexity of information and choices, reducing its density and simplifying its presentation, we recommend formulating the customer's offer(s) in ways that magnify and emphasise immediate bill reductions and reduce the anticipated payback period as far as feasible and manageable.
- We tend to excessively discount and under-value things that are further away in time, or space.
- Purported benefits usually need to be very concrete, clear and immediate to have a chance of being persuasive. Where substantial investments are involved, we advise against focusing on appeals that play up the longer-term benefits (e.g., to the grid, infrastructure investment, future price pressures, the planet, even their property's future resale/rental value), in favour of clearly flagging for the prospective participant the immediate, the tangible and the personal: the magnitude of immediate bill reductions for customers themselves.

vi. Relatedly, people are highly **averse to risk and uncertainty**

- Customers will doubt the prospect of gains (especially easy, cost- and effort-free gains).
- They will question whether the uncertain benefits of a new offering are worth the risks and costs they might (and often expect to) incur (in terms of money, time, effort, inconvenience, discomfort), especially in the present.

- Given the aforementioned inertia and strong pull of the status quo, the perceived prospect of risk and loss can greatly exacerbate the inclination to avoid a new offering – particularly a product promising a "new way" of doing things.

vii. The **framing of an issue can fundamentally alter the response.**

- Decision-making is often swayed by irrelevant "framing" of the problem and/or solution. Much depends on how something is framed (and sometimes, merely what it is named).
- For example, the framing of material incentives is often tricky, as a dollar is not always a dollar. Seemingly straightforward incentives – like rebates, or cash sign-up bonuses – can sometimes actually reduce uptake of an offer/subscription to a program, e.g., load control.
- They can make people angry (*"A rebate? So that's you giving me my own money back, and I'm supposed to be grateful?"*) – and sometimes the bigger the rebate, the angrier!
- In contrast, a $50 store card can sometimes work where a $50 cash bonus won't. Apparently, it feels like a gift – a present you get for doing something nice – rather than a direct cash payment for something you should have been public-minded enough to do in any case.
- This is partly a matter of people's distorted perceptions of loss and gain, risk and uncertainty, as well as our general susceptibility to irrelevant framing effects.
- Beyond that, it can also involve the sometimes detrimental impact of material incentives on non-material motivations (as below).

viii. **Material incentives can sometimes fail**.

- Finally, we note that it remains possible, in certain contexts, to secure significant behavioural change by utilising the "warm glow" that can be generated by acting altruistically. And one can sometimes actually thwart behavioural change by "crowding out" this "warm glow" with material incentives.
- For this reason, we advise proceeding with caution in devising campaigns, and taking great care with any intervention that combines different motivations, or that risks undermining and displacing existing public goodwill.
- Generally speaking, if misplaced/poorly-framed material incentives make people's behaviour seem (if only to themselves) merely self-interested, they can sometimes crowd out the warm glow people might otherwise have felt from acting only on altruistic/other-regarding/community-minded motives. This can sometimes actually diminish the behaviour one was trying to 'incentivize'.

Overall, the extant empirical evidence in behavioural economics offers *general* guidance regarding the many ways in which human decision-making tends to deviate from 'rational choice' assumptions. While the behavioural economics literature alerts us to the challenges we are likely to encounter in devising campaigns to promote any desired behaviour, it also emphasises the need to first subject our proposed 'interventions' to careful (ideally, iterative) empirical testing within our *specific* behavioural domain and decision context.

4.2 Concluding observations

We conclude this report by briefly outlining for future consideration some critical, often-observed **advantages of employing a behavioural economics approach** in these kinds of customer-facing projects, as follows:

- Will often be **cost-neutral for the organisation**, and typically **delivers a high return on investment**, with simple, inexpensive, readily mass-scalable interventions being unobtrusively embedded within normal business processes.

- Delivering psychological cues is an **inexpensive intervention** relative to education campaigns, incentives, and subsidies.

- **Dovetails nicely with technological solutions** to problems, since technology often provides the 'facility' for behavioural change.

- Is particularly well-suited to improving outcomes for the hard to reach, and **shifting the behaviour of the hard to move**.

    a. On a number of occasions, we have successfully shifted the behaviour of segments of the population considered 'difficult to move', who were acting in a 'sub-optimal' manner (broadly defined), e.g., were non-compliant; not engaging or participating; not taking advantage of opportunities or utilising the best available channels.

    b. Using carefully-designed psychological interventions to induce those first tentative forays into some unfamiliar behaviour can help establish new habits, which can then strongly influence future behaviour and cement routines.

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