Research Approaches Overview

Stakeholder Engagement on Complex and Long-run Issues in the Energy and Water Sectors

A paper by BritainThinks and London Economics

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This paper was commissioned by Sustainability First for the New Energy and Water Public Interest Network - New-Pin

Views expressed in the paper are those of the authors. Views expressed are not those of Sustainability First or members of the New-Pin Network

1. Overview

Background

Sustainability First is a small environment think-tank with a focus on practical policy development in the areas of sustainable energy and water. In 2015 Sustainability First launched 'New-Pin', the New Energy and Water Public Interest Network. This network brings together a range of companies, regulators, government departments, public interest advocates (consumer, environmental and civil society groups) and academics to take part in a series of workshops focusing on the long-term public interest in the water and energy sectors.

New Pin's workshop in October 2016, **'Consumer, citizen and stakeholder engagement, and capacity building'**, discussed how citizen and consumer representatives and experts can be engaged in long-term issues, (resilience for example), particularly when complex trade-offs and cross sector impacts are involved. To feed into this discussion, BritainThinks was commissioned by Sustainability First to write this paper to explore how different research approaches for engaging individual consumers can help uncover the long-term public interest in complex areas. London Economics assisted Britain Thinks by working on the quantitative methods included in this paper. Views expressed in the paper are those of the authors. Views expressed are not those of Sustainability First or members of the New-Pin Network.

Objectives and intended audience

The purpose of this paper is to provide an independent and objective high-level overview about different research approaches relevant to uncovering the long-run public interest in the water and energy sectors, and which can be of practical use to decision-makers. The paper sets out the advantages and disadvantages of different research techniques to assess complex long-term issues. The intended audience is primarily consumer, citizen and environment groups. The paper assumes a basic knowledge of market research approaches. It is anticipated that the information in this paper will be used by stakeholder groups in their interactions with water and energy companies and regulators. For example, it may help members of a Customer Challenge Group when they are considering what may be the most appropriate research approach to use to meet a given objective, given the possible outcomes and impacts from using that technique. It may also help company and regulatory colleagues who are not experts in market research.

Energy and water companies, regulators and government, have hitherto largely used Willingness to Pay research, as a key input to long-run decision making in

areas where market price information is not available[1] (for example, as a part of the 5-yearly price review process for the water companies). This paper provides a high-level overview of these methodologies. It also discusses alternative or complementary techniques to sit alongside these more conventional or economics-based approaches, in seeking to capture consumer and public views on long-run complex trade-offs.

Where possible we have tried to provide some case studies to illustrate where these research approaches have been used in the water or energy sectors. Section 5 of this paper offers references to other sources of information on the different approaches for those with a deeper interest in the area, and an indication of where such approaches have been used in other markets, for example in the financial services or communications sectors.

Summary of approaches

The research approaches set out in this paper share the following relevant characteristics:

- **They involve direct interaction with customers, for example via surveys or workshops (except in the case of some revealed preference techniques which look at customer data)**
- **They provide practitioners with the opportunity to explore long term and / or complex issues**

Use of such research methodologies can enable organisations to build a thorough understanding of customer views and attitudes around long-term or complex issues in order to bring the public perspective into business decision-making. They split broadly into **quantitative approaches** (Stated Preference and Revealed Preference techniques that reveal values and Behavioural Experiments which test responses) and **qualitative approaches** (Deliberative Research and Qualitative Panels that can demonstrate the principles driving thinking).

At the highest level, and as a **general rule of thumb**, **quantitative approaches** will provide organisations with **robust** findings which are statistically significant and therefore representative of a population as a whole (and / or selected sub-sets of a population). Their findings offer quantified data that can be scalable and from which wider inferences can be made. Such quantification can be used to make comparisons and to feed into Cost Benefit Analysis (e.g. Stated Preference) and to design customer programmes and policy interventions (e.g Behavioural Experiments). **Qualitative approaches** can provide an **in-depth** exploration of views and a more considered input on a particular issue. Such approaches can give insights into why people think the way they do and how individuals or groups might approach complex trade-offs.

[1] Valuation methods, such as Willingness to Pay research, are used when the value of a good or service cannot be inferred from the price paid for the service (e.g. water and wastewater services) or because they are non-priced (e.g. environmental services)

While this paper offers a broad outline of each approach, it is important to note that no single approach works in isolation to provide a full 'solution-set' to issues with the levels of complexity likely to be explored. Rather, the ideal would be to **use a range of different techniques** and build up a fuller and more robust picture of stakeholder and customer opinion. For example:

- **Qualitative approaches can be used to inform the design of quantitative surveys** (e.g. to identify outcomes to test in choice modelling exercises or to ensure the 'right' language is used)
- **Quantitative approaches** can explore the prevalence of views identified in qualitative studies. Or, identify differences between demographic groups
- **Qualitative research** can additionally be used to explore and flesh out quantitative findings in more detail (e.g. to understand drivers behind unexpected results or to better understand a particular demographic perspective.)

Use of a range of techniques can help build a richer and more flexible picture of the **public interest**. This can also be adapted to take local views into account. However, the downside is that this can then lead to a more fragmented picture, which could make comparisons between different organisations harder.

Ultimately, the most appropriate research approach or combination of techniques depends on an organisation's objectives. **The following questions may be a useful guide for public interest advocates involved in considering which research methodology to select when considering how to better understand long-term and complex trade-offs**:

- What is the **overall purpose** of the research (for example, hard data on customer preferences; understanding trade-offs made by the public; the perspective of local communities etc.)?
- What **budget and time** is available?
- Have you considered a mix of different research techniques to obtain the insights you seek and / or the order in which to do this?
- For different research techniques, how informed do the public need to be about an issue, to be consulted on it? There are pros and cons of informing consumers at the start of research activity (it can increase understanding and motivate respondents to take part but, on the downside, may shade / influence their input)
- What are the potential biases to be aware of (e.g. 'present' bias, 'optimism' bias, 'framing' bias etc.)? How can the research agency structure the research to avoid these?
- Is the number of choices / variables being explored practical? For example, from both the point of view of the engaged public (too many may be confusing); and for those carrying out and using the research?
- With which audience do you need to engage? (for example, 'mainstream' customers vs business; hard-to-reach customers)? How can you reassure that the sample is representative / appropriate?
- What research has already been conducted in this area? Is it comparable?
- What research are others currently commissioning? How will this build / complement that?
- How / will the research be piloted?

- Who will 'own' the research? How will its findings be expressed / made public?

The table overleaf summarises the research approaches, the types of situations they might be used for, and the outcomes that might reasonably be expected from adopting them.

Research Approach	Outcomes / what it can provide	Summary	Also known as / includes	Best for		Other points to note
				Robust data	Deep insight	
Stated preference	Valuation of goods and services that have no market price; indication of relative values attached to different attributes	Quantitative surveys that ask people to determine the value to them of a good / service	Contingent Valuation; Choice Modelling / Choice Experiments; Willingness to Pay (WTP) / Willingness to Accept (WTA)	✓		Water companies were required to conduct stated preference surveys with customers as part of the 2014 Ofwat price review process to establish willingness to pay
Revealed preference	Valuation of goods and services that are part of a market but not directly bought and sold	Quantitative techniques that look at people's behaviour to estimate the value of 'non-market' goods / services	Travel Cost method; Hedonic Pricing	✓		
Behavioural experiments	Indication of how public will behave	Quantitative techniques which compare how different interventions affect behaviour and allows testing of customer responses	Sits within Behavioural Economics	✓		Often used in conjunction with qualitative focus groups and quantitative surveys including stated preference
Deliberative	In-depth exploration of public views on an issue	Qualitative face-to-face workshops in which people are provided with sufficient time and information to come to informed decision about an issue	Citizens' juries		✓	
Qualitative panels	In-depth exploration of public views on an issue and changes over time	On-going qualitative research with same group of participants	Reconvened groups		✓	

2. Research approaches

For ease of use we have separated the research approaches described below into two categories: **quantitative** and **qualitative**. However, as discussed above, considering the complexities of long-run public interest issues for the water and energy sectors, more than one method may well be suited to meet an organisation's objectives.

This paper focuses on specific research techniques that can be used with individual consumers to explore long-term complex issues and trade-offs. *The paper therefore does not cover traditional / 'simple' quantitative and qualitative research methods (such as bespoke focus groups). These, however, are valuable techniques to assess and explore current customer satisfaction, current awareness and attitudes. Those techniques can also be used in a 'discovery phase' to help inform the more focused research approaches described below.*

For each technique examined, we provide an overview of the approach, a list of the possible pros and cons, issues to consider, possible outcomes / results that can be expected from that type of research and, where possible, a brief case study of where it has been used.

Quantitative research approaches to provide robust data

a) **Stated Preference - willingness to pay / accept techniques**

Overview
Stated Preference techniques ask individuals how they would act, or what they would choose or prefer, in a given hypothetical situation. These techniques can be used:

- when an individuals' valuations of goods, services or outcomes cannot be observed through market prices (e.g. an environmental benefit)
- to provide consumer valuations of future changes to policy or other situations/circumstances in a manner that is comparable for future Cost Benefit Analysis and is scalable

Stated Preference techniques take the form of surveys that ask a representative sample of respondents questions to determine the value to them of some good or service. These questions ask an individual what they are willing-to-pay (WTP) or willing-to-accept (WTA) for some change in provision (for example, for a water company to have more or fewer pollution incidents). These techniques are useful for eliciting consumers' preferences regarding future changes.

Stated Preference techniques were used by water companies in the UK as part of the 2014 Ofwat price review process to reveal customers' preferences for different service provision aspects. A publication by UKWIR (2011) provides

detailed guidance on how to carry out these methods.[2] Approaches to research and engagement in the water sector are evolving under the Water 2020 programme for the next price review. Defra also commissioned the National Water Environment Benefit Survey (NWEBS) to estimate values for recreation, amenity and non-use benefits from improving the water environment. The approach used both choice modelling and contingent valuation to estimate households' valuation for improvements in the water environment brought about by the EU Water Framework Directive. In the energy sector, Ofgem have used these techniques to estimate the 'value of lost load' (Ofgem & DECC 2013, and Ofgem 2012)[3] [4] and to estimate consumers' valuations for options to mitigate visual amenity impacts from existing infrastructure (Ofgem 2011)[5].

Stated preference techniques can take two forms:

1. Contingent Valuation

This is generally used to reveal customers' valuation of a good or service as a whole. Ofgem (2011) provides a discussion of the different types of questions that can be used in contingent valuation surveys.[6] The most common types of contingent valuation question are the payment card[7] and dichotomous choice questions[8], which were the formats recommended by Accent (2010) to the (former) Competition Commission (now the Competition and Markets Authority).

2. Choice Modelling

In comparison, choice modelling is used to elicit values in regard to specific attributes of a good or service. For example, the factors concerned in a power outage can include its duration, the frequency of outages, and the time of day and time of year that they occur. Choice modelling can be used to determine the relative value respondents place on each of these.

The table overleaf provides a summary of the two methods.

[2] UKWIR (2011) Carrying out willingness to pay surveys, a report by Nera and Accent. http://ukwir.forefront-library.com/site/uk/water-research-reports

[3] Ofgem & DECC (2013) The Value of Lost Load (VoLL) for Electricity in Great Britain, a report by London Economics. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224028/value_lost_load_electricty_gb.pdf

[4] Ofgem (2012) Desktop review and analysis of information on Value of Lost Load for RIIO-ED1 and associated work, a report by Reckon Research. https://www.ofgem.gov.uk/ofgem-publications/47154/riioed1conresvoll.pdf

[5] Ofgem (2011) Review of company surveys on consumers' willingness to pay to reduce the impacts of existing transmission infrastructure on visual amenity in designated landscapes, a report by London Economics. https://www.ofgem.gov.uk/ofgem-publications/53802/visualamenity.pdf

[6] ibid

[7] Respondents are presented with a payment amount (randomly varied across respondents) and asked whether they would be prepared to pay it or not.

[8] Respondents select their maximum willingness to pay from a list of possible amounts.

	Contingent Valuation	Choice Modelling
What is it?	Respondents are asked directly what they are willing to pay for a specified change.	Respondents are asked to make a number of choices between different (hypothetical) scenarios with different prices.
What does it cost?	Less costly than Choice Modelling because the good or service is described as a whole and not broken down into attributes. Therefore, the design of the survey is simpler and sample sizes are generally smaller, plus analysis of the data is less complex than Choice Modelling.	More costly survey as the good or service is broken down into attributes therefore it is more costly to design.
What is the timescale?	Shorter timescale required.	Longer timescale required due to increased complexity of design.
What is valued?	A non-market good as a whole.	Allows for valuation of the good as a whole and specific characteristics/attributes of the good.
What skills are required?	Relatively simple methodology (survey design and subsequent data analysis) and task easier for respondents (risks of random response error lower[9]).	Higher complexity in survey design and analysis. More complex task for respondents which may result in random response error.
What are the most important problems?	There are a large number of identified biases that need to be taken into consideration when designing, implementing and evaluating contingent valuations	The choice and level of attributes to employ in a survey (the number of variables should be limited), method of survey implementation (i.e., face-to-face, phone, computer), choice of econometric methods to analyse survey data As with Contingent Valuation, the survey needs to be designed to minimise biases.

Source: London Economics published in Ofgem (2011) Review of company surveys on consumers' willingness to pay to reduce the impacts of existing transmission infrastructure on visual amenity in designated landscapes.

The table below outlines some of the main advantages and disadvantages of Stated Preference methods both Contingent Valuation and Choice Modelling.

Pros	Cons
• Provides valuations (Willingness To Pay) for goods and services that have no market price. • Can be used to elicit both use values[10] and non-use values[11]. • Samples can be designed to target the specific population	• Extreme care must be taken to avoid certain known biases that reduce the robustness of the results. There are a number of these biases that require careful design, but hypothetical bias – that the

[9] Random response error can occur when the respondent does not understand what they are being asked to value and they instead provide a guess/random response without considering their true valuation for the good or service.

[10] This is the value a person puts on a good or service they actually experience or use. For example, an environmental impact they experience e.g. an open space they visit, clean reliable water supply, low levels of pollution in a place they live, work or visit.

[11] This is the value people place on goods and services they do not actually experience or use, or even have the option to use themselves, e.g. these may be outcomes for future generations.

of interest (e.g. a company's own customers, vulnerable consumers or certain socio-demographic groups). • If the sample is representative of the target population, then this estimate can be aggregated to obtain an estimate of the total value of the outcome or good. • Can measure the preference for a change in one / all attributes and can be used to estimate the costs of a loss without that loss happening.	respondent is making a decision in a hypothetical setting, is of key importance. • Data analysis must be done carefully to ensure results are interpreted correctly. • Can be costly depending on the sample size required, target population and survey method used (online methods reduce the cost substantially and so can be used to generate larger samples but sufficient measures will need to be put in place to ensure that a balanced and inclusive sample is used).

Considerations

Organisations considering using Stated Preference methods should consider the following:

- Is there existing data – market prices or other revealed preference data – that can be used to provide a valuation?
- The stated preference questions must be carefully designed and accompanied with a clear explanation of the policy setting, or the change in circumstances that is being valued:
  - Variances in question wording means that answers between studies cannot be directly compared.
- When possible and where other studies are available, the results of the Stated Preference survey should be compared with:
  - Results obtained using other methodologies e.g. revealed preference methodologies (such as travel cost discussed below).
  - The findings of cross-study analyses (e.g. meta-analysis[12]) and sensitivity analysis to determine how robust the values are.
- Analysis should be undertaken to assess whether results are in line with prior expectations based on economic theory, other empirical results and intuition. For example, it is common to expect that WTP increases with income, and education level, socio-economic group, lifestage and familiarity of topic may all impact on WTP. Such hypotheses should be tested.

[12] Meta-analysis involves combining data from a range of studies and analysing the combined data to determine if an effect is present. For example, Gen, S. (2004). Meta-analysis of environmental valuation studies, undertakes a meta-analysis of valuation methods for environmental values. The research paper is available at https://smartech.gatech.edu/handle/1853/4843. For details on how to conduct a meta-analysis see http://handbook.cochrane.org/chapter_9/9_analysing_data_and_undertaking_meta_analyses.htm

Outcomes

Stated Preference techniques provide organisations with a numerical (monetised) estimate of consumers' preferences, meaning that they are directly comparable with all other preferences and also against costs (for example, in cost benefit analysis). Because the survey is conducted with a large representative sample, results can be scalable to the wider population. In the UKWIR report (2011) it is recommended that where market data on prices paid for goods are services is available this should first be used, if no market data is available then revealed preference data should be sought, if revealed preference data is not available (or feasible) then Stated Preference methods should be considered.

Case Study: Value of Lost Load in Electricity

The purpose of this 2013 study for Ofgem and DECC was to undertake quantitative research to derive estimates of the benefit of reducing the frequency of supply interruptions for domestic, SME and industrial and commercial electricity users in Great Britain. These estimates of VoLL (the value of lost load) have since been used in decision-making on Electricity Market Reform.

The research was based on a variety of methods. A major element of the work involved using Choice Experiments to estimate VoLL for domestic and SME customers in terms of willingness to accept (WTA) compensation for an outage and willingness to pay (WTP) to avoid an outage. The experiments were designed by London Economics and implemented by market research agencies. London Economics was responsible for analysing the choice experiment data in order to generate estimates of VoLL. The Choice Experiment approach allowed London Economics to estimate WTA and WTP for electricity outages of different lengths, seasons, and days of the week using statistical techniques (conditional logistic regression).

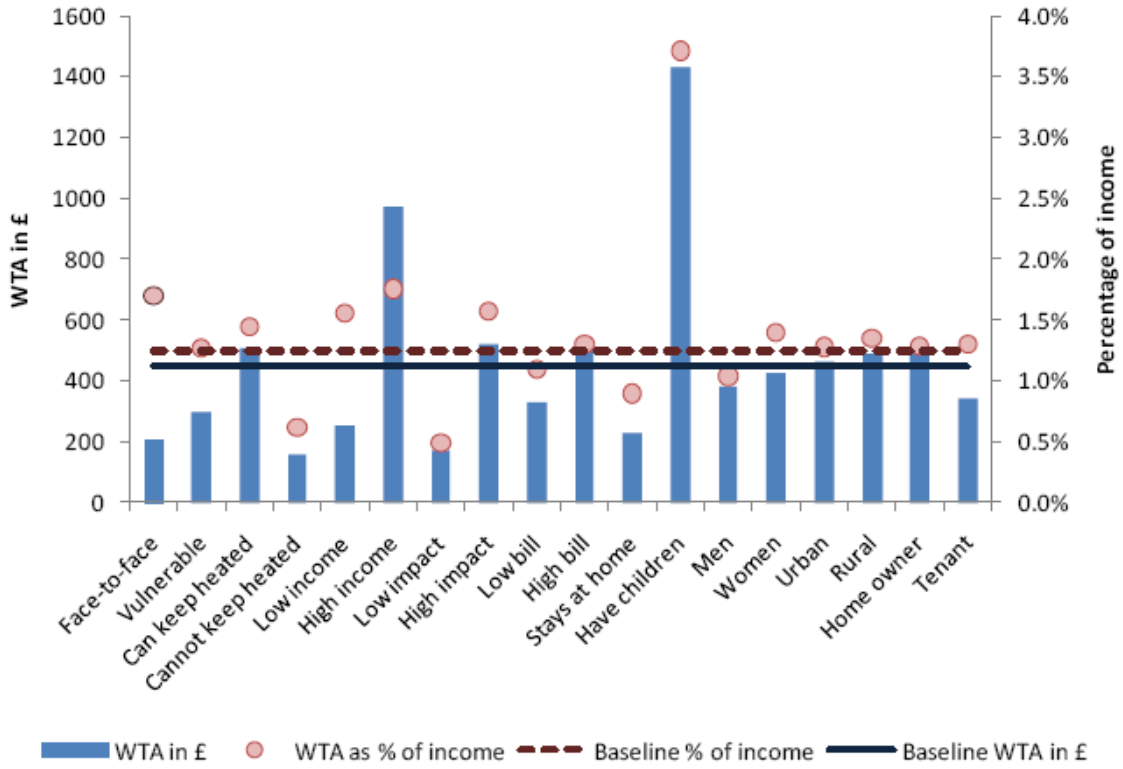
Example Choice Card (WTP)

	Option A	Option B
It lasts for ...	20 minutes	4 hours
At this time of the year ...	Not Winter	Winter
At this time of the day ...	Off Peak (10pm to 2pm)	Peak (3pm to 9pm)
On a ...	Weekend / bank holiday	Weekend / bank holiday
The one-off amount you pay to avoid this happening	£15	£1

Please choose the option you prefer

- ○ Option A
- ○ Option B
- ○ Don't know

The figure below presents households' willingness to pay to avoid a one month outage once in 20 years in the winter. The results are reported by customer type (e.g. customers who struggle to keep their house heated) and compared to the baseline WTP for a large online sample which was structured to be broadly representative of the Great Britain (over 18 years) population.



Source: London Economics (2013) Estimating value of Lost Load, a report for Ofgem.

The final report can be accessed here.

b) Revealed Preference techniques for non-market goods

Overview

As with Stated Preference methods, discussed above, Revealed Preference methods are used to estimate the value of 'non-market' goods - that is, goods without an explicit market price – and provide comparable data. **While Stated Preference methods ask consumers hypothetical questions about how they *would* behave in certain situations, Revealed Preference methods examine how they *do* behave.**

One Revealed Preference method that is particularly relevant for this paper (as it is often survey based i.e. involves direct engagement with the public) is the **Travel Cost method,** which examines valuation by assessing the costs consumers incur when consuming the good in question. It is most widely used to estimate economic use values associated with ecosystems or sites that are used for recreation such as parks, wetlands, coastal areas. For example, the number of visits a consumer may make to a park in a year may be related to the cost of a visit, the cost of visits to substitute sites, their income and other factors e.g. age, family size etc. The travel cost approach can value only environmental outcomes that are known to consumers. Further, it is limited to measuring direct consumptive uses only (Defra 2006).

In addition to the Travel Cost method, there are other Revealed Preference techniques that rely purely on customer data (as opposed to direct interaction with customers).These methods include Cost of Aversion[13] and the Production Function[14] approach. These are not discussed in this paper as they do not involve direct interaction with customers. The benefit of Revealed Preference methods is that they are based on observable market behaviour, thereby eradicating some of the biases inherent in survey based data.

The most relevant of these is **Hedonic Pricing** that involves exploring consumers' purchasing decisions in markets related to the non-market good of interest. It can be used to estimate economic benefits or costs associated with:

- environmental quality, including air pollution, water pollution, or noise
- environmental amenities, such as aesthetic views or proximity to recreational sites

For example, this technique may measure the valuation for environmental quality by assessing neighbourhood house prices as a function of factors including house characteristics, neighbourhood characteristics e.g. crime or school quality, and measures of environmental quality including air quality, or purchases of products to 'improve' service levels, such as bottled water or water filters.

Pros	Cons
• Valuation estimates are based on real choices made by consumers, and not hypothetical settings as with Stated Preference approaches • Hedonic Pricing studies can be more cost effective than primary data collection methods that employ surveys when suitable secondary data is available for analysis. • Travel Cost methods are generally less complicated in their survey design than Stated Preference methods, and therefore can be cheaper in their design.	• Hedonic approaches assume that there is equilibrium for the market goods e.g. equilibrium in house prices. This makes restrictive assumptions that may not be true in practice e.g. perfect information about house prices, zero transaction costs, house prices that are immediately responsive to changes in the supply of or demand for housing. • Hedonic valuation methods can struggle to effectively value small (marginal) changes in quality. • Approaches usually underestimate willingness to pay. For example, market proxy measures may underestimate valuation since consumers may be willing to

[13] This technique takes into account the **costs consumers avoid** because of access to the good.
[14] This technique explores the impact of changes in the quality or quantity of non-market goods (e.g. water quality) on the output of market goods (e.g. the volume or value of the catch of fish).

	pay more for e.g. clean air than is reflected by Aversion Cost techniques. • Measurement effort can be an issue for travel cost methods and it can be difficult to demonstrate which attributes are benefiting users. Unless research is carried out over time, it does not show the extra benefits of improving the attribute.

Considerations

Some issues to consider include:

- Checking estimates produced by the pricing approach against the predictions of economic theory (or previous empirical literature), to make sure that the estimates are backed by intuition.
- Checking estimates (where possible) against Stated Preference surveys.

Outcomes

Revealed Preference techniques provide organisations with estimates of customers' valuation of non-market goods by using evidence of how people behave in the face of real choices i.e. based on actual rather than stated behaviour. As with Stated Preference, Revealed Preference methods allow organisations to compare monetised data to other preferences and costs.

Relevant studies esp. relating to water, energy or environment

While there are a number of guidance documents on the use of Revealed Preference approaches in environmental valuation and cost benefit analyses in the UK, published case studies of where these have been used in practice are more limited. UKWIR (2011), provides guidance to water companies on the type of services for which Revealed Preference techniques are more appropriate than Stated Preference techniques in order to value changes in the level or quality of these services.[15] UKWIR identified 21 services for which benefits estimation could be required. Benefits for which Revealed Preference approaches were considered more appropriate than Stated Preference are: health effects of drinking water quality, sludge disposal and environmental impacts, construction impacts (e.g. congestion and traffic disruption), supply pipe liability, greenhouse gas emissions, management of specific habitats. Services for which willingness to pay approaches were considered appropriate include: supply interruptions, resilience (unexpected long term interruptions), water restrictions, river water quality, river water flows, coastal bathing water quality, and pollution incidents.

[15] UKWIR (2011) Carrying out willingness to pay surveys, a report by Nera and Accent. http://ukwir.forefront-library.com/site/uk/water-research-reports

Case studies of Revealed Preference approaches

An example of using Hedonic pricing comes from Mourato and Resende (2011)[16] who used a Hedonic Pricing approach to estimate the amenity value associated with proximity to natural amenities in England. Using prices of houses sold and controlling in a regression for characteristics such a house size, access to transport, distance to shopping centres and distance to open space, the authors were able to value a range of natural landscapes in the UK. They were able to infer from the house price data that householders were willing to pay up to £2,000 per year (in 2012 discounted prices) to gain improved environmental amenities and accessibility to natural landscapes.

In order to estimate the total economic value of a hydropower facility, the managing energy company used a Travel Cost method to estimate the non-market social benefits to recreational fishing from the reservoirs. The estimate was based on the average cost of travel and the angling fees paid by visitors to the site. These estimates were then combined with market based estimates for human consumption and irrigation (using a market based price approach - m3 of water multiplied by the water tariff minus operational costs) in order to estimate the total economic value of the facility. The results were used to compare a 'with' and 'without' scenario, and found that total economic value decreased by 92% in the 'without' scenario.[17]

c) Behavioural Experiments

Overview

A Behavioural Experiment is a quantitative technique used to compare how different interventions affect observed behaviour (as opposed to reported changes in behaviour or preferences from Stated Preference techniques and surveys). Behavioural Experiments differ from the other quantitative methods discussed in this paper because experiments test customer responses to programmes and policies. Experimental methods can help guide policy by providing insight into how a proposed policy change could affect behaviour in the future. The Competition and Markets Authority in its Energy Market Investigation Final Report[18], recommends that Ofgem test proposals to improve customer engagement in the energy market using behavioural experiments including Randomised Controlled Trials.

In a behavioural experiment, consumers complete tasks under different scenarios (or 'treatments') that vary the conditions under which the tasks are completed. Observed differences in behaviour between treatment groups are

[16] Gibbons.S., Mourato.S., and Resende.G., (2011) The amenity value of English nature: A Hedonic Price Approach, Social Economics Research Centre, Discussion Paper No. 74
http://www.spatialeconomics.ac.uk/textonly/SERC/publications/download/sercdp0074.pdf
[17] Water Valuation: Business case summaries, World Business Council for Sustainable Development, 2012.
[18] Competition and Markets Authority, Energy Market Investigation Final Report June 2016.

then used to interpret policy or business relevant conclusions. These experiments can be used at various different stages:

1. **Identifying problems:** for example, testing whether consumers have difficulty understanding relevant information in the terms and conditions of a contract.
2. **Diagnosing problems**: for example, testing whether consumers' difficulty is because key information is 'dripped', or 'hidden' behind a 'pop-up' button.
3. **Developing remedies**: for example, testing whether consumers make better choices if a future remedy is introduced, such as change in information presentation.

Experiments are increasingly being used by regulators in the essential services, because they allow researchers to design regulation based on a fine-grained understanding of how consumer behaviour changes – rather than consumer preferences. Furthermore, they are used widely by firms to understand the behaviour of their customers. Experiments make it possible to study whether different circumstances or conditions cause variations in consumer behaviour, with more confidence than simply observing consumer market choices. This means that policies, or interventions, can be targeted to the root of the behaviour. Experiments also make it possible to pre-test interventions, which would be costly to do in a 'real world' setting.

Types of behavioural experiments

The following are the main broad categories of Behavioural Experiments:

- Experiments using stylized settings, where participants are randomly allocated to different treatment groups, either in a laboratory, or online with a representative sample of the relevant population of consumers; or
- Experiments in real world settings, such as a randomised control trial (where consumers are randomly allocated to 'treatments' varying conditions under which they make decisions in real life)

Pros	Cons
Laboratory experiments	
• High degree of control over experimental environment • Possible to run more complex circumstances and conditions ('treatments') • Time constraints usually not as tight as other techniques e.g. online	• Participants are usually highly selected based at least in part on convenience (e.g. university students), so may not be representative of relevant consumers • Often the most stylized, meaning that conditions may not be realistic • Limited when exploring behaviour over time
Online experiments	
• Representative samples of targeted populations	• Treatments often need to be simpler than lab experiments

• Can be less costly to run than alternatives	• Less control over the environment compared to laboratory experiments, since participants do the tasks 'remotely' • Limited when exploring behaviour over time
Randomised control trials	
• Considered by HM Treasury's Magenta Book as the strongest evaluation design, since consumers are randomly allocated to different conditions under which they make real-life decisions • Possible to evaluate behaviour over time	• Can be costly or complex to run • Can be difficult to ensure control over the experiment environment compared to online or laboratory experiments • Potential ethical issues need to be taken into account

One alternative to the above techniques is natural experiments, in which one group of consumers (e.g. in one geographic region) faces different circumstances (e.g. owing to a policy change) compared to another group. For example, time of use tariffs are introduced in one geographic region and behaviour of consumers in this region is compared to behaviour in another region where time of use tariffs have not been introduced. This technique collects real-world data, and can track changes in behaviour. However, there is no control over the environment. It can, therefore, be difficult to distinguish between consumers who experience the intervention the researcher is interested in (the 'treatment' group), compared to consumers who experience the baseline (the 'control' group). It is also impossible to ensure that data is representative of the target group, since it is impossible to control whether the sample is representative of the target group. Further, actual policy change is required which can be costly without previous research on the possible benefits and costs of the policy.

Considerations

In order for a Behavioural Experiment to answer the questions, researchers need to carefully design the composition of the different groups involved, and the experiment itself to ensure that the findings can be claimed to reflect how people would behave outside the experiment. Factors that are important include:

- **Internal validity**: This means that the researcher can make 'like for like' comparisons between the different groups, e.g. making sure the different experimental groups are comparable in terms of their demographics, and that the experimental conditions of each group are carefully controlled.
- **External validity**: This means that the results of the experiment can be generalized, which is important when designing real-world interventions based on experimental results, e.g. making sure that the experiment captures the key issues that are fundamental to a consumer's decision-making.

- **Incentivisation**: It is considered good practice to offer incentives. These are actual monetary payments that participants keep at the end of the experiment. How much money participants earn in the experiment depends on the decisions they make within the experiment. Incentives are paid not for the purpose of recruiting participants, but instead to make the decisions in the experiment have real gains (and losses), and therefore decisions made in the experiment are realistic as possible.
- **Hawthorne effect**: Researchers need to be aware of the danger of participants' behaviour altering due to their awareness of being observed.

Outcomes

Behavioural Experiments allow policy makers to observe actual behaviour. This is different to the Stated Preference methods discussed above which ask consumers what they would do in a certain situation. Behavioural Experiments set-up a simulated environment in which consumers make actual choices. For example, their choice of electricity contract, whether they choose green energy tariffs over grey energy tariffs, or if they choose to contribute to the protection of a common pool resource such as a wetland. Behavioural Experiments can be used to test interventions prior to placing them in the field in order to understand what effect interventions will have on consumer behaviour.

Case studies

Encouraging management of inter-generational resources

Many long-term decisions involve inter-generational issues. Policy makers often seek ways to encourage people to consider the impact of their decisions on future generations. A behavioural experiment completed in 2015[19], looked at the use of intergenerational advice and contributions to a common resource (e.g. management of a wetland, giving to charity, reducing littering, reducing energy usage for environmental reasons). Participants within the experiment could choose to donate money to the management of a common pool resource. Participants would benefit from the resource whether they donated or not (i.e. the resource was a public good), and therefore the incentive is to free ride and not contribute. In one scenario participants received advice from people who had completed the experiment previously. This advice contained information on how to behave collaboratively with other participants in order to maintain the resource for the future. In the other setting no advice was provided. The researchers found that the provision of advice from one generation to another lead to greater contributions to the management of the resource. This messaging targeted collaborative behavioural drivers in long-term decision-making (where decisions today impact future generations). These insights are useful for understanding how to frame information when targeting long-term behavioural change.

Improving consumer understanding of energy bills

This study for European Commission Directorate General for Justice and Consumers (DG JUST) investigated whether the electricity market was

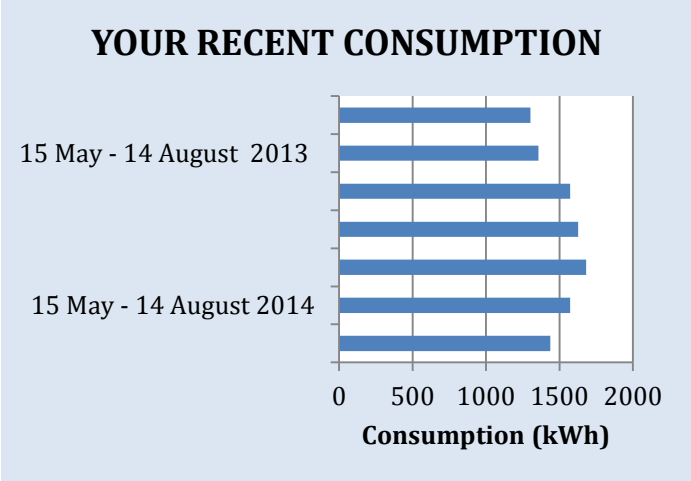
[19] Hillis, V., and M. Lubell. 2015. Breeding cooperation: cultural evolution in an intergenerational public goods experiment. Ecology and Society 20(2): 8

functioning well for consumers in the European Union and European Economic Area. One of the objectives of the study was to assess whether consumers had the tools to make informed, rational and empowered choices in the retail electricity market. As part of the study, London Economics designed and analysed online behavioural experiments investigating:

- The reasons that consumers stayed with their current tariffs, or switched to alternatives.
- Ways of presenting marketing materials that would help consumers understand promotions better, and make better choices.
- Ways of presenting billing information that would help consumers understand bills better.

The experiment was run among approximately 10,000 consumers, and tested a number of variants when presenting tariff information, including:

- Simple pricing versus complex pricing
- Presenting all information up-front versus 'dripping' it
- Standardising information so that tariffs can be compared easily in a 'side-by-side' comparison
- Presenting consumption history in a chart rather than a table
- Putting relevant information in an enlarged box, for ease of comparison



The behavioural experiments found that the use of a comparison box on the first page of the bill improves consumer understanding, presenting price in per kWh is easier for consumers to understand than more complex tiered pricing[20], and standardising information provision across tariffs helps consumers to better compare alternatives.

Qualitative research approaches to provide deep insights

a) Deliberative research

Overview

Deliberative research approaches offer an opportunity to understand how the views and opinions of members of the public change and develop when they are

[20] While consumers find kWh prices easier to understand, this must be considered in light of Demand Side Management and the use of Smart Tariffs, which have different prices for consumption at different times of day.

given the time, space and information to consider an issue or policy debate in real depth.

While traditional quantitative surveys and standard qualitative research methods are concerned with understanding people's 'top-of-mind' views given how much (or little) they already know about a subject, deliberative approaches seek to understand how members of the public respond to new information and points of view on a subject or topic about which they may know very little to begin with. They are particularly useful for issues involving complex trade-offs, where citizens' preferences may change in the light of a deeper understanding of the implications of their choice – for themselves, other groups or generations, or for society more broadly.

Deliberative approaches can take a range of forms, from Citizens' Juries and workshops, often involving between ten and thirty participants, through to Citizens' Summits which may involve thousands simultaneously. They can take the form of one-off events, or a series of activities, sometimes running over months or years. Regardless, there are some defining qualities that characterize deliberative research, and set it apart from other approaches:

- **Time:** Deliberative research gives participants time to talk, think and debate in real depth, issues that they might otherwise give little attention to. Whether a small scale workshop or a Citizens' Summit, deliberation rarely takes less than half a day, and Citizens' Juries often convene for two or three days (and reconvene further down the line to look again at an issue, or consider new developments).
- **Information:** Whist they typically involve an initial exercise to understand participants' pre-existing views and knowledge levels about the issue at hand, deliberative methodologies are characterized by structured approaches to building participants' knowledge and understanding of the topic. Information provision can take a number of forms including live presentations, Q&A evidence sessions, filmed content, and fact sheets.
    - As far as possible, this baseline information should reflect the 'undisputed facts' of an issue. Whilst some experts or campaigners may place more emphasis on some of the facts to support their particular prescription, the information provided to participants should be recognized as a fair and balanced account by the widest possible spectrum of experts and interest groups engaged with the topic being deliberated.
    - Information is usually prepared specifically for the deliberative process, with great care, attention, expertise and oversight applied to ensure that it is accessible and understandable to everyone who will be taking part in the research, regardless of their existing knowledge levels and intellectual capacity.
- **Balance:** The most worthwhile deliberative processes are concerned with topics that involve trade-offs. Deliberative approaches involve exposing participants to the fullest range of perspectives on what should be done. This involves presenting the case that proponents from across the spectrum of expert views make for particular policy prescriptions, setting

out the values and principles that they feel should be taken into account and why they support a particular course of action.
    - Whilst it is often valuable to have 'live' evidence sessions for these purposes, it is important to ensure that evidence from different sources is structured similarly, and that the presenters are of similar standing and experience, in order to avoid presentational effects from unduly swaying participants' views. Where a process involves multiple workshops, this may take the form of written or filmed inputs to ensure consistency.
- **Transparency of purpose:** Unlike much traditional public opinion research, where the purpose of the exercise may not be known to participants, deliberative approaches are characterized by a clear task or purpose that the participants are aware of from the start. Whether their role is to influence a decision, choose between options, or simply to inform a communications plan or campaign, participants in a deliberative process are 'insiders' – aware of what they are part of, how their views will be used, and what can and cannot be changed as a result of their deliberation.
- **Representativeness:** Participants in a deliberative event generally reflect the contours of the population more broadly in terms of age, gender, social class and geography, as well as wider characteristics relevant to the subject matter (for example, payment method, metered / non metered, behaviours / engagement with the market). Alongside this, there may be valid reasons to consider over-representing some groups whose voices might be of particular relevance or interest to the topic. This may be because a particular group disproportionately uses a service under consideration or will be more likely to be affected, or because they are a seldom-heard voice whose interest in an issue is often overlooked in mainstream debate. For example, rural consumers when considering undergrounding of cables in rural locations.

Techniques and methods that are used in deliberative research include:

- **Independent and group exercises:** Mixing activities between independent and group exercises are important to understand how perceptions change in a social context.
- **Revisiting activities:** A key part of deliberative research is understanding how perspectives change given time and information. Therefore, it is often important to revisit activities or discussion throughout the day to see how perspectives have changed (e.g. participants filling out identical questionnaires at the beginning and at the end of the workshop).
- **Pen portraits:** Pen portraits, case studies of people who may be impacted by a particular issue, can be used to help move participants past their perspective and consider and give weight to how a particular issue may affect others before they come to their final conclusions. This is an important part of moving participants from a 'personal' to a 'citizen' mind-set.
    - For example, when discussing how an organisation should prioritise its resources to best serve its customers, participants could be

presented with pen portraits of people from different backgrounds (e.g. age, ethnicity, SEG) or personal circumstances (e.g. disabilities, language barriers) to make them think about what is best for the organisations' customer base as a whole.

- **Chip allocation/participatory budgeting:** Chip allocation can be used as a way for participants to discuss and explain the value or weight they give to different characteristics. This can be performed at different stages throughout a workshop to understand how participant's perspectives change given information.
    - For example, in the case of a local council who wants to understand the priorities of their residents, participants could be tasked with allocating a certain amount of chips between the different services available.
- **Independent expert panel:** Delivering information to participants is an essential aspect of deliberative research. While this can be delivered by the researchers or a representative from the organisation, independent expert panels can be used in situations where establishing the neutrality and credibility of the information is particularly important. Furthermore, once the participants have come to their conclusion, this panel can be used to challenge the participants to make sure they have considered different aspects of the issue.

Pros	Cons
• Provides a deep level of insight into public views on an issue • Can be used to explore multiple complex areas and trade-offs • Provides the opportunity for stakeholders to attend and see the public engage with the discussion areas first hand • Can be filmed to help bring the findings to life • Can purposively recruit specific audiences (e.g. harder-to-reach customers) or run complementary qualitative research in parallel	• Time needed to develop materials – not suitable when urgent answer required • Qualitative approach – overall sample sizes are (usually) small and so findings should be treated as indicative of wider population only • Can be a significant cost outlay • Can exclude members of the public who might not be able to attend a workshop • As with all qualitative research it depends on skilled moderation to ensure that a minority of individuals do not influence the wider group • Unlike SP/RP methods, cannot be directly compared with costs or preferences for other goods / services and results can't be scaled up

Considerations

Organisations should consider the following when exploring deliberative methodologies:

- Because of the level of involvement and engagement, organisations should consider feeding back to participants as and when business decisions have been made based on their input. At the very least, sending a summary report of the research to those who take part will show that they have been listened to.
- The success of deliberative research depends on the quality of the materials used to stimulate discussion. Commissioning organisations will need to factor in sufficient internal time and resource (in collaboration with the research partner) to ensure that these are fit for purpose, and ensure that appropriate internal stakeholders are able to feed into their development.
- The minimum amount of time required to deliver a successful deliberative project would be 6-8 weeks.

Outcomes

Deliberative research can tell an organisation **what** its customers want, and **why**. As the findings from deliberative research should reflect the considered informed views of their customers, organisations can use these to inform business planning and strategy development when the customer perspective is required. It is particularly useful in instances where a trade-off is required, or there are a number of different options under consideration.

Case study: Thames Water

Since 2015, BritainThinks has worked with Thames Water to deliver an extensive qualitative research programme as part of its on-going engagement with customers. The purpose of this research was to lay the foundations for Thames Water's Business Planning activities for the period 2020-2025.

This endeavour posed two inter-related challenges:

- Typically, water is a low-interest and low-engagement topic for consumers. It was important to ensure that the research was engaging to explore customers' spontaneous responses in detail, and evidence that Thames Water's planning activity truly reflected the customer perspective.
- It was necessary to empower customers with knowledge so that they could comment on a range of complex issues in a meaningful way and become partners in the planning process. This meant going beyond their existing perceptions and levels of knowledge to become 'informed citizens'.

Initially, the research programme comprised a series of reconvened deliberative workshops with household and non-household customers (followed by targeted depth interviews and mini groups with vulnerable audiences). These sessions were carefully designed to incorporate a range of different exercises in order to overcome these two challenges and touched over 325 customers in total.

This foundation research provided Thames Water with a thorough understanding of how people view their water / wastewater service and what their needs and priorities are now and in the future.

BritainThinks is now convening a series of deliberative workshops with Thames Water customers to explore issues such as water resource management planning and intergenerational fairness. Each workshop consists of a range of presentations and activities (including quizzes, chip allocation and group exercises) to help bring the subject matter to life and enable customers to come to informed decisions about the issues being discussed.

Further information about deliberative research
http://www.involve.org.uk/wp-content/uploads/2011/03/Deliberative-public-engagement-nine-principles.pdf
http://www.gov.scot/resource/doc/175356/0091392.pdf

b) Qualitative panels

Overview
A qualitative panel is a group of participants who have been recruited to take part in on-going research over time. These panels are often bespoke to a particular organisation and are very flexible, with organisations able to quickly consult the panel as and when a research question arises.

In standard qualitative research with the public, 'fresh' participants i.e. those who have not conducted research into the same or similar topic, are recruited. In doing so, researchers guard against those who have greater familiarity with a particular issue or organisation skewing the results. For example, if conducting focus groups into the public's perceptions of the energy industry, those who have conducted research on a similar topic in the past, would be excluded from taking part in the research, as we would expect their perspective to be more nuanced than other members of the general public.

Research using a qualitative panel differs from this approach, in that panel members are valued and sought *because* the participants have greater familiarity with a particular organisation or issue than other members of the public. They will offer a more informed and nuanced position, and this, combined with the ability to go back to participants with further research, mean that these panels can be an excellent resource for an organisation to get considered feedback from their customers. These panels, however, take time and energy to create and maintain.

Pros	Cons
• Participants hold a more informed, familiar or nuanced position, and therefore can	• Findings from this research cannot be generalised more to the wider public

give more developed and thought through answers than 'fresh' participants • Research can be conducted in person, convening focus groups or interviews, or remotely, with participants conducting task remotely using an online platform • Qualitative panels, particularly online panels, can be quickly activated for fast turnaround research	• Due to participants disengaging and natural attrition, panels need to be closely maintained even outside of research periods to ensure that they can be activated when needed (e.g. regular communication or activities & replenishing participants) • Research fatigue may mean that the quality of participants' responses (e.g. detail, creativity) diminish over time. Refreshing the panel members and varying the activities and research topic can help to avoid this

Considerations

- When expecting participants to commit to a long-term study, it is important that a well thought-out strategic research programme is designed and put in place in order to avoid the panel being used tactically and reactively.
- An alternative to a qualitative panel would be to reconvene participants from an original research session to explore how views have shifted over time; this can often be built into the research design of deliberative approaches.
- Because findings from qualitative panels cannot usually be generalised more to the wider public, additional research may be required with 'fresh' participants.

Outcomes

Qualitative panels can be ideal for organisations to:

- Conduct research on a complex issue that requires a certain level of familiarity or understanding.
- Conduct on-going research on a particular issues as it develops (e.g. at different stages of policy development).
- Conduct, ad hoc, quick turnaround research as and when a research question arises.

Case Study: Ofgem Consumer First Panel[21]

To carry out its functions, Ofgem requires an understanding of the needs, expectations and behaviour of energy consumers. Since 2008, the Consumer First Panel has played a major role in supporting the development of this

[21] https://www.ofgem.gov.uk/consumers/consumer-research/other-research-household-consumers

understanding. The aim of the Panel is to generate insight from ordinary energy consumers to feed into key policy issues.

To date, the Panel has deliberated on a range of issues, including the affordability of household energy, switching suppliers for customers with debt, and Distribution Network Operators. Since its inception the Panel has consisted of around 80-100 consumers, split across a number of locations in Great Britain who have convened several times over the course of a year.

3. Considerations

In addition to the specifics outlined above, there are some more general factors that decision makers will need to take into consideration when choosing an approach:

a) Bias

The effectiveness of different research techniques will be influenced by various biases (for example: presentation of information; timing; over-confidence; social desirability etc.) that will need to be taken into account when thinking about the research approach. Good research agencies will be aware of such biases and design approaches accordingly to reduce them as far as possible.

b) Piloting

Piloting a primary research approach amongst a small group of customers can reassure practitioners that it is fit for purpose – i.e. that participants are able to respond to the research questions in the way they were intended. This could take the form of cognitive interviews, whereby an individual completes a draft survey and feeds back on each question, or cognitive groups whereby discussion materials for qualitative research is tested for clarity and comprehension. Quantitative methods such as Stated Preference Surveys and Behavioural Experiments should also be piloted prior to main-stage fieldwork. Alternatively, surveys can be piloted using a 'soft launch' whereby the first c.100 respondents are asked at the end of the survey if there was anything they didn't understand.

c) Stakeholder engagement

Different research approaches offer different opportunities for stakeholders to engage with customers and see their responses first-hand, with qualitative approaches allowing stakeholders to attend research events in person or watch films / vox pops from sessions. This can be invaluable in helping to bring research to life and reassure stakeholders of its credibility.

d) Audience type

The research approaches outlined in this paper are best suited to domestic customers. Engaging with **professional or business audiences** is possible (for

example, Thames Water conducted deliberative workshops with their business customers); however this cohort brings its own issues (for example, it can be problematic to get through gatekeepers to the most appropriate individual, business customers are often time poor and may be harder to recruit to take part in research). Should organisations wish to bring in the views of such audiences, additional cost and time should be factored in to ensure that a representative sample is achieved

e) Value for money and cost implications

High quality primary research design, sample and analysis cannot be done on the cheap. The following chart shows *indicative price ranges* (from simple/small scale to complex/large scale) for the approaches discussed:

Research Approach	**Indicative cost (August 2016)**
Stated preference	£30,000-£120,000
Travel cost methods	£20,000-£50,000
Behavioural experiments	£40,000-£120,000
Deliberative	£20,000-£100,000
Online panels	From £15,000 per wave

The cost of quantitative techniques vary depending on the complexity of the issue to be assessed, the sample group included in the research and how well the research question is defined prior to the design of the survey or experiment. If the research required a sample that was representative of the UK population then at the lower end of the price range it would be possible to conduct a study with 1,000 to 1,500 people, but this would depend on the complexity of the survey design. As the sample becomes more specific and includes bespoke and harder to reach populations, the cost of the sample increases as a proportion of the total budget. It is also possible to use companies' customers for this type of research as well, or instead of, market research panels. Similarly, the number and size of sessions can impact on the cost of qualitative approaches – at the lower end of the price range you would be able to conduct 2 or 3 small (16 people) half day workshops.

f) Timing

Likewise, none of the approaches detailed in this paper can be completed quickly if they are to be done to a standard that holds up to scrutiny. Ensuring the quality of quantitative or qualitative sample is key to the quality of the results, and sufficient time is also needed for analysis purposes.

The table below shows the *minimum time* that should be allowed to complete a project using the different techniques. These timings would include set up and design, fieldwork, analysis, and reporting.

Research Approach	Time needed
Stated preference	6-8 weeks (assumes online panel used)
Travel cost methods	6-8 weeks
Behavioural experiments	7-9 weeks
Deliberative	6-8 weeks
Online panels	2-4 weeks to build panel

g) Comparability

Finally, when considering an approach, organisations may wish to consider how and if the results can be compared (to other internal studies or to previous research or to other companies). Changes in design may mean that results are no longer directly comparable; however, a degree of flexibility may be required to ensure that research approaches take into account specific issues, for example, audience type or location.

4. Conclusions

The quantitative and qualitative research approaches discussed in this paper each offer decision-makers the opportunity to explore the attitudes and / or likely behaviours of consumers and citizens in relation to long-term complex issues. These techniques can be used to complement other stakeholder and public consultation work as explored in Sustainability First's New-Pin 2016 discussion paper '**Consumer, citizen and stakeholder engagement and capacity building in the energy and water sectors**'. The primary research approaches discussed above (Stated and Revealed Preference, Behavioural Experiments and deliberative research) ensure that the views of members of the general public, who may be unlikely to engage in formal consultations and challenge groups, can to some extent be factored in when businesses are in the process of making decisions about these issues. The limitations that apply to all market research of course apply (for example, sample representativeness; budget/time constraints). As discussed in this paper, no one technique will provide all the answers. However, when used appropriately the research methodologies which this paper describes can be helpful in enabling decision makers to more confidently understand and therefore serve the long term public interest.

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Behavioural experiments

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Study on the impact of the energy label – and potential changes to it – on consumer understanding and on purchase decisions (January 2015) – a pan-European online and field experiment for the European Commission

General Insurance add-ons: Experimental consumer research report (March 2014) – a behavioural experiment for the Financial Conduct Authority.

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Deliberative research / panels

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