ENERGY CONSUMERS AUSTRALIA

Power Shift

FINAL REPORT

February 2020

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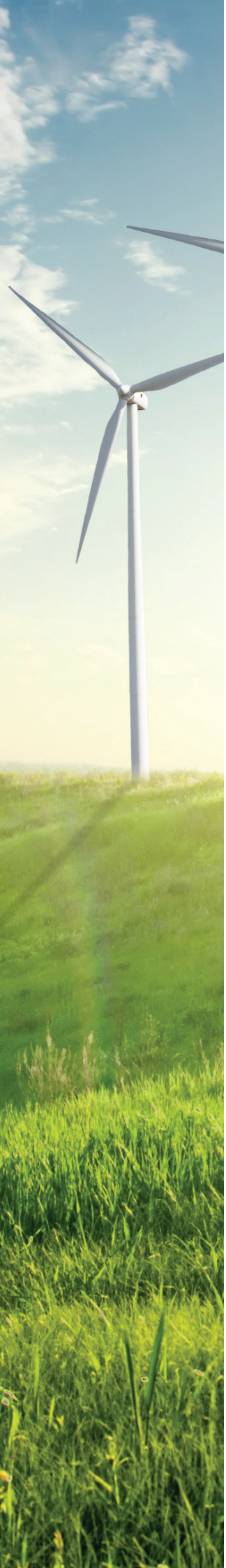

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Foreword

Power Shift is a body of research providing evidence about how to design better targeted, more effective, and innovative energy management services and programs that will enhance the ability of consumers to manage their energy use and costs.

Power Shift demonstrates that power needs to be in the hands of consumers so they choose, through their own actions, to take control over their energy use and costs. If energy use and costs cannot be managed, people's health, wellbeing and ability to fully participate in the community are at risk. But consumers face barriers to managing their energy use, including in the poor quality of Australian housing. The impacts can be particularly significant for low-income or vulnerable consumers.

To help address those barriers, we mined the rich evidence base built through the Australian Government's Low-Income Energy Efficiency Program (LIEEP), which engaged with over 20,000 households from 2016 to 2019, and commissioned additional new research.

At the highest level, the lessons for policymakers, regulators and industry can be distilled into three core findings.

First, we need to meet people where they are – developing information, tools and assistance that suit their circumstances and lifestyle, giving them relevant options for how to manage their energy use. This is a long-overdue shift from the old world, where the main interaction with the energy company was a quarterly paper bill, and where understanding how much energy different appliances in the home were using (and costing) was guesswork, to the new world of energy choices tailored to household needs.

Second, we need to design for diversity– we will need a range of choices in how people manage energy production, storage and use, across a range of climate zones, energy options and potential uptake of new energy technologies, including generation, storage, electric vehicles and home energy automation.

And finally, we need to build and deepen trust. Consumers are telling us - in our Energy Consumer Sentiment Survey and when we meet with them in their communities - that they do not have confidence that the energy market is working in their interests. We have a unique and important opportunity right now to work with consumer and community

organisations, industry, government and regulators to re-build people's confidence and trust. Without it, we will not realise the potential benefits of people participating in an optimised and affordable energy system.

Power Shift has provided us with new evidence to support change, based on the lived experience of consumers and a deeper understanding of the drivers of their behaviour and choices. As this report demonstrates, it has profoundly transformed how we advocate for affordable, individualised energy services for everyone – not just people on low incomes who were the focus of LIEEP. Power Shift has uncovered significant opportunities for consumers to participate in energy markets in a way that works for them in a continually transforming energy system.

As energy prices have gone up and affordability has become a major issue for households and small businesses across Australia, the imperative to give people the information, tools and services to control their energy use and costs has only become stronger.

Power Shift was funded through an Australian Government grant to support our research over three years from July 2016. We would like to thank the Department of the Environment and Energy for the opportunity to undertake the Power Shift research.

I would like to particularly acknowledge the contributions of Departmental officers Ginny Hoy, Kevin Chadwick, Sarea Coates and Veronica Westacott, with whom we worked closely over the time of Power Shift, and who have been valued colleagues through the project. I would also like to thank Department executives Rachel Parry and James White, who oversaw Power Shift and whose counsel helped us bring the project to a successful landing.

We also acknowledge the thousands of consumers who participated in all the projects detailed in this report, and our research partners, without whose commitment Power Shift would not have been the outstanding success that it has been.

Rosemary Sinclair AM
Chief Executive Officer

SECTION ONE:
THE POWER SHIFT JOURNEY

A. Power Shift transformed our understanding of household decision-making

Energy Consumers Australia's Power Shift research – delivered under a $1.8 million three-year grant from the Australian Government - represents a ground-breaking and transformative shift in understanding households' role in the energy market.

Without the energy they need at an affordable cost, people cannot live in healthy and comfortable homes, and our small businesses cannot be competitive. This puts people's health and wellbeing at risk, as well as undermining social and economic inclusion, national productivity and living standards.

There are unique challenges associated with the diversity of the Australian context. Our continent has multiple climate zones, there are wide differences in degrees of urbanisation from inner city to remote, households range from the wealthy to those highly vulnerable to cost-of-living pressures, and there are varying levels of competition between energy suppliers across states and territories.

Against the background of these challenges, Power Shift has changed the way Energy Consumers Australia understands how consumers use and make decisions about energy and provided a robust and persuasive evidence base that demonstrates how we might address the diversity that exists.

Power Shift's longer-term objective can be expressed in simple terms:

> That people are confident that the actions they take will make their home comfortable while having control over their energy bills.

That goal was simple but remains an aspiration – there is substantial cultural and market change required to achieve it.

Power Shift has shown that while people value highly the *outcome* of their energy use (light, heat, entertainment, comfort), communication with them about energy is primarily limited to 'cents per kilowatt'.

Power Shift has also demonstrated that people make decisions about the energy they need in different ways. The sector's focus on the 'bill-payer' as the economic agent ignores that the use of energy in the home is the result of a series of lifestyle choices made by adults and children, in the absence of any meaningful or useful information that links these decisions to energy costs.

As a result, policies and measures to date have focussed more narrowly on people's decisions in choosing an energy supplier rather than developing a deeper understanding of people's energy needs and usage patterns.

Power Shift's research underlined the critical role of inefficient housing and appliances in negating even the most energy efficient behaviours. When appliances are intensively using power and homes are leaking warm or cool air, they have a direct and material impact not only on energy costs, but energy rationing impacts on people's health and wellbeing.

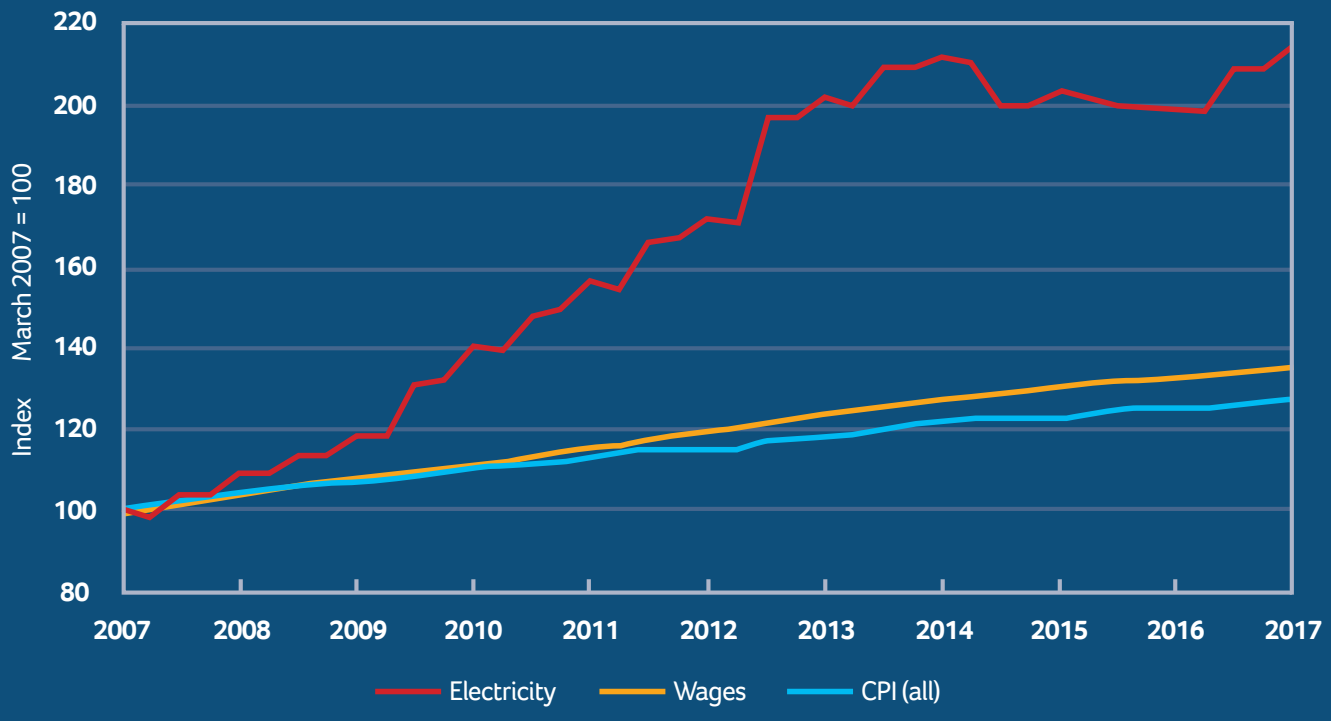
The overarching lesson and implication of the Power Shift research is that there are real opportunities to improve the design and development of measures to assist people in managing their energy costs.

These opportunities would see an energy market evolve that meets people's expectations. The future energy market needs to go beyond a focus on reactive decision-making informed only by a monthly or quarterly energy bill (in arrears) and instead provides a range of rewards, information and tools, and a framework for active decision-making that is based on the opportunity and motivation for unlocking the potential for people's flexibility in energy use, in real-time, and channels for engagement and communication.

The need for a Power Shift

Electricity prices over the past decade have grown much faster than other costs of living and wages, thereby intensifying pressure on household budgets.

FIGURE 1: CPI FOR ELECTRICITY COMPARED WITH OTHER SECTORS AND WAGE GROWTH



Source: ABS, Consumer Price Index 6401.0 and ABS, Wages Price index 6345.0, Australia

The poor energy performance of most Australian homes means too many people are living in homes that are damp, and/or too cold in winter and too hot in summer.

Whether to save money or reduce emissions, consumers are already taking action to manage their energy use. People are switching off appliances and lights when they're not in use, using off-peak hot water, as well as buying more energy efficient appliances, and installing solar panels.

At the same time people are telling us in the Energy Consumer Sentiment Survey that they are not satisfied with the value for money of electricity, and that they lack enough easily understood information and useful tools to achieve better outcomes from their decisions.

In the current energy market where mass-market solutions have been implemented - by governments, regulators and industry - to help people manage their energy needs, they have not helped everyone to the same degree.

Instead in the future `handcrafted' solutions, which are enabled by new technologies and applications, have the potential to empower people to manage their energy use and unlock greater flexibility. This will underpin both sustainable gains in affordability and a more optimised energy system.

Power Shift in a transforming energy market

Power Shift's research not only points us to empowering people as consumers in today's energy market but also how we can assist them in a future energy system enabled by the emergence of new technologies and services.

What have been termed the '3 D's' – decentralisation, digitisation and decarbonisation – are fundamentally transforming energy markets.

The decentralisation of the electricity system is well underway, with over two million households with solar panels on their roof, and government policies continuing to encourage investment by households in generation and storage technologies. But there is a need to coordinate and leverage that generation capacity, signifying new ways in which households will interact with the energy market and be rewarded for their behaviour.

We are seeing the emergence of new connected digital technologies to help manage energy use and bills – lighting and appliances that connect with each other, and apps or services that help people use energy at the cheapest time, and participate in demand reduction at times when it matters the most for keeping the power on.

The challenge of reducing energy emissions affects not just the way energy is generated, but also the way we build and maintain our houses and appliances.

People are being asked to think about their energy use in new ways – to monitor it at different times, to understand the impact of individual appliances, to consider placing the appliances in their homes under smart controls able to be activated automatically, and to enter into energy deals that might offer incentives to use less at certain times. Consumer protection, privacy and just and fair terms are all issues that will need to be addressed and shaped into fit-for-purpose frameworks.

Innovative services and technology have the potential to deliver better energy management to households, but people must be treated as partners in the transforming energy market.

This also means working together to ensure that people are resilient in their energy use behaviours, in an energy system where there is a much more need to dynamically balance supply with demand. With greater resilience, there is an opportunity to minimise the need for costly, additional investment in long-lived generation assets and the 'poles and wires' that make up the electricity network.

There are some people in our community who cannot afford the energy they need, while others are potentially able to be rewarded for using no more than the energy they need – potentially using less or changing when they use energy. For the community to be willing to adapt and change how they use energy, it is essential that we do not widen the energy divide – a divide that leaves some people behind without the energy they need while others are able to access and benefit from technology and services that make their energy more affordable.

B. Power Shift findings

The Power Shift project can inform a step-change for energy decision-makers and policymakers. The findings have changed the way we advocate for Australian households, to a broader focus on energy management rather than using less (energy efficiency). We also now know that no amount of energy information, tools and services will adequately help vulnerable people living in poor-quality homes that leak heat in winter and cannot be cooled in summer to afford the energy they need.

The key findings of Power Shift, drawn from the body of evidence gathered over the life of the project, are summarised below.

Information should be tailored

To be effective, information must be tailored to people's circumstances and lifestyle. There is no one size fits all solution.

All households, including those that are vulnerable to cost-of-living pressures, have diverse needs and preferences in relation to energy, depending on their personal circumstances and lifestyle.

- A retired couple who spend most of their time in their home depend on that being a comfortable space, but their fixed income will make them acutely aware of the cost of energy and stressed about their bills.
- A young tenant may be able to rely on their workplace to provide a comfortable living space during the daytime, but use cheap, high-cost appliances to heat their home at night.
- A person with a chronic illness who requires a constant temperature to manage their symptoms might eat, live and sleep in one room so they can maintain it at that temperature.
- A family with young children may have limited capacity to use energy differently at bath and bedtime, but is happy to look online for advice on energy after the kids have gone to bed.

People are looking for information, tools and services that meet *their* needs, and suit the way they live.

Consumers can and do change energy use

People are already trying to manage their energy costs but are not confident they're getting the right tools and information. Messages and assistance that are targeted and personalised to households are far more likely to be effective. Communication that focuses on their specific goals works well: `If I do this, I save that'.

The tone of communication is important. It needs to be helpful and supportive, not dictatorial. Where possible, a two-way conversation with households achieves results. However, a good understanding of the audience is the critical step in communicating in a meaningful way.

Use a trusted voice to provide information and tools

People are confident in their ability to make good decisions about their energy use, but lack enough easily understood information and useful tools.

With a lack of trust that the market is working in their interests, people are looking for trusted channels to deliver information and tools that they can rely on to manage their energy use and costs. There are trusted voices - such as community organisations – that have proven to be effective as a way of engaging with households.

Energy is critical to health and wellbeing

Too little heating or cooling can endanger health and also result in much greater-than-expected levels of social and economic exclusion.

Improved thermal comfort is the single most significant health and wellbeing benefit that helps reduce mortality and chronic disease.

Taking the multiple benefits framework developed by the International Energy Agency[1], Power Shift has developed a framework that is uniquely adapted to the Australian context to measure and identify these wider consequences on health and wellbeing from improved energy management.

There are wider benefits

We have historically measured the impact of energy efficiency programs on how much energy was saved, whether the bill reduced, or whether there were fewer emissions.

Power Shift has made clear that we have under-estimated the benefits – there is robust and persuasive evidence indicating the significant health and wellbeing impacts from energy efficiency could in fact be greater than energy savings.

Our *Multiple Impacts of Energy Efficiency framework provides a guide to policymakers and industry on how they might measure all the impacts.*

1 International Energy Agency, *Capturing the Multiple Benefits of Energy Efficiency*, 2014, https://www.iea.org/publications/freepublications/publication/Multiple_Benefits_of_Energy_Efficiency.pdf

C. Power Shift has changed our advocacy

As transformative research, Power Shift has changed the way we understand consumers.

It has shown us that helping households manage their energy bills and usage is a necessary step in preparing Australian households for the new energy future. People need better tools, information and services to manage the new devices and appliances emerging in the energy market.

Accordingly, Energy Consumers Australia has embedded Power Shift into our advocacy for households – leading to a paradigm shift where consumers are at the centre of policy, program and product design.

We see better consumer outcomes relying on three principles:

- **affordability** – customers are paying no more than they need
- **individualised** – customers are able to access information and services on their terms
- **optimised** – consumers are confident that the market is working in their interests, where system decisions include rewarding consumers and their assets.

FIGURE 2: ENERGY CONSUMERS AUSTRALIA ADVOCACY PRINCIPLES

The Power Shift audience

At the beginning of Power Shift, our target audience was government and industry, to help them design programs and services that delivered better outcomes for households, particularly vulnerable households.

Our research has reaffirmed that was the right approach.

Households are ready and willing to engage, but they need more useful information and more effective assistance to allow people to understand how they need to change their habits in order to have more control over their energy bills and usage.

Power Shift research has underlined the diversity of households – that households can have different motivations, abilities and opportunities.

To develop effective information, tools and services, government and industry must therefore better understand households' motivations, abilities and opportunities, and communicate with households accordingly.

We identified three main audiences for Power Shift's research.

TABLE 1: POWER SHIFT AUDIENCES

Organisations talking to customers directly	Government officials and agencies running programs to encourage energy efficiency/ conservation; reduce emissions; greater access to solar and batteries; and developing measures to assist consumers make decisions. Energy retailers and networks developing energy efficiency programs, and/or considering new energy management products and services. Consumer and community organisations who are influencing the design of policies, programs and products. Other service providers – such as financial counsellors and welfare agencies - that are providing information and assistance to energy consumers to help them manage their energy. New intermediaries (aggregators, microgrids, Virtual Power Plants (VPP), embedded networks).
Organisations informing policy and regulatory settings	Market bodies Ombudsmen Other regulators
Organisations driving new ways of thinking about energy management tools and services (change agents)	Researchers OECD Behavioural Insights International Energy Agency (IEA) New technology companies

D. Power Shift activities and outputs

As outlined in Schedule 2 of the funding agreement, Energy Consumers Australia undertook research through the Power Shift grant.

We identified two outcomes, with the project successfully delivering on both.

The first was to improve our evidence-based understanding of what really works in supporting vulnerable[2] consumers to manage their energy bills (the research outcome).

Section 2 in this report provides more detail on the body of research that analyses the drivers and benefits of people changing their energy use behaviours.

The second project outcome was to identify opportunities for market-led solutions and other initiatives to support vulnerable consumers to manage their energy bills (the empowering consumers outcome).

Section 3 in this report provides frameworks for developing opportunities to empower people to manage their energy use, both through market-led solutions and government initiatives. These focus on delivering fit-for-purpose measures in the context of the energy choices available to consumers, and the motivations, barriers and opportunities they experience.

As a research project, Power Shift was necessarily adaptive – the research findings and recommendations informed the development of further work and short-term priorities. Our research and activities were also influenced by the substantive and innovative complementary research being undertaken around customer behaviour[3], as well as major government and regulatory reviews that occurred during the project.

Energy Consumers Australia not only undertook the work required under the conditions of the funding agreement but has integrated the research into our own advocacy strategy and built links with key researchers, governments, behavioural insights units and other organisations in Australia and internationally.

The Project Steering Committee, comprising Energy Consumers Australia and the Department of the Environment and Energy, approved the Power Shift work program each year, which outlined in detail the proposed project phase goals (activities and outputs). We reported regularly to the Department of the Environment and Energy, providing biannual reports that outlined the work done over the reporting period, tracking progress against the work program, and flagging any changes.

Table 2 summarises the major outputs against our obligations in the funding agreement. Copies of all the reports are published on the Power Shift page on Energy Consumers Australia's website[4].

2 Vulnerable is used here as a term to include low-income households and those households that could be considered to be at risk of cost-of-living pressures or financial stress, with energy bills persistently making up a significant proportion of their budget.
3 Appendix A outlines the research we found particularly influential.
4 *https://energyconsumersaustralia.com.au/projects/power-shift/*

TABLE 2: POWER SHIFT ACTIVITIES AND OUTPUTS

ACTIVITIES	OUTPUTS
Review the findings and data from the Low-Income Energy Efficiency Program (LIEEP) projects to improve our evidence-based understanding of what really works in supporting vulnerable consumers to manage their bills and related consumer behaviour and opportunities for market-led solutions	• *Driving Change Report* • *Multiple Impacts of Energy Efficiency Report* • *Consumer Services in Electricity Markets Report* • *Effectiveness of Energy Efficiency Interventions in Advanced Economies* • *Power Shift Final Report*
Improve our understanding of related consumers' attitudes and experiences in energy markets, including through the findings of ECA's *Energy Consumer Sentiment Survey* and complementary behavioural research	• *Energy Consumer Sentiment Survey findings on consumer behavior and activity* • *Consumer Sentiment and Behaviour Report*

Use the findings from LIEEP to assist the development of a best practice voluntary guideline, information and related toolkits for service providers working with vulnerable consumers (NEPP Measure 4), and work closely with market service providers and stakeholders to support effective implementation	• *Empowering Low Income Households Report*
	• *The Supporting Households Framework Report*
	• Toolkits and related information products in collaboration with
	  • Financial Counselling Australia
	  • Indigenous Consumer Assistance Network
	  • Council of the Ageing
	  • Tenants Victoria, Shelter Tasmania, Better Renting
	• *Scoping an effective voluntary industry guideline for helping households manage their energy bills Report*
	• *Housing Summit* 2018 and *Housing Summit 2018 Background Paper*

Support the ongoing work of LIEEP researchers (collectively known as the Group of Energy Efficiency Researchers Australia (GEER)), to ensure their ongoing input from LIEEP and related findings into market led solutions to support services for vulnerable consumers	• GEER workshops and symposia • *Improving Residential Energy Efficiency Conferences* 2017 and 2019
Engage wider researchers and stakeholders in these findings and undertake complementary research to contribute to wider efforts to 'make choice easier' for all consumers (NEPP Measure 3).	• *A Policymakers Guide to the Supporting Households Framework* • Foresighting Forum 2018 : *Take Charge – Shifting power to consumers in the using, making and trading of energy* • *Innovation in Energy Services Workshops* with international speakers Dr Fereidoon Sioshansi (Menlo Economics) and Dr Ahmad Faruqui (The Brattle Group) • Engagement with ARENA, AEMO, energy companies and electricity distribution businesses on demand response programs • Engagement with COAG Energy Council, State and Territory Governments on energy efficiency schemes and sustainability programs, and improving housing energy performance • Presentations to the International Energy Agency and the OECD

E. Power Shift outcomes and impacts

In seeking to have a longer-term impact on people's ability to manage their energy use and control their bills, so they can live in comfortable homes, it is important at this stage of our Power Shift work to reflect on the outcomes and impacts so far. Thinking about what we have learnt about the opportunities for change (the highlights and break-throughs) and the difficulties in bringing about change will inform how we shape the next stage of our Power Shift, as part of Energy Consumers Australia's ongoing work program.

Stakeholders actioning Power Shift research

The first achievement was that government and industry started tailoring their programs and products in response to Power Shift's research.

We found that many stakeholders were open and receptive to the evidence being made available through Power Shift and to apply it in their work.

The research was more influential when it was able to provide insights into meeting an immediate need - improving the design of an energy efficiency program, understanding how best to talk to consumers, or informing the design of tools to assist consumers and community workers.

Power Shift's frameworks have been used by many stakeholders, with examples including:

- the Australian Government Department of the Environment and Energy to inform the review and design of policies;
    - in response to the Finkel Review recommendation 6.3 aimed at improving access for vulnerable households to energy efficiency services and distributed energy resources;
    - relating to the Trajectory for Low Energy Homes;
- the Victorian Government in designing and developing energy efficiency programs for low-income households;
- the NSW Office of Environment and Heritage's development of energy efficiency projects;
- the Essential Services Commission Victoria in its consideration of new information and assistance measures;
- the Consumer Policy Research Centre in the design of information resources for community and welfare workers; and
- an important input to the development of the Queensland Government's energy efficiency strategy.

Energy companies were interested where they were already seeking to understand their customers better – for example, we consulted with a major retailer on the development of a product providing households with better feedback. Energy companies' opportunity to innovate in this space tended to be limited to where there was smart meter data – there remains work to be done to encourage those stakeholders to prioritise and dedicate resources to building the capability of their customers to manage their energy. Section 3 discusses that in more detail.

Events such as the Foresighting Forum 2018, briefings and presentations, and our webinars helped inform the sector of the research findings. But an important project learning was that engaging strategic communications expertise is helpful in engaging more systematically with stakeholders, to help develop strategies to cut through.

Energy Consumers Australia will continue to communicate the Power Shift research findings as part of its advocacy strategy and have included this in our current work plan and future business planning.

We also identified an opportunity to share the learnings and lessons of government programs more effectively – through Power Shift, we often played the role of connecting program managers in different jurisdictions or alerting them to work underway.

Networks such as GEER provide a platform for researchers to share information and learnings. We think there would be value in a similar platform at the government level, to help officials – particularly those that might sit in agencies outside COAG Energy Council processes - that have been tasked with program and policy delivery to share information and learnings.

Power Shift was centred on energy use, but we now have a framework that helps with a range of energy decisions. Grid modernisation is supported by providing households with better tools to manage their growth, as that will unlock flexibility. Achieving the level of interoperability required to knit devices and appliances together requires a level of coordination around standards.

Dialogue on the research

We spoke widely in Australia and internationally on the research findings, and what we were learning about consumer behaviour and decision-making:

- convening webinars on the release of each of the major frameworks;
- presenting the research to a range of industry and academic events;

FORESIGHTING FORUM 2018

Energy Consumers Australia convenes a Foresighting Forum each year to bring the whole energy sector together to work collaboratively on consumer issues, from the consumers' perspective.

The 2018 Forum theme was *Take charge: Shifting power to consumers in the using, making and trading of energy.*

Power Shift's research was at the heart of the Forum agenda, which focused on the immediate challenge of affordability for residential and small business consumers, while encouraging the participants and the sector more broadly to rethink the frameworks it currently uses to guide longer-term reform.

The Forum gathered over 130 consumer advocates, government and industry, with 41 speakers leading discussions about the issues which require attention in the interests of residential and small business consumers.

Discussions focused on the challenges facing consumers, as well as how the next generation of tools and services will help consumers manage their energy use.

The Forum provided a platform for the sector to consider consumer needs and behaviour and encourage government and industry to put those needs at the centre of their strategies.

- referencing Power Shift learnings in our briefings to industry, including at the Board and CEO level;
- tailored individual briefings to multiple stakeholders, including New South Wales, Queensland and Victorian Government officials, Australian Renewable Energy Agency, Australian Energy Regulator, Australian Energy Market Operator;
- presentations to consumer and community groups; and
- presentations at the OECD and the International Energy Agency.

We found that stakeholders were open to new ways of thinking about consumers. There has been a long-standing assumption in this market that consumers are apathetic and disengaged – Power Shift has definitively demonstrated that consumers are ready to participate, but that we need to deliver that engagement in a way that suits the way they live.

Linking energy, housing and health

The evidence base built through Power Shift, and supported by other complementary research, made clear the links between energy, housing and health.

It also highlighted the circumstances of people in 'silent' hardship – where a consumer is managing to pay their energy bills but is rationing their energy use to an unhealthy level. Older households, who are price sensitive and very receptive to messages about being frugal and avoiding 'waste', are particularly at risk. Our regulatory regime relies heavily on financial hardship as the primary indicator of vulnerability – those people are for the most part invisible.

Acting on those findings, Energy Consumers Australia identified three areas where the evidence base indicated how the experience of vulnerable consumers could be improved through helping them manage their energy bills.

Avoiding 'silent' hardship

There is a need to ensure that programs or services that are intended to encourage energy conservation or emissions reduction actively consider the potential health and wellbeing impacts on households, to ensure that they are not inadvertently encouraging people into silent hardship.

The learnings from LIEEP and complementary research demonstrated how particular households (the elderly, the ill) were particularly vulnerable.

We found stakeholders to be responsive to that risk but are conscious that it is a message that will need to be repeated, particularly when a program's benefit is not defined in terms of the customer – for example, the need to reduce peak demand or reduce CO2 emissions.

Section 3 outlines a potential strategy to mitigate that risk, by encouraging energy companies to be more proactive in identifying households that are rationing their energy use to an unsafe level, including the potential for the strategy to be actioned through The Energy Charter.[5]

5 Information on The Energy Charter is available on the website *https://www.theenergycharter.com.au/*

Housing performance is critical

The second area was to highlight the integral role of the energy performance standards of housing, which includes fixed appliances, in household health and wellbeing.

The LIEEP projects underlined the impact of poorly designed housing on household health and well-being, as well as their energy bills.

We saw that the Australian Government-led *Trajectory for Low Carbon Homes* process offered a real opportunity to improve energy performance standards for residential housing.

We knew that only a few consumers have been actively engaged in building standards codes, and that previous attempts to improve standards had been undermined by claims that consumers didn't care or weren't asking for energy efficient houses.

To ensure the voice of the consumer was heard by COAG Energy Council, we convened a Housing Summit in September 2018, drawing together nearly 100 stakeholders from consumer and community organisations, government and industry. Through the Housing Summit, we established a coalition of consumer and community organisations that continues to work together. In Section 2 of this report we provide more detail on that on-going process.

Building health and wellbeing into services design

The evidence base outlined the need to capture all the benefits of energy management in program design and build better platforms for collaboration.

There is constructive work being undertaken by Australian, State and Territory governments to help consumers manage their energy. All jurisdictions run programs to promote the efficient use of energy – examples include providing information and tools to help consumers get a better energy deal, replacing inefficient appliances for low-income households, and subsidising or providing loans to households to install solar panels.

The objectives of those schemes however can differ – they may focus on addressing affordability for particular households or on reducing CO2 emissions. As such, jurisdictions and programs record and report on the impact of these programs in different ways.

A key lesson from LIEEP was that the co-benefits of these programs are substantial, and in fact are likely to outweigh savings in energy and emissions. As such, those impacts should be tracked and recorded, to make sure that we capture the full benefit from those programs.

Through Power Shift, we developed the *Multiple Impacts of Energy Efficiency* framework, to help government and industry quantify and measure those benefits. Section 2 provides more detail on this framework.

SECTION TWO: RESEARCH INTO THE DRIVERS AND BENEFITS OF CHANGING ENERGY USE

A. Power Shift's foundations

The foundation for Power Shift's research was the Low-Income Energy Efficiency Program (LIEEP) which trialled and assessed the effectiveness of a range of energy efficiency measures.

Funded through Australian Government grants, the program supported 20 pilot projects, trialled 44 different interventions and collected data on 20,000 low-income and vulnerable consumers across Australia.

While the origins of LIEEP came from a desire to test emission reductions initiatives, the rich data generated from the pilot projects delivered far-reaching insights into consumer behaviour and energy management.

The pilots were run by consortia, comprising community groups, local governments and not-for-profit organisations working with a research partner with relevant expertise. They used a range of methods ranging from in-home visits for older households to online interactive educational games for young renters.

Participants were drawn from across Australia. The pilots covered metropolitan, rural and remote regions, and eligibility to engage in the program was focused on household income. The projects covered a diverse range of households (elderly/young, homeowners/renters, Indigenous, and refugees).

This program was ground-breaking because it showed that targeted, rather than `mass market', initiatives are needed to help those who need it most. For example:

- a single parent family in a rental property is most unlikely to benefit from subsidised solar panels;
- a carer for a person with a disability may be unable to offer advice on energy efficiency due to other more pressing health and well-being priorities; and
- a retired couple on a pension may be reluctant to use on-line energy comparison sites due to concerns about marketing or a lack of digital know-how.

A deep dive into the outcomes for low-income households

The meta-analysis of the outcomes produced through the LIEEP pilots was provided in the report, *Driving Change*.[6] The report was authored by the Group of Energy Efficiency Researchers Australia (GEER), a network of researchers that was established through the LIEEP pilots.

What helped households save energy

There were 44 initiatives trialled through the LIEEP pilots.

Initiatives included combinations of information, training and audits delivered directly to households in their home, and retrofitting of the house. Major retrofits included insulation and replacement of major appliances, while minor retrofits sealed draughts and replaced lightbulbs.

Some pilots trialled a range of different ways to provide feedback to the participant – a couple of trials provided an in-home display, and some built champions within their local community to give participants easy access to advice and assistance.

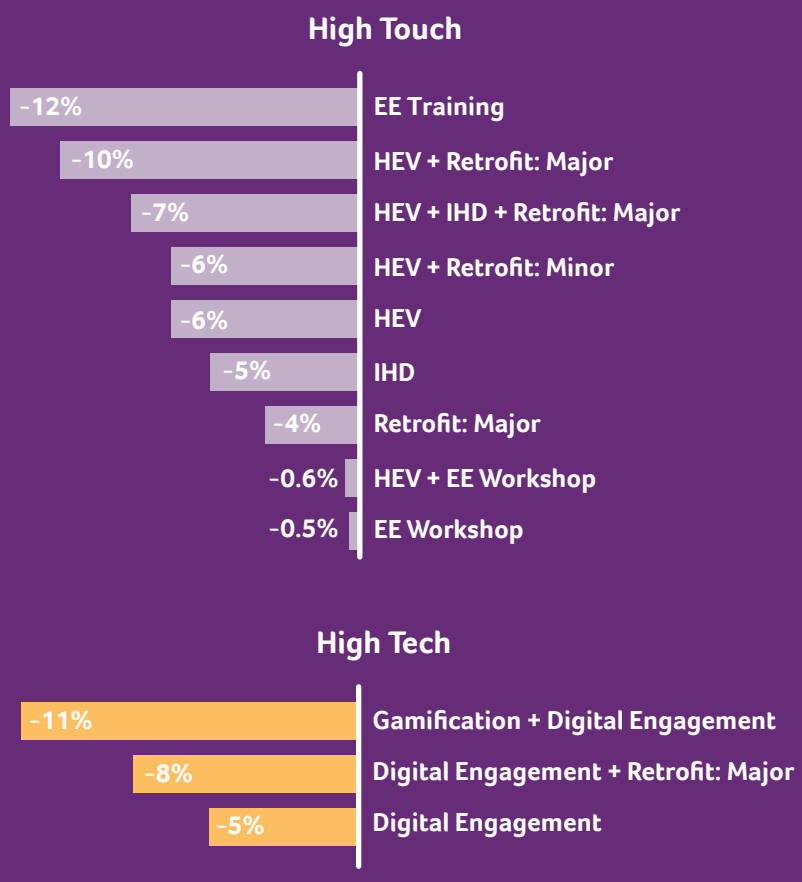
6 Available on ECA's website at *https://energyconsumersaustralia.com.au/wp-content/uploads/Driving-Change-Identifying-what-caused-low-income-consumers-to-change-behaviour.pdf*

Pilots also trialled digital technologies to engage and communicate with customers, including sending text messages or emails, and building online communities. A truly innovative approach was the use of gamification – using games to engage and educate consumers about energy efficiency.

Overall, most projects reduced average daily household use by between 2-12%. Pilots were classified as either high touch – where there was face to face contact with the participant - or high tech, depending on whether digital channels were used to reach households.

The digital engagement results are interesting and seem to offer the most potential for scaling up quickly. Reduce Your Juice[7] – a game developed for young renters – reported reductions of household energy use of around 11%.

FIGURE 3: REDUCTION IN AVERAGE DAILY HOUSEHOLD ELECTRICITY USE PER INITIATIVE



Key: HEV – home energy visits; IHD - in-home energy monitor displays; EE – energy efficiency

7 For more information, see *https://www.citysmart.com.au/showcase/reduce-your-juice/*

The pilots were diverse and using averages does not paint a complete picture of household experiences. But the evidence base built through LIEEP indicates where there is likely to be most impact.

The most successful pilots demonstrated clear potential benefits. The initiatives that achieved the greatest reduction in electricity consumption focused on training (one project, -12%), gamification with digital engagement (one project, -11%) and a home energy visit with major retrofits (two projects, -10%). The latter impact is unsurprising given that major retrofits typically involved a significant energy efficiency upgrade, such as insulation or a new hot-water system. The Reduce Your Juice pilot reduced energy usage by 11%, through gamification and building a digital community where participants could share their results.

LIEEP indicates where there are clear opportunities to roll out at scale improved measures to help low-income households manage their energy bills and usage.

TABLE 3: MOTIVATIONS AND BARRIERS TO ENERGY EFFICIENCY

TOP FIVE MOTIVATIONS WERE:	TOP FIVE BARRIERS WERE:
• Awareness – people wanted to understand how to manage their energy	• High perceived costs – where replacing appliances or in-home modifications were seen as unaffordable
• Low perceived cost – wanting to reduce their bill	• Lack of knowledge – people didn't have a great understanding of what they could do and, perhaps more importantly, didn't know how to access that information
• Incentives and rebates – extrinsic rewards were used at different stages and in different amounts, but some consumers were also motivated by altruism	• Lack of trust – participants had low trust in industry and government
• Comfort	• Split incentives (for example, between renters and landlords)
• Improved health and wellness, and reduced stress	• Low literacy

LIEEP insights into household decision-making

The 20 pilots generated a wealth of information.

By aggregating the data across the 20 pilot programs and analysing common themes beyond just changes in energy use and bill outcomes, we have better insight into the reasons why low-income consumers changed their energy behaviour, and the reasons why they did not.

Crucially the researchers found these motivations and barriers did not correlate with age or other demographic factors.

Driving Change outlines a program delivery framework to guide other energy management programs through recruitment, engagement, education and outcomes. It details the factors that contributed to the effectiveness of a pilot – noting that projects were more likely to succeed where they were tailored to fit the lifestyles and values of participants, were trusted by participants, drew from an evidence base, balanced project with participant needs, and were appropriately resourced.

Understanding the target households

The most effective initiatives were where information was tailored to the consumer's circumstances and needs – for example, for elderly customers, that meant approaching them through trusted networks, providing information in digestible amounts, and face to face wherever possible.

Newly arrived migrants – with little or no experience of energy delivered through a market - required information and education about how to engage in the market, and how their usage was tied to their bills.

Families with young children liked communications through digital channels, so they could get help at a time convenient to them.

The meta-analysis of the LIEEP data in *Driving Change* grouped low-income participants into three broad categories: 'New to Energy', 'Energy Without Effort' and 'Stressed by Energy'.

FIGURE 4: CONSUMER SEGMENTS AND ATTRIBUTES

These broad consumer segments provide government and industry with guidance to better understand vulnerable households and how to reach them. *Driving Change* also provided crucial insights into the types of energy management programs best suited to them. It should be noted that LIEEP participants volunteered to engage in the pilot – households who are not so motivated might require additional efforts to engage.

A trusted voice

The program underlined the value of delivering information through a trusted voice.

A common theme across all pilots was that these households responded best when information or offers of assistance were delivered through an organisation or individual that was considered a trusted - and typically independent - voice.

B. Link between energy, housing and health

The LIEEP pilots provided evidence of the relationship between energy, housing and health.

A number of LIEEP pilots reported that some housing stock was so poor, the energy efficiency initiative simply had no impact.

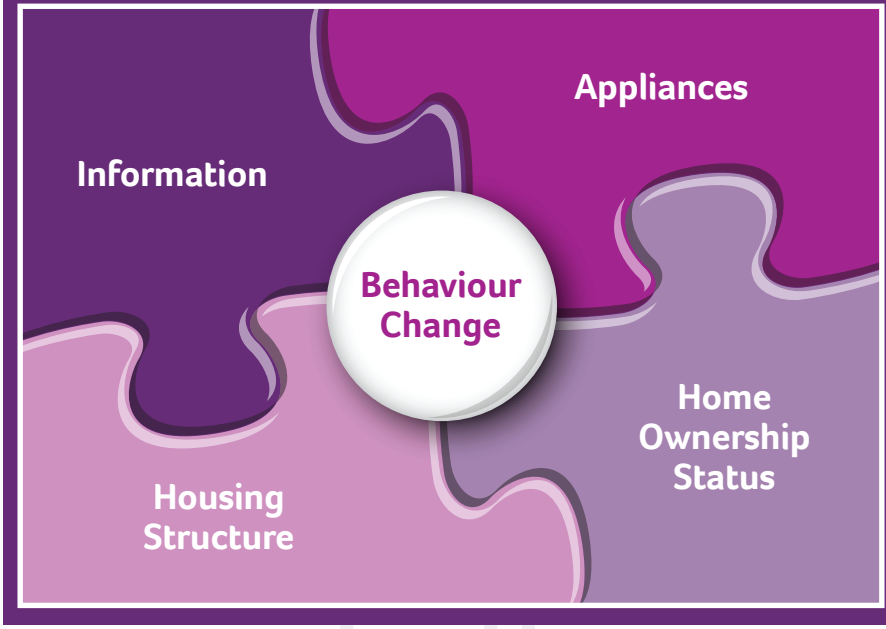
While LIEEP pilots were focused on energy efficiency, 19 of the projects underlined the significant co-benefits (or impacts) of consumers managing their energy use to live comfortably in their homes, as energy is critical to health and wellbeing and social inclusion.

Health costs can be impacted by people living in homes that are not protected against extremes of temperature and where homes are damp, while social exclusion because of energy rationing can impact on mental as well as physical health costs.

We commissioned GEER to identify the co-benefits, and its report *Empowering Low Income Households* outlined the 12 co-benefits captured by LIEEP, including knowledge, empowerment, control/ self-efficacy, confidence, competency, financial control, interest, positive attitude, financial stress, general stress, perceived comfort and thermal comfort. The areas of most notable improvement were confidence, knowledge, competency and thermal comfort.

The experience of LIEEP participants also highlighted the need to ensure that a focus on energy efficiency does not encourage unhealthy or unsafe rationing – and this is particularly true for older households who are already frugal.

FIGURE 5: ENABLERS OF IMPROVED HOUSEHOLD ENERGY EFFICIENCY



C. Household sentiment and behaviour

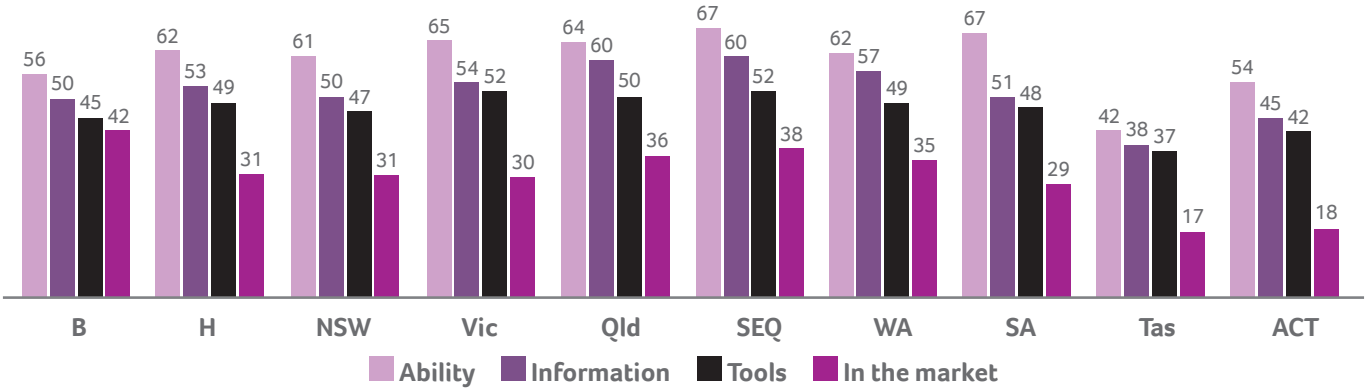
While the focus of Power Shift was on vulnerable and low-income consumers, we realised early on that there were lessons for how all households could benefit from managing their energy use and controlling their costs.

Through our biannual *Energy Consumer Sentiment Survey (ECSS)*, households have told us that more can be done to improve their confidence in achieving better outcomes from energy markets.

As our understanding increased, we built questions into the ECSS about energy management and behaviour, to ensure that we captured a complete picture of Australian households' experience in the energy market.

We commissioned an analysis of the ECSS data with the aim of further unpacking what it tells about the capacity and willingness of households, including those in financial stress or with low incomes, to manage their energy use.

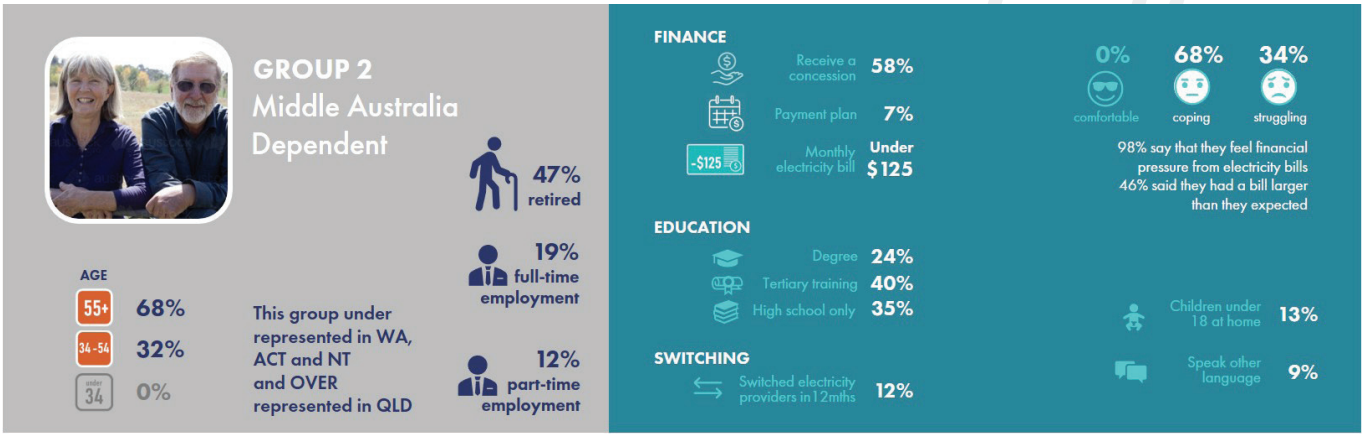
FIGURE 6: HOUSEHOLD CONFIDENCE IN MANAGING THEIR ENERGY COSTS[8]



8 Source: Energy Consumers Australia *Energy Consumer Sentiment Survey June 2019* https://energyconsumersaustralia.com.au/projects/consumer-sentiment-survey

Back2Back Consulting synthesised the ECSS data and research to develop profiles of Australian consumer energy use, behaviours and attitudes. That analysis in *Consumer Sentiment and Behaviour*[9] provides further insight into the diversity of Australian households.

FIGURE 7: AUSTRALIAN CONSUMER ENERGY USE, BEHAVIOURS AND ATTITUDES[10]



Two thirds of group 2 are over 55, with approximately one third between 34-55. Approximately half of this group is retired and about 40% are still working in ether full time or part time employment. Their monthly bills are all under $125 per person and close to 60% also receive a concession. This group is moderately educated with three quarters having no education or only tertiary education such as TAFE or a diploma. None of this group feel that they are financially comfortable. They are highly represented in QLD.

This group needs help with bill paying and feels under significant pressure from general and electricity bills. This group has low confidence in their ability to make good choices or that the market supports them to make good choices. They are also generally unsatisfied with their energy providers, have less energy saving devices than other groups and will most likely have a pool. However, they do intend to buy more energy efficient devices, but are probably less able than other groups to do so.

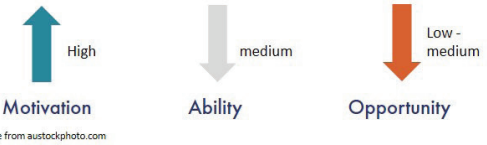
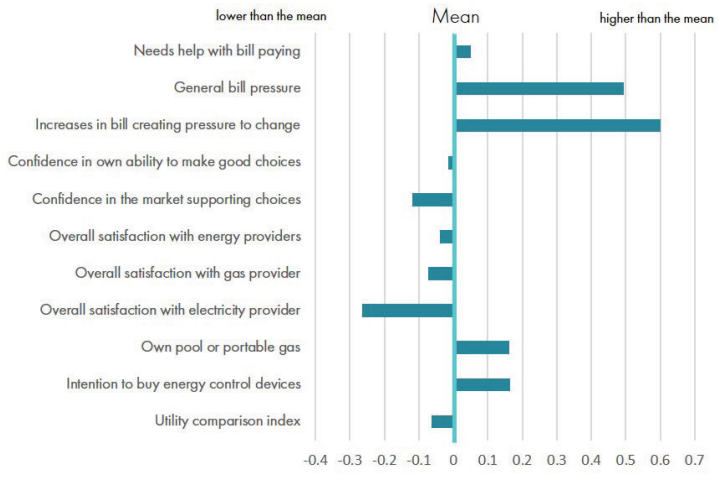


*image from austockphoto.com



9 Back2Back Consulting (2019) *Consumer Sentiment and Behaviour* https://energyconsumersaustralia.com.au/wp-content/uploads/Consumer-sentiment-and-behaviour.pdf
10 Ibid.

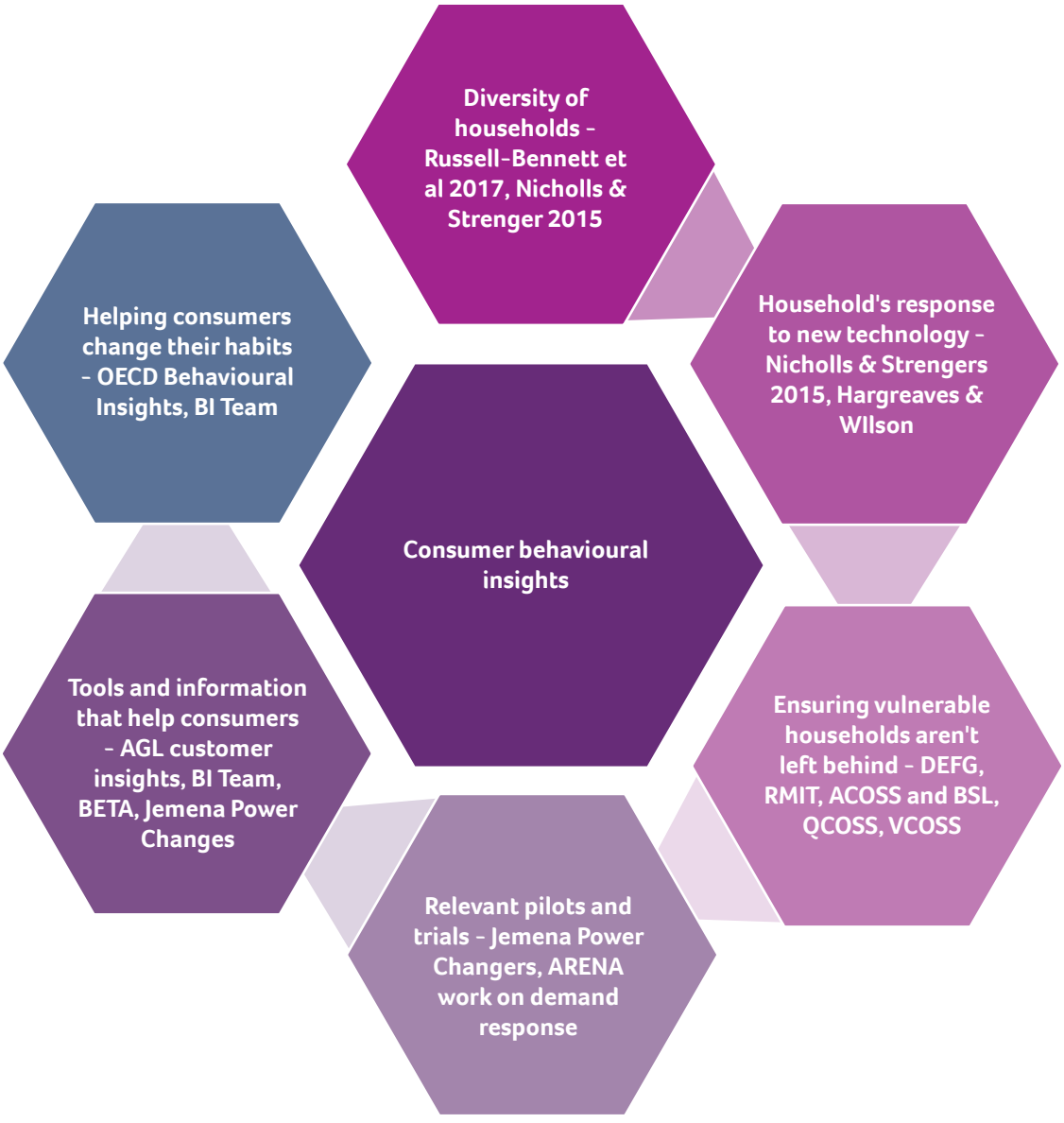
D. Other behavioural research

Power Shift also drew on other relevant research unpacking how Australian households make decisions on their energy use.

The level of research on energy consumers – in Australia and overseas – has grown exponentially and was a valuable input to Power Shift over the life of the project.

Figure 8 shows the research we found the most influential – the following depicts the different dimensions, and how it informed our thinking. Details of a number of these research reports are provided in the selected bibliography in Appendix B.

FIGURE 8: COMPLEMENTARY RESEARCH TO POWER SHIFT



E. International research

The challenges faced by Australian consumers in managing energy use and costs are similar in other countries. The International Energy Agency frames energy efficiency as the 'first fuel of a sustainable energy system', contributing to climate change mitigation and energy security, and has created resources to help policymakers.[11]

The Group of Energy Efficiency Researchers (GEER) found over 1,000 energy efficiency projects in Australia and across the world over the past decade. This means there is a significant evidence base for policymakers and industry to draw upon for future policies and initiatives in a number of countries.

Assessing the outcome of these energy initiatives targeted at households can be challenging because their format can vary widely and involve a combination of engineering retrofits to the home, energy audits, in-home displays, education, changes to energy tariffs, incentives, and even influencing social norms.

To test the findings from Australia's experience with household energy management programs against international experience, we partnered with GEER on their literature review to identify the type and features of energy efficiency interventions that are most effective.

The review *Effectiveness of Household Energy Efficiency Interventions in Advanced Economies*[12] reinforced many of the findings from LIEEP, and most importantly consolidated the evidence that consumer-centred design must be the focus of energy management programs.

International findings

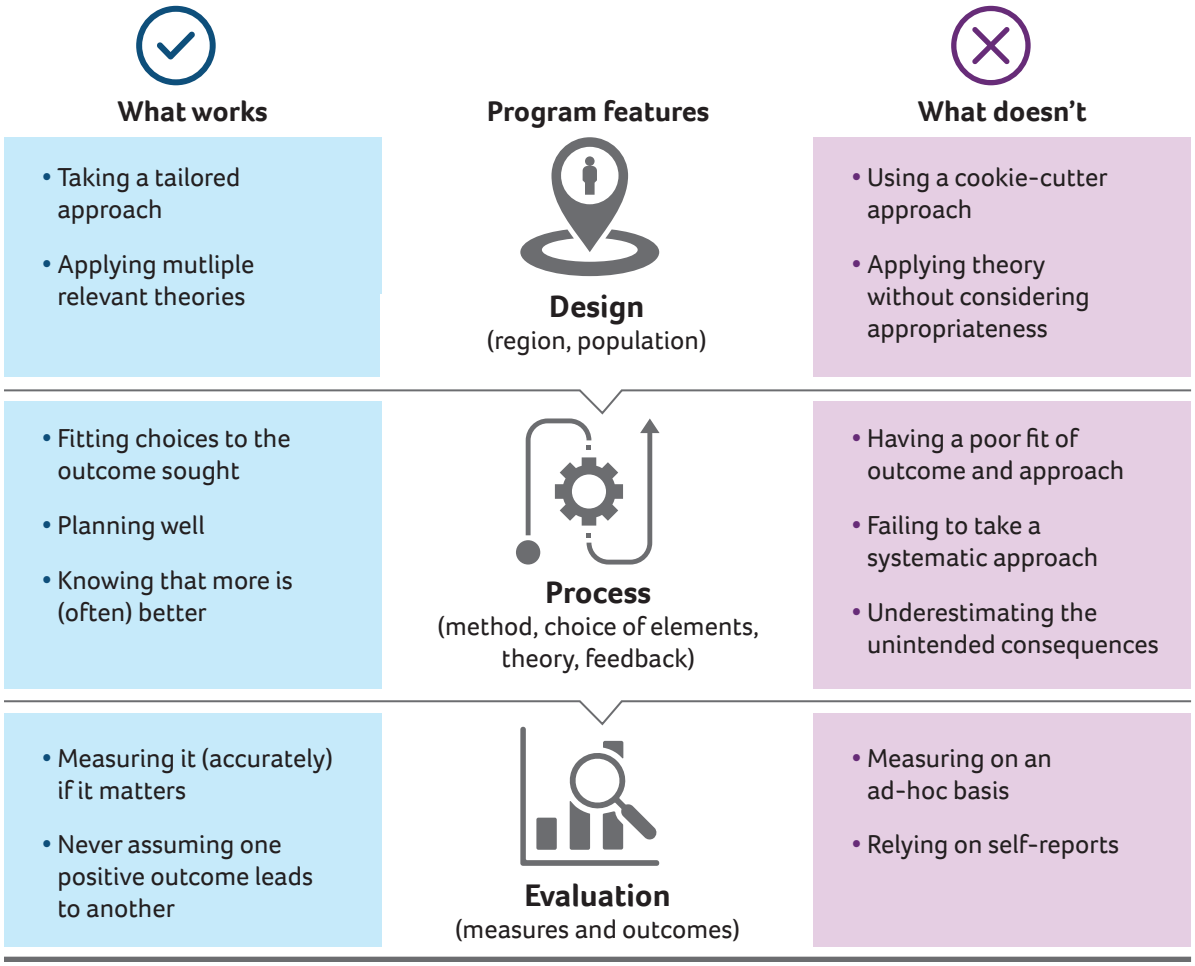
Some of the key findings in the report are:

- most energy management interventions achieve their aim, but it can be difficult to directly compare the results;
- there can be unintended consequences for some interventions. For people living below the poverty line, their low-energy use does not indicate energy efficiency. Instead they are sacrificing their health and wellbeing to ensure a lower energy bill; and
- interventions can backfire. Most commonly seen in home audits, smart meters/in-home displays and pricing interventions, customers can do the opposite of what is expected. It could be because they `do not want to be told what to do' (also known as `consumer reactance') or consumers compensate for `saving' in one area by `spending' more in another.

11 See https://www.iea.org/topics/energyefficiency/

12 Russell-Bennett, R., McAndrew, R., Gordon, R., Mulcahy, R. and Letheren, K. (2019). *Effectiveness of Household Energy Efficiency Interventions in Advanced Economies – what works and what doesn't. Final Report.* Brisbane: Queensland University of Technology. Available at https://energyconsumersaustralia.com.au/wp-content/uploads/Effectiveness-of-Household-Energy-Efficiency-Interventions-in-Advanced-Economies.pdf

FIGURE 9: ENERGY EFFICIENCY INTERVENTIONS – WHAT WORKS AND WHAT DOESN'T[13]



Implications and recommendations for energy policy

GEER identified useful directions for energy policy and advocacy, including:

- successful programs recognise the complexity of energy behaviour;
- context really matters – ensuring that policies and programs appropriately support the segmentation, tailoring and targeting of interventions;
- energy policies and intervention must be consumer-centred;
- clarity of aims and objectives will help achieve desired impact;
- good evaluation is the key to demonstrating success; and
- be mindful of unintended consequences – plan carefully to ensure that the program is appropriate for the target households and in that location.

13 Ibid, p. 14

F. Capturing the wider benefits

There are benefits to consumers when they use energy more efficiently – both how much they use and when they use it – in the form of lower bills, as well as wider system benefits.

These benefits will only increase as technology unlocks the potential for consumers to be more flexible in their energy use, and as changes are made to the built environment in the form of lower energy operating costs of housing and major appliances.

Paradoxically though, it remains the case that mechanisms and reforms that will enable the potential for greater consumer participation in managing energy use, at times when it can have the most value, remains under-utilised.

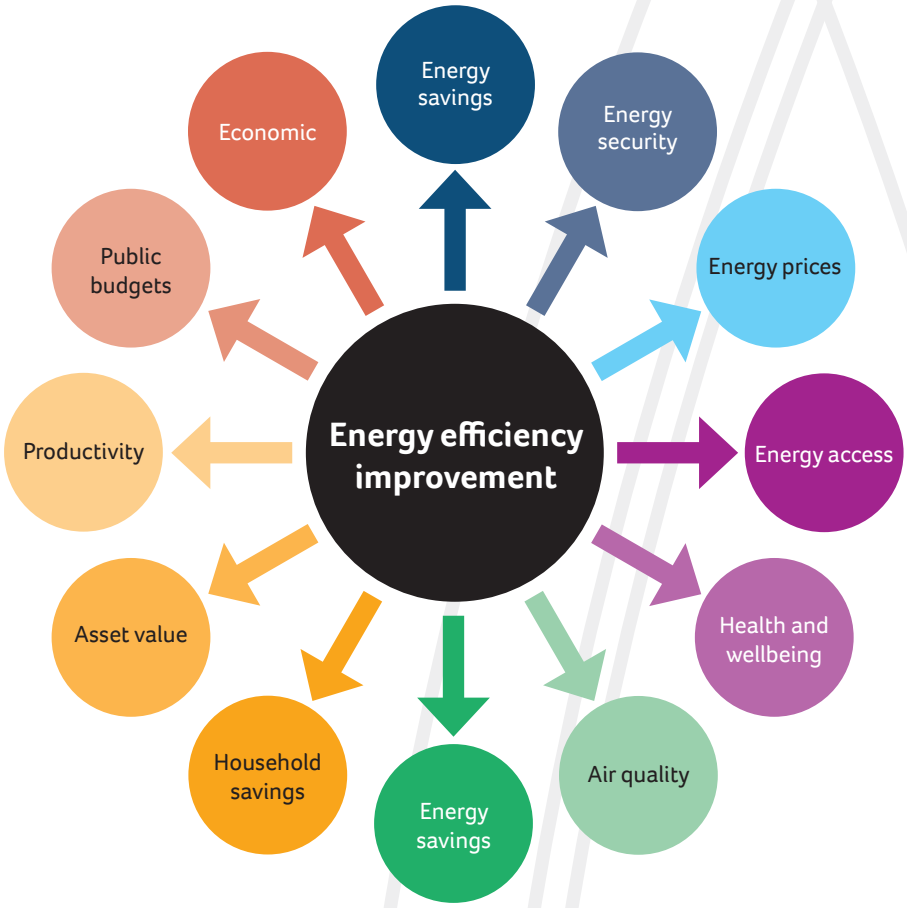
There are some lessons that can be drawn from the experience with energy efficiency.

Internationally, to focus governments' attention on what should be considered the least-cost option, the International Energy Agency (IEA) developed a framework to identify the range of potential benefits delivered by using energy more efficiently.

The IEA describes energy efficiency as the 'first fuel of a sustainable energy system', encouraging governments to scale up actions to encourage more efficient use.

The IEA framework captured the range of benefits – to the individual, to the energy sector, and to society – of using energy more efficiently.

FIGURE 10: IEA CO-BENEFITS OF ENERGY EFFICIENCY[14]



14 Source https://www.iea.org/topics/energyefficiency/

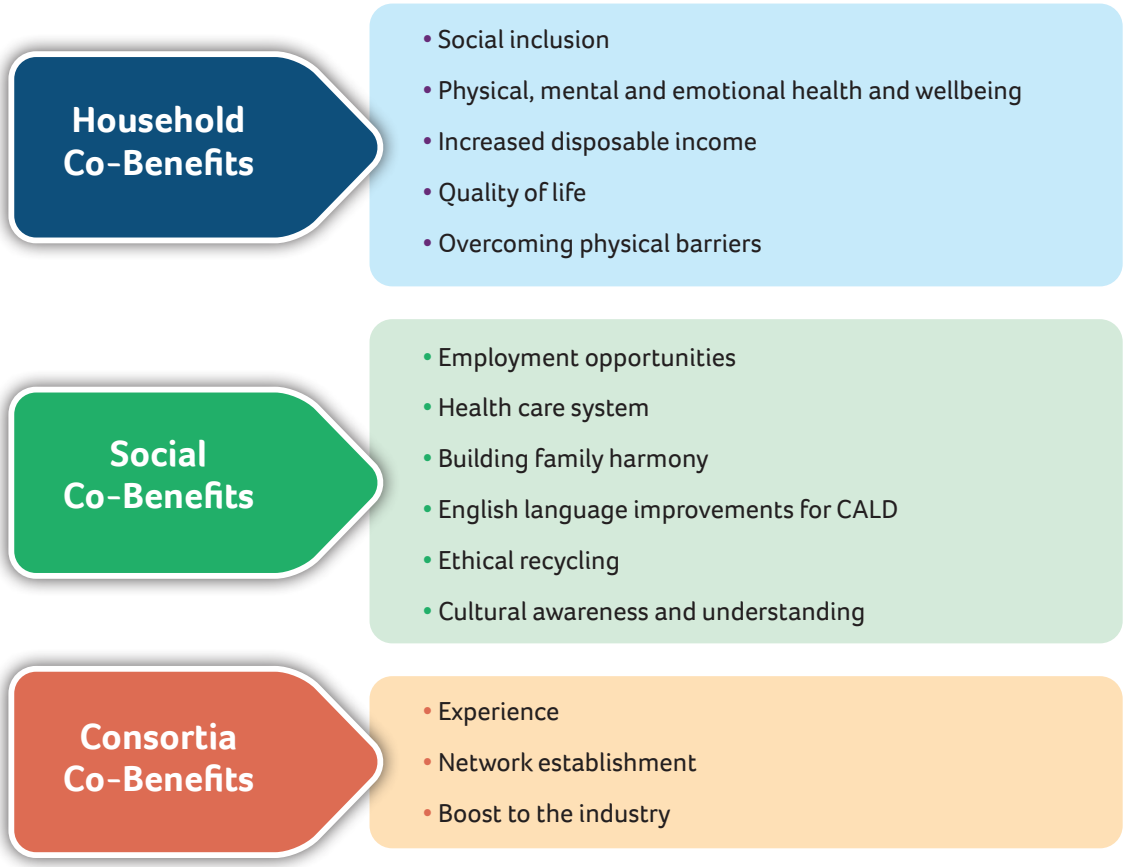
In Australia, Power Shift's research indicates that helping people manage their energy has impact far beyond reduced greenhouse gas emissions or cost savings to households.

Empowering Low Income Households, GEER's analysis of the LIEEP outcomes, identified a range of 'co-benefits' for which they had no common measure.

Engagement in the LIEEP trials reduced participants' stress and anxiety levels, and they reported positive improvements to their levels of knowledge, confidence and self-efficacy.

The GEER analysis also highlighted other, broader benefits to giving households more control over their bills, detailed in Figure 11 below.

FIGURE 11: CO-BENEFITS REPORTED IN LIEEP PILOTS[15]



15 Source GEER (2018) *Empowering Low Income Households* https://energyconsumersaustralia.com.au/wp-content/uploads/Empowering-Low-Income-Households-delving-into-LIEEP-co-benefits.pdf

GEER also highlighted another issue – that the way in which LIEEP pilots reported on the co-benefits was inconsistent, making it difficult to compare different results.

The lack of a common lexicon to measure and describe impacts was noted, as was our need to move away from the language of 'energy efficiency' which tends to be heard as an energy conservation message, and instead consider 'energy management'.

Helping policymakers build a better business case

Energy Consumers Australia commissioned ACIL Allen to develop a framework to quantify and define the full range of benefits for Australia - a large continent marked by extreme differences in temperatures, population concentration and household wealth.

Policymakers have conventionally measured the success of a household energy efficiency program in a simple way: did energy use or energy costs go down?

One of the most dramatic insights provided by Power Shift research is that the physical and social consequences of inefficient energy use are much greater than previously thought. Until now the benefits have not been well understood or measured.

For example, a household received assistance to replace an old electricity-guzzling heater. The household's ongoing electricity cost saving is then spent on heating their damp home to a more comfortable temperature. This improved their health and wellbeing, reduced financial stress and allowed their children to concentrate more effectively while doing their homework[16].

Power Shift sought to understand these additional benefits to households, and the best ways industry and policymakers could measure them when assessing the success of household energy management programs.

Multiple Impacts of Energy Efficiency framework assists government and industry to place a value on all the impacts of efficient energy use, so that any future cost-benefit analysis of energy efficiency programs more accurately reflects the true benefits to consumers, society and the economy.

It points to the considerable body of evidence indicating that the non-energy benefits (such as increased home comfort and better health) could be of greater value than the energy savings.

The *Multiple Impacts of Energy Efficiency* framework describes each impact, encouraging the development of a common lexicon. It gives us a better understanding of the materiality of the impact, and where there is an existing validated survey instrument for capturing it. The *Multiple Impacts of Energy Efficiency* framework also provides links to where there is an evidence base, or where further research would be useful.

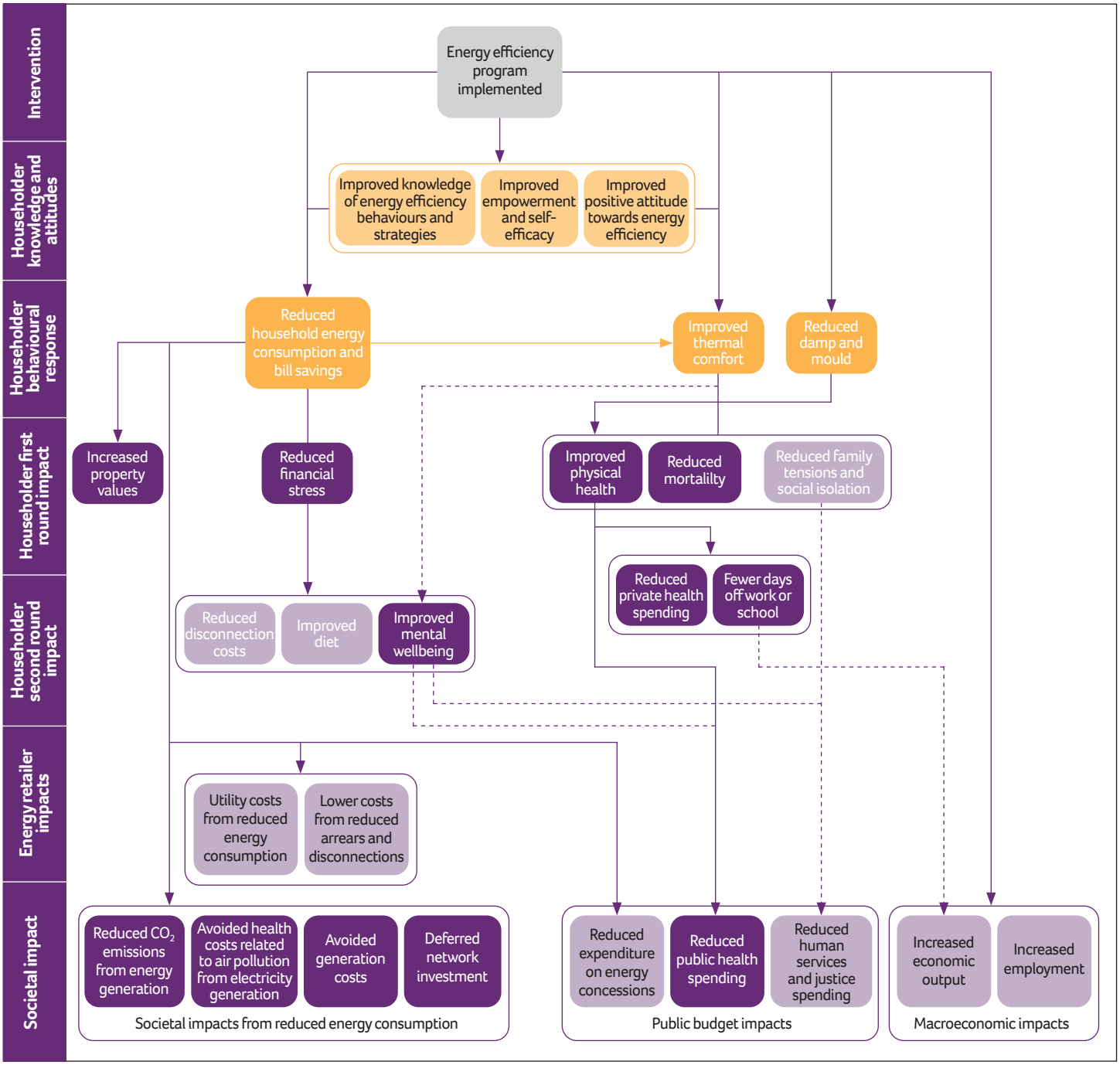
The Framework includes the impact on:

- household health and wellbeing, including direct and indirect impacts of improved thermal quality, reduced dampness;
- other participant benefits, including at the household level greater empowerment and social capital, and at the organisational level new partnerships and business opportunities;
- energy system impacts, including deferred investment in generation and networks, reduced peak demand; and
- macro-economic impacts, framed either through the impact's source, or the nature of its economic effect – they include higher business profits and increased disposable income as the result of reducing energy costs, with consequent impact on GDP.

Figure 12 maps the framework. Impacts presented in a darker shade are underpinned by a more substantial evidence base. Interrelationships between impacts are indicated by connecting arrows - a solid line indicates a stronger causal link, while a dashed line represents as weaker causal link between impacts.

16 ACIL Allen (2017), *Multiple Impacts of Energy Efficiency*, p7

FIGURE 12: ENERGY EFFICIENCY IMPACTS LOGIC MAP

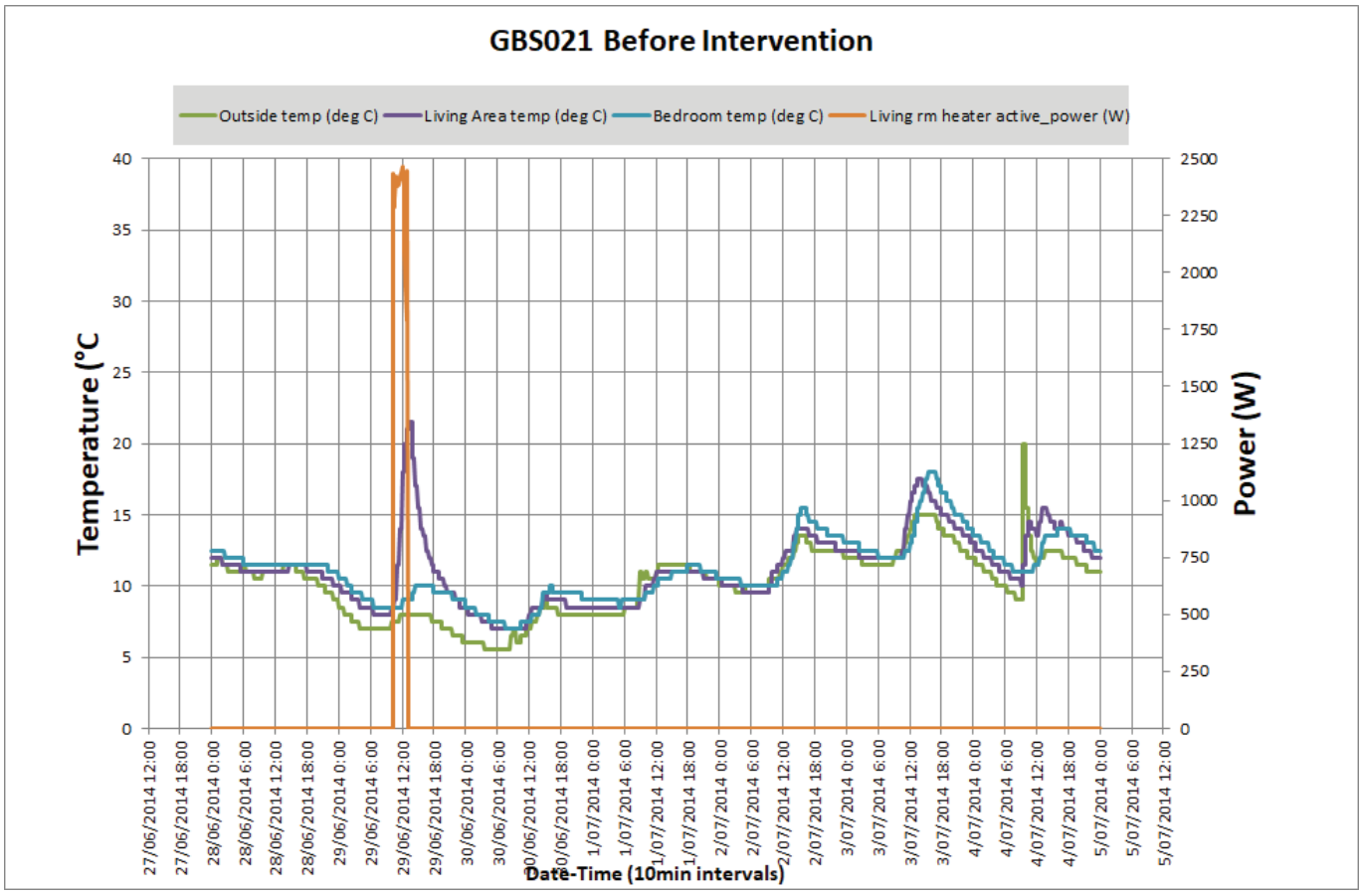


G. Energy and housing

The LIEEP projects demonstrated the impact of homes with poor thermal efficiency on energy usage. For the people living in those houses, their lives can be grim.

That is powerfully demonstrated in Figure 13, which measured the temperature in the loungeroom of a LIEEP household in Hobart in winter – the green line is the temperature outside, and the purple the temperature in their loungeroom. The spike in loungeroom heat was when they knew a visitor was coming – the rest of the time, the temperature of their loungeroom was between 10-15 degrees.

FIGURE 13: IMPACT OF POORLY HEATED HOMES: MISSION AUSTRALIA GET BILL SMART [17]



17 Source: AusIndustry presentation to IREE 2017

When homes leak warmth or cool air, no amount of information or assistance will help. And shame and embarrassment about living conditions can be significant barriers to seeking assistance.

Given the nexus between energy, housing and health, we sought to take advantage of the opportunity to address the energy performance of housing as a priority for Power Shift over the final 18 months of the project.

Government officials were talking about housing in a new way, identifying it as critical to energy affordability. At the same time State and Territory Governments were taking new approaches to housing programs and pilots, responding to issues raised by consumer advocates about energy costs and affordability.

In partnership with consumer advocacy organisations Renew and the Australian Council of Social Service (ACOSS), Energy Consumers Australia developed a comprehensive housing strategy.

In the housing strategy we went first to the evidence base, emphasising the critical link between energy performance and household health and wellbeing. We commissioned ACIL Allen to develop a short background paper[18], based on the *Multiple Impacts of Energy Efficiency* framework, to make clear that the status quo was resulting in bad outcomes for consumers and was more expensive for government. We built into our strategy the recommendations of a substantive report by ClimateWorks and the Australian Sustainable Built Environment Council which demonstrated that improvements were achievable and affordable.

Working with a coalition of stakeholders, we convened a Housing Summit[19] in September 2018, inviting consumer and community organisations as well as industry and government who had been working on those issues in their jurisdictions to come together.

At the Summit, the CEOs of a number of consumer and community organisations called for a comprehensive national strategy to improve the energy performance standards of all Australian homes.

Building on the communique, a joint statement signed by 36 consumer groups and 21 supporting organisations urged COAG Energy Council to commit to action at its meeting in December 2018.

(L to R) Alison Rowe, CEO, Australian Energy Foundation; Donna Luckman, CEO, Renew; Rosemary Sinclair, CEO, Energy Consumers Australia; Cassandra Goldie, CEO, Australian Council of Social Service

Success was achieved when in February 2019, Energy Ministers agreed to a trajectory that aims to raise energy performance standards for new housing from 2022, with built in review points. In July 2019, the Building Ministers' Forum agreed to the development of enhanced energy efficiency provisions for new residential buildings.

The coalition of agencies built through the Housing Summit continues to work together, ensuring the consumer voice is heard, and is now engaging in the processes that have been initiated to improve the energy performance of some 10 million existing homes.

18 ECA (2018) *Healthy and comfortable homes for all Australians* available at *https://energyconsumersaustralia.com.au/wp-content/uploads/Power-Shift-Housing-Summit-Background-Paper.pdf*

19 See *https://energyconsumersaustralia.com.au/news/housing-summit-2018-publications-resources/*

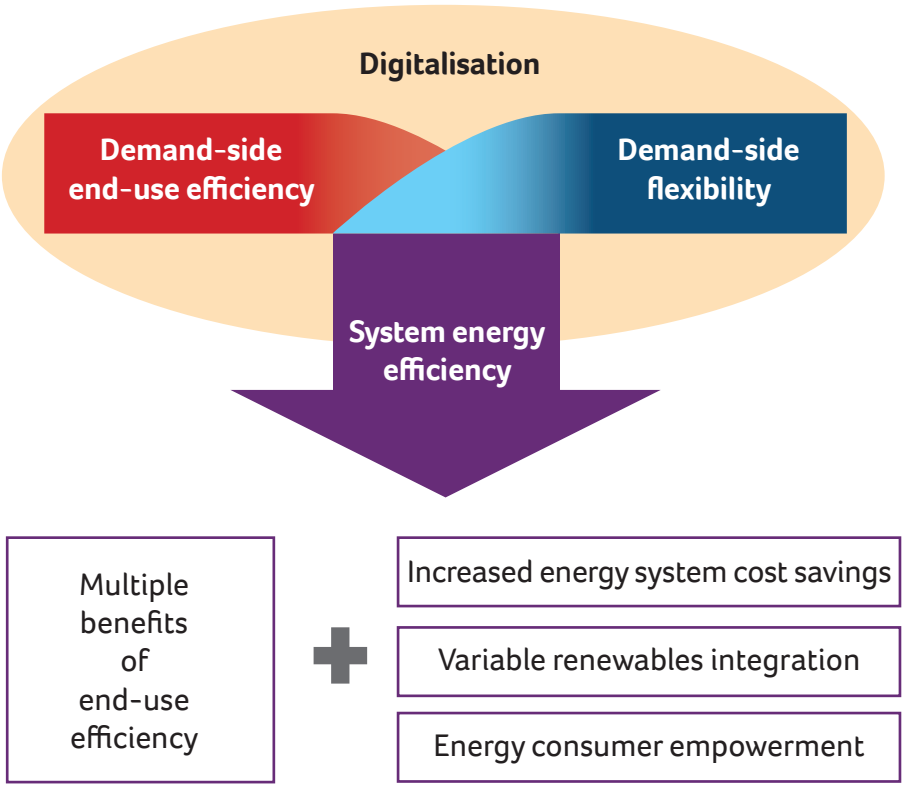
H. How Power Shift helps navigate market transformation

Power Shift has played an important role in Energy Consumers Australia's framing of the role of consumers in a transforming energy market, and the challenges they face.

Power Shift has been informed by the research and policy discourse underway, exemplified by the IEA's work on digitalisation[20]. The emergence of digital technologies providing consumers with timely, accurate feedback and greater control over their use has brought us to the point where we are now seeing the behaviour of individual consumers having direct and immediate impact on energy supply systems.

We have reached a pivot point – where there is now the technological capacity to give consumers greater control over their usage and bills. This creates the opportunity in a transformed energy system for consumer participation in demand-side solutions, that mitigate the need for costly investment in long-lived assets on the supply side.

FIGURE 14: HOW DIGITALISATION POTENTIALLY CHANGES TRADITIONAL CONCEPTIONS OF ENERGY EFFICIENCY AND DEMAND-SIDE FLEXIBILITY[21]



20 See https://www.iea.org/topics/energyefficiency/digEE/
21 ibid

Power Shift's insights into consumers underlines the need for those solutions to be described in terms that customers will value, and to which they can respond.

How we frame that discussion is important.

Energy efficiency has traditionally been presented to customers in normative terms. Households are asked to stop 'wasting' energy, or to use it 'responsibly'.

The LIEEP evidence base demonstrates that those messages have caused unintended consequences – customers who place value on frugality and are stressed about their bills are more likely to ration to unhealthy levels. Power Shift and behavioural research makes clear that different households have different constraints –a family with young children will find it very hard to use less at bath, dinner and bedtime ('feral o'clock' as one parent described it)[22].

And digitalisation adds another dimension – making it easier to monetise avoided or deferred energy demand. When a number of households or consumers can be aggregated, their individual choices about when and how to use energy have real value in the energy market. A consumer should know when that is the case and be rewarded accordingly.

People may still choose to conserve energy for altruistic and community reasons – indeed our research indicates that is a strong motivator. But just as we should endeavour to capture the full range of benefits from energy management, we should also be able to describe both the individual and the systemic value to a consumer, recognising that different consumers may have different motivations.

The energy management services to connect and package digital technologies in a way that works for consumers are yet to emerge at scale. Consumers will not see good outcomes unless we can knit devices and appliances together, and reward consumers for the flexibility in their energy use through 'prices to appliances'.

In this context, a key factor will be engaging with consumers on the permissions and trust that they require to engage as partners in how appliances in their home are activated as part of the energy system. We are beginning to see this conversation emerge in a number of contexts and studies both internationally and in Australia, in particular:

- the work by Carnegie Mellon University and Argo AI research partnership on autonomous vehicles[23];
- the work by the Smart Electric Power Alliance (SEPA) on autonomous home energy management[24];
- the work by Dr Tom Hargreaves[25] on smart home control, which is similarly being explored by Dr Sarah Pink and Dr Yolande Strengers at the Emerging Technologies Lab[26] at Monash University;
- the work being done through the UK's Energy Systems Catapult[27], in their Living Lab, and as another example The Green Village[28] in the Netherlands;
- the International Energy Agency's Technology Collaboration Program on Demand-Side Management[29] User-Centred Energy Systems Technology Collaboration Program, Social license to automate project being led by Australia; and
- the Digital Energy Futures Project[30], which is being led by Monash University in partnership with Ausgrid, Ausnet Services and Energy Consumers Australia.

The lessons from Power Shift demonstrated powerfully that a new way of thinking is required to design tools and information that will be effective in empowering all consumers, including those that are vulnerable to cost-of-living pressures, to take control of their energy bills.

22 Nicholls and Strengers (2015) *Changing Demand: Flexibility of energy practices in households with children* *https://energyconsumersaustralia.worldsecuresystems.com/grant-archive/623-energy-practices-in-larger-households*
23 For more information, see *https://www.cmu.edu/news/stories/archives/2019/june/argo-center.html*
24 See *https://sepapower.org/knowledge/the-4-levels-of-autonomous-home-energy-management/*
25 See *https://people.uea.ac.uk/tom_hargreaves*
26 See *https://www.monash.edu/it/our-research/strengths/chic/research/emerging-technologies-lab*
27 See *https://es.catapult.org.uk/* for information about their research, including the Living Lab
28 *https://www.thegreenvillage.org/*
29 For information about the program overall, see *https://www.iea.org/tcp/dsm/* and for information on the project, see *http://ceem.unsw.edu.au/sites/default/files/event/documents/TCP%20DSM_Presentation_monash-unsw%20final%20web.pdf*
30 See *https://www.monash.edu/it/our-research/strengths/chic/research/emerging-technologies-lab/digital-energy-futures*

SECTION THREE: OPPORTUNITIES FOR EMPOWERING CONSUMERS

A. Opportunities for innovation in energy services

A key focus of Power Shift was identifying the opportunities for market-led solutions.

We developed our work in this area in three stages:

- a scoping study with The Brattle Group to identify the barriers to innovation in new energy services, and subsequently convened two Innovation in Energy Services workshops;
- working with the Australian Energy Foundation to scope the content and structure of a voluntary industry guideline; and
- working with ACIL Allen to develop a segmentation framework that focused on the needs of customers.

Barriers to innovation in energy services

Innovative new technologies for generating, storing, and managing electricity are emerging which change when and how we use electricity – and, consequently, the entire electricity system. Solar panels allow homes and small businesses to generate their own power, while home batteries or electric vehicles with vehicle to grid technologies allow us to store it.

Smarter, more efficient appliances are emerging that can give us better information about how and when they are drawing power, while allowing consumers or other third parties a host of pre-programmed and dynamic smart controls. Taken together these new technologies hold out the promise of individualised services, helping households and businesses to better manage their energy use and reduce their bills.

However, the energy management services to connect and package these new technologies in a way that works for consumers is yet to emerge at scale and it remains very difficult for most households and small businesses to track and understand their energy use, let alone take steps to manage it.

To understand the factors holding back the delivery of innovative customer services and technologies, Energy Consumers Australia commissioned The Brattle Group to do a scoping study to review similar markets where those services are already in place, and to talk to a small group of companies offering innovative energy services, who are currently active in, or had sought to enter the Australian market.

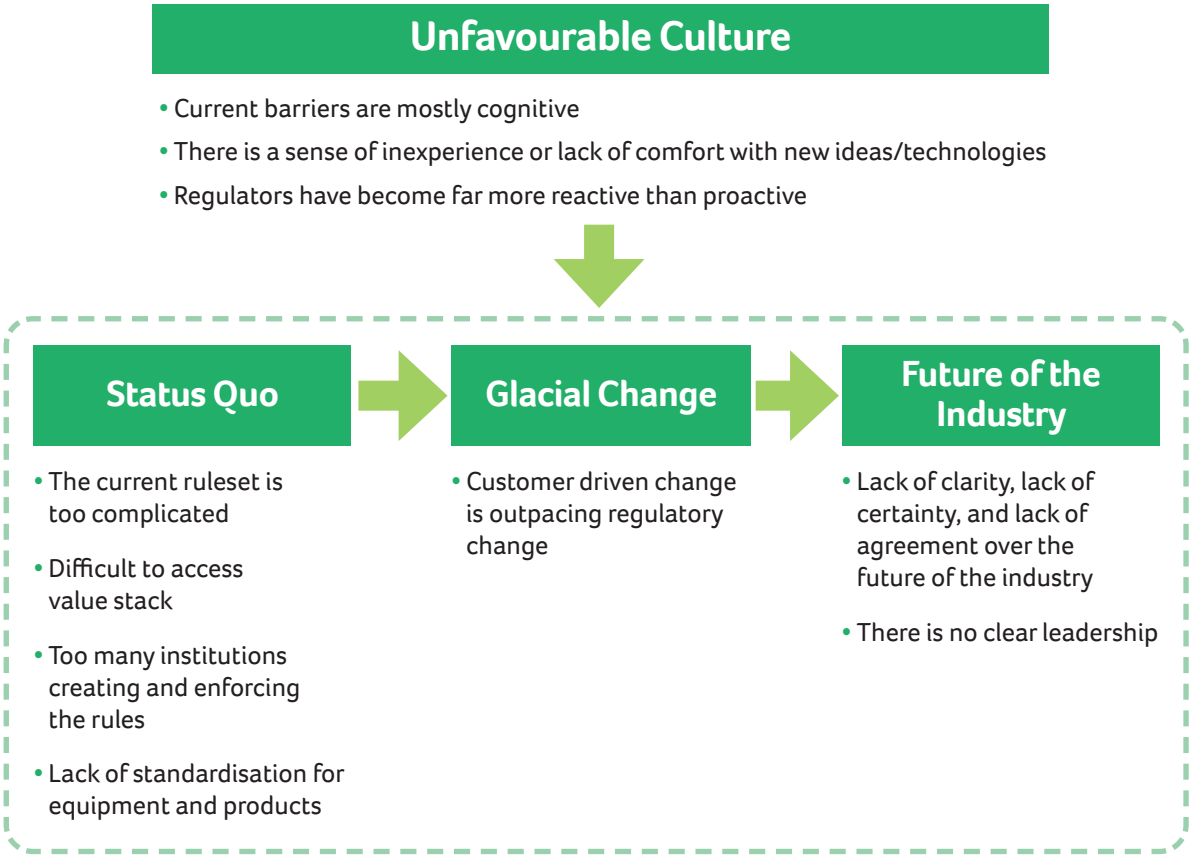
The report, *Consumer Services in Electricity Markets*[31] provided new insights into the obstacles encountered by energy service providers.

The Brattle Group found no insurmountable barriers to entry, but significant roadblocks that require a considered and cohesive policy response.

Foremost was the role of culture. The Brattle Group found a system marked by inertia. They heard about an industry resistant to change, with a 'can't do' mentality. That culture is acting as a hard brake on innovation.

31 Available at *https://energyconsumersaustralia.com.au/wp-content/uploads/Consumer-Services-in-Electricity-Markets-A-Scoping-Study.pdf*

FIGURE 15: COMMON BARRIERS TO INNOVATIVE RETAIL SERVICES



The companies interviewed also said that it is difficult to access the full value stack of energy services in the Australian market - retailers have an incentive to help customers understand and manage their bills, but not to help the network manage its costs. The companies interviewed noted that integrated utilities find it easier to realise the full value. In Australia we have disaggregated retail and networks, meaning that it is not clear that anyone in the Australian supply chain has the incentive to deliver energy management services that optimise customer outcomes. That also means that the policy and regulatory solutions in other countries will not 'cut and paste' into the Australian context – we need to identify and develop incentives that suit this market.

And finally, a lack of standardisation of household appliances and infrastructure can make it difficult to create standardised products and services, limiting customer reach. In other markets, there are clear definitions for energy efficiency and demand response programs, allowing firms to create standardised products. Lack of equipment standardisation drives up costs, while the lack of access to real-time data on energy use was also cited as a major issue.

Building a dialogue around change

Recognising that the balance of power in the energy sector is shifting to consumers, the opportunities to aggregate and manage consumer assets behind the meter becomes not just feasible but increasingly compelling.

To continue the sector's discussion on those issues that gained momentum through our 2018 Foresighting Forum, we convened two workshops with international experts, focusing on innovation in energy services.

Dr Sioshansi from Menlo Energy Economics, based in California, discussed key questions including the potential for individuals, groups or communities of consumers to be aggregated so their assets (such as solar panels or batteries) can be better utilised and rewarded, and how those larger pools of assets can be used to balance load and demand[32].

In the second workshop, Dr Ahmad Faruqi, a principal with The Brattle Group, also based in California, outlined some of the harms being perpetuated by current pricing approaches, and how those could be ameliorated by moving towards modern pricing approaches that engage consumers to reduce demand. Dr Faruqi points to other countries that have successfully made the transition[33].

Developing an industry guideline for better engaging households in energy management

To enable a dialogue with energy companies about 'better' energy management services, we commissioned the Australian Energy Foundation (formerly Moreland Energy Foundation) to develop an approach to an effective voluntary industry guideline with the objective of helping households (including vulnerable households) to manage their energy usage and take control of their bills.

AEF drew on Power Shift's research, reviewed existing programs and hardship programs, and consulted a range of organisations including energy retailers. Their logical, simple, and practical recommendations are intended to provide a benefit to everyone involved, if delivered[34].

While they are consumer-focused, each recommendation provides a benefit to everyone within the sector through more efficient (less costly) interactions, improved reputation, greater consumer retention, reduced debt levels, fewer complaints and early action, reducing the need for larger scale intervention.

Stakeholders expressed a strong preference that any guideline should be delivered through The Energy Charter[35] – an initiative through which energy businesses across the energy supply chain have committed to progress the culture and solutions required to deliver energy in line with community expectations. Around 85% of customers are supplied by energy companies (retailers) who are signatories to The Energy Charter.

AEF recommended for industry the following five areas of focus that would improve the customer experience and make a significant contribution to re-building trust and confidence in this market.

32 To see the workshop presentations, go to *https://energyconsumersaustralia.com.au/news/innovation-energy-services-workshop-1-resources*
33 To see the workshop presentations, go to *https://energyconsumersaustralia.com.au/news/innovation-energy-services-workshop-2*
34 Australian Energy Foundation, June 2019 *Scoping an effective voluntary industry guideline for helping households manage their energy use and bills* available at *https://energyconsumersaustralia.com.au/wp-content/uploads/Scoping-an-effective-voluntary-industry-guideline-for-helping-households-manage-their-energy-usage-and-bills.pdf*
35 See *https://www.theenergycharter.com.au/* for information about the Charter

1. Improving their relationships with customers

Energy companies know little about their customers outside their billing arrangements with them. If retailers are to provide customers with the least resources with the best energy service, the AEF recommends that energy companies need to:

- build a trusted relationship with their customers – including through co-designed approaches to improve on the information, programs and services;
- collect relevant information to provide a better service that could include the customer's preferred language and means of communication and understanding how many people live in the house. Improved understanding of the household means that the retailer can tailor information;
- provide tailored solutions based on that enhanced understanding.

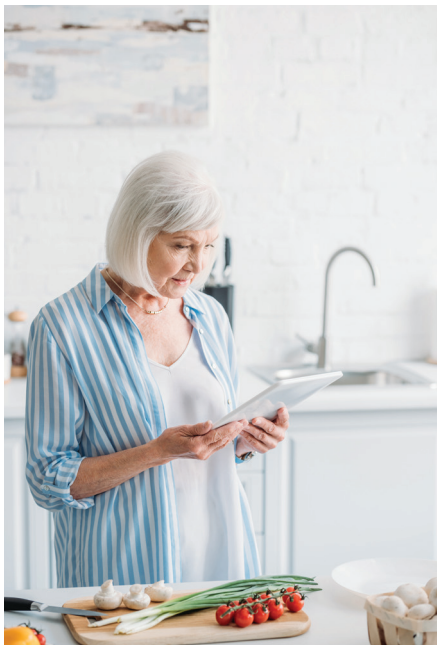
2. Information provision

The second area of focus is how energy companies communicate with their customers. A significant proportion of stakeholders noted how ineffective the bill was in helping customers understand their usage. That has been complicated by regulations that also implicitly assume a quarterly bill is the main mechanism for telling consumers about their rights and responsibilities. The AEF report therefore recommended that a guideline could focus on the following actions:

- develop simpler bills through co-design – this requires regulatory review, but allowing customers to ask for the information that is of most relevance and utility to them would seem to be a logical next step, knowing what we now do about the diversity of households[36] ;
- develop other communication options – noting that the bill is too often relied on as the only point of contact between a retailer and a customer and that digital technologies offer alternatives, there is the potential to review all communications with the customer to offer it at the time and in the medium that the customer prefers;
- Provide services to help consumers with forms where possible – for customers who need additional help and are eligible for a government grant, retailers could not only alert them to the grant, but also pre-populate forms; and
- proactively identify and apply eligible concessions – we continue to see instances of consumers who are not accessing all the concessions and rebates to which they are entitled[37]. For example, knowing the age of their customer means it is easy to check that the customer is receiving the government assistance to which she or he is entitled. This would provide a win for the consumer financially and a win for the retailer through good service delivery.

36 It should be noted that there has been work to improve bill information, including the pilot run by BETA and the Department of the Environment and Energy, looking at simplified bills – 'ways to save' information increased confidence but did not translate into an intention to look for a better offer - see *https://behavioraleconomics.pmc.gov.au/projects/electricity-information-fit-bill-redesigning-electricity-bills-support-consumer-engagement*

37 Australian Energy Regulator (2018) *Annual report on compliance and performance of the retail energy market 2017-18* (*https://www.aer.gov.au/system/files/Annual%20Report%20on%20Compliance%20and%20Performance%20of%20the%20Retail%20Energy%20Market%202017-18_0.pdf*);



3. Avoiding 'silent hardship'

A key learning of Power Shift was that a range of households are living in 'silent hardship' – those who are managing to pay their electricity or gas bills, but only by rationing their energy use to an unhealthy level or going without other essentials[38]. The AEF noted that energy companies are required to have systems in place to identify customers in financial hardship and to have programs that will assist those customers. Those in silent hardship are to all intents invisible and to address this the AEF report recommends the following priority areas for action:

- explore technology solutions to identify people in silent hardship – smart meters provide retailers with the means to identify customers who are using too little energy on very hot or very cold days;
- improve communications with consumers – being able to provide targeted information to customers who may need additional assistance;
- improve terminology to encourage participation – consider where language may be a barrier. Customers may not think of themselves as 'in hardship', particularly if they perceive this to be a short-term problem, but could still benefit from assistance; and
- take recommendations from community groups – AEF saw value in letting community and welfare workers make referrals to retailers' hardship programs.

4. Make energy management information more accessible

The AEF research found that all energy companies provided information about how to manage energy usage, and the programs in place. However, the information and programs were not easy to access, were online only and almost exclusively in English. Recommendations to improve the customer outcomes therefore included:

- make energy management information easier to find – retailers offer energy management advice to customers in their hardship programs, so why not offer it to all households?;
- make information available in different languages; and
- promote appliance replacement programs – replacing inefficient appliances can have a significant impact on reducing energy bills. Easier access and more visibility to those programs (offered by retailers and government) would be valuable assistance to households.

5. Working together

Industry and community organisations each play an important role in improving the customer experience. The report recommends that better collaboration will rebuild confidence and trust in the market.

38 This has been supported by other similar research. See for example: Queensland Council of Social Service (2019) *Living affordability in Queensland* (https://www.qcoss.org.au/publication/affordability-in-queensland-report/); and Victorian Council of Social Service (2018) *Persistent Energy Hardship* (https://vcoss.org.au/wp-content/uploads/2018/11/Persistent-Energy-Hardship-FINAL-Web-Single-Page.pdf)

B. A framework for targeting energy services and programs

In response to the complex and varied needs of households, Power Shift asked ACIL Allen to develop a framework for targeting energy services and programs, with policymakers in mind as a primary audience.

The result was the report, *The Supporting Households Framework*[39], a sophisticated multidimensional consumer segmentation framework to help industry, community groups and government deliver highly targeted programs tailored to the diverse needs of households.

As Power Shift's research found, there is no 'one size fits all' solution. No single website, single mainstream media TV campaign or solitary factsheet will reach and help every household.

To be effective, assistance and information must be delivered in a format and channel that suits the way consumers live.

The Supporting Households Framework outlines the choices a household can make that will help them manage their energy bill or their energy usage.

FIGURE 16: CHOICES AVAILABLE TO HOUSEHOLDS TO MANAGE THEIR ENERGY BILLS

It then looked at how a household might approach that decision, through identifying motivation, barriers and opportunities.

39 ACIL Allen (2018) available at *https://energyconsumersaustralia.com.au/wp-content/uploads/Supporting-Households-to-Manage-Their-Energy-Bills-a-Strategic-Framework.pdf*

TABLE 4: SUMMARY OF FACTORS THAT INFLUENCE A HOUSEHOLD'S MOTIVATION, ABILITY AND OPPORTUNITY

Motivation	Ability	Opportunity
• Attitude towards the behaviour, for example, the perceived costs and benefits, the importance of energy, and cultural considerations • Alignment with choices made within the household's circle of influence • Likelihood of success • Unwillingness to create disharmony/conflict	• Literacy, numeracy, problem solving and research skills • Language barriers • Ability to self-advocate, negotiate • Belief in the ability to succeed • Trust in others • Ability to influence behaviour of all household members • General interest in, and capability using, technology	• Type of housing • Home ownership status • Scope to manage the energy bill - for example, to choose a better energy deal, to improve the building fabric, to install more energy efficient appliances, to change the wa energy is used • Access to liquid funds

Source: ACIL ALLEN CONSULTING

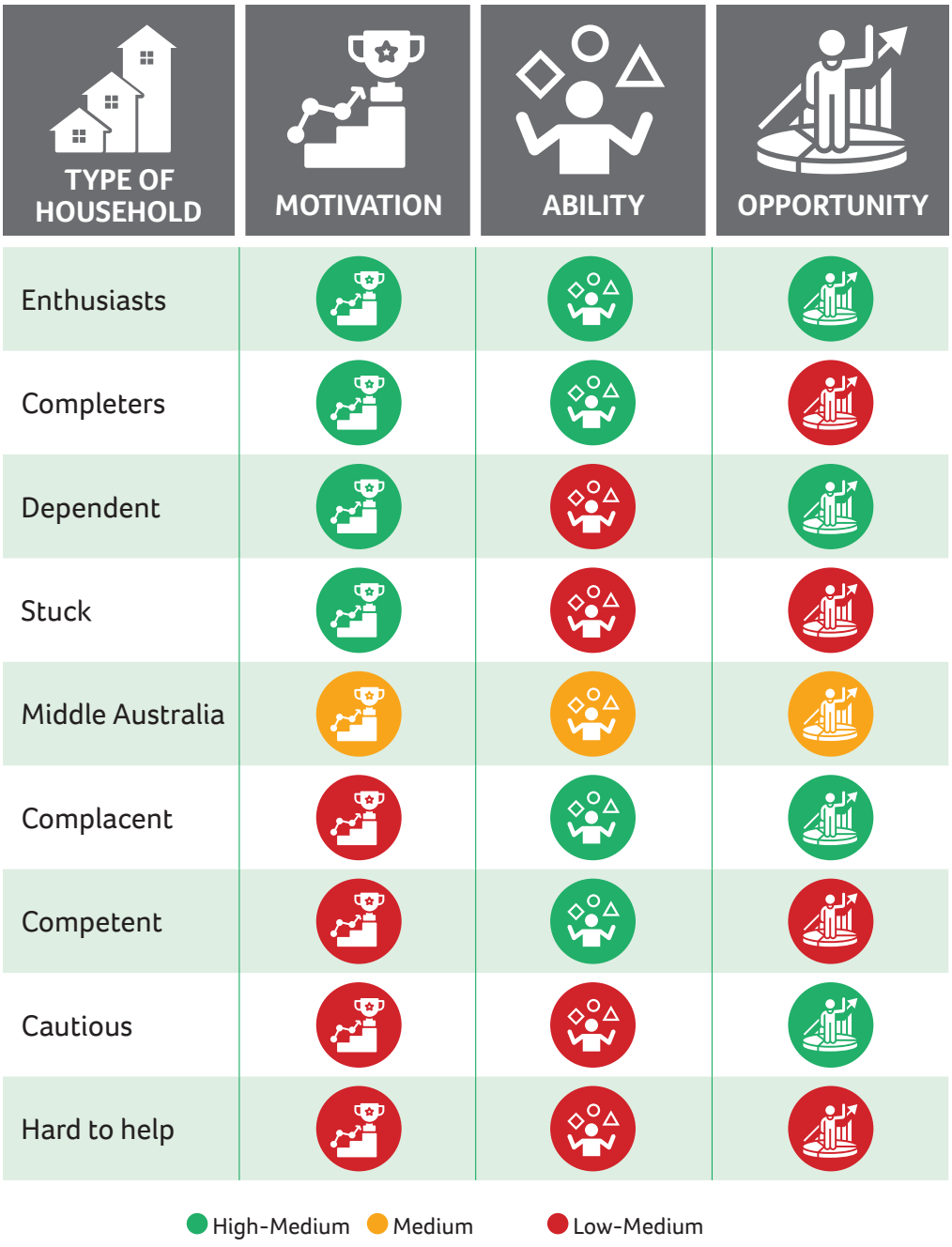
Mapping households against their motivation, ability and opportunity to manage their bills produces nine different 'household types'.

The analysis made very clear that:

- a household's motivation and opportunity can vary for each of the six choices – for example, a tenant cannot put solar panels on his/her roof, or insulate the house, but can switch to a better energy deal, or use less energy at peak times whereas a homeowner on a fixed income might be very keen to replace their inefficient hot-water system, but unable to afford it; and
- timing also has an impact on a household's capacity – once a household has chosen a better energy deal, that opportunity may no longer be available to them, at least in the short term. A family with teenage children may choose family harmony over trying to encourage them to use less energy, but once they have left home, there is greater opportunity to change behaviour to reduce energy use.

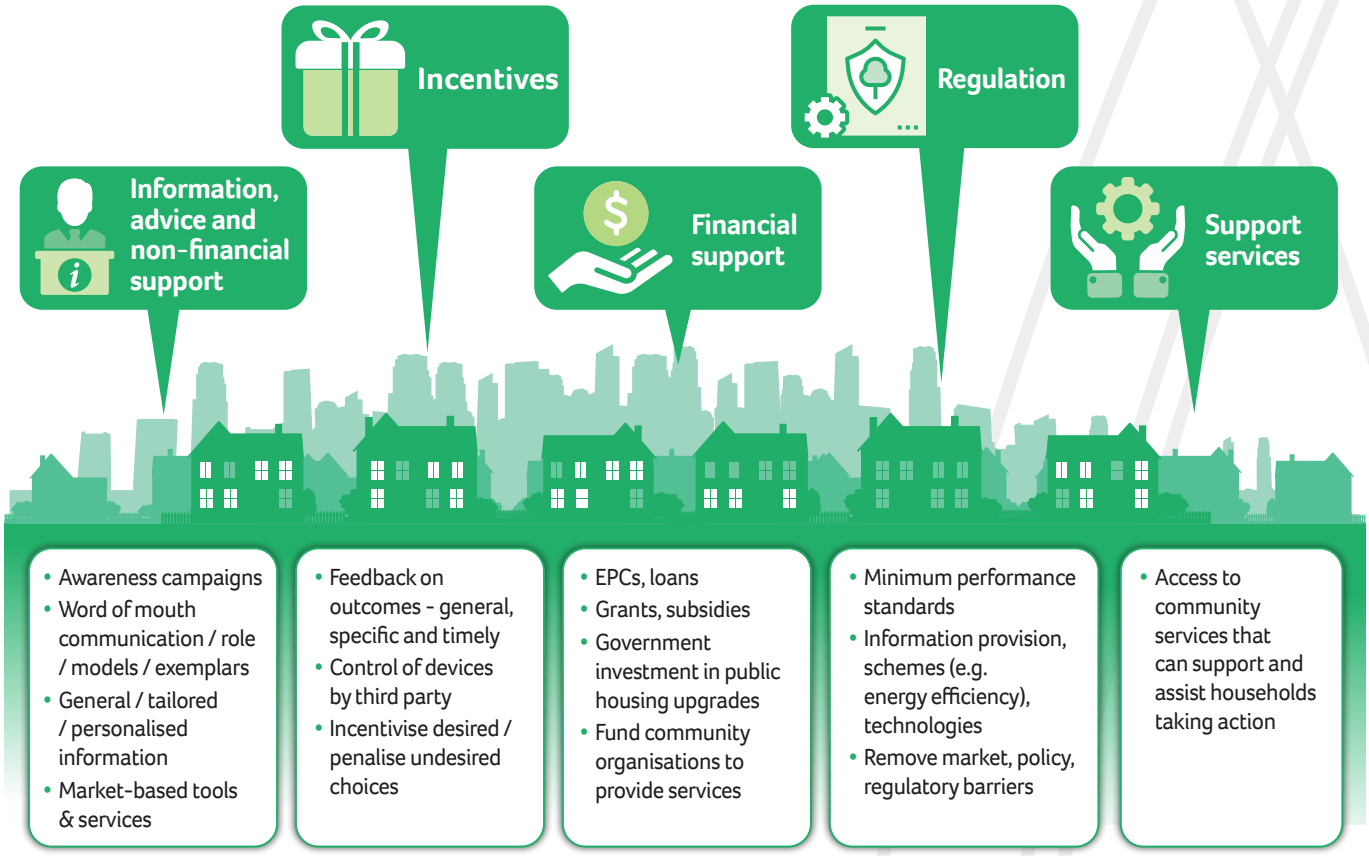
Having understood where households can or cannot act, *The Supporting Households Framework* provides an indication of which tools and services are most likely to help that household.

FIGURE 17: SEGMENTATION MODEL FOR HOUSEHOLDS MANAGING THEIR ENERGY BILLS[40]



40 We note that any classification or labelling system can be fraught – the names given to household types in this Framework was intended to convey the type of assistance each household might need to make a decision. But they might not be read that way by all audiences. While the segments can be re-named to suit your audience, we strongly caution against reassigning motivation, ability or opportunities between the segments as that will undermine the capacity of the Framework to identify effective tools and information.

FIGURE 18: TOOLS AND SERVICES TO HELP HOUSEHOLDS MANAGE THEIR ENERGY BILLS



Note: EPC = energy peformance contract

SOURCE: ACIL ALLEN CONSULTING

The benefits for policymakers and decision makers using the Framework is that they can:

- arrive at an evidence-based solution to consumer needs, which can be used to assess the likely effectiveness of different solutions or ideas that are being floated for consideration;
- remove the `guesswork' of what will or won't work when giving advice or designing and implementing new tools and services; and
- put the needs and preferences of households at the front and centre of decision making and provide a common frame of reference for understanding how decisions are being made in the best interest of consumers.

A Policymakers Guide to the Supporting Households Framework[41] was also developed to assist and support policymakers in using the Framework, to think outside the box and embrace a tailored consumer-centric approach.

41 Available at https://energyconsumersaustralia.com.au/wp-content/uploads/A-Policymakers-Guide-to-using-the-Supporting-Households-Framework-Jul2019.pdf

Demonstrating the value of consumer-led design

To transform the innovative *The Supporting Households Framework* from the conceptual to the practical, the Power Shift project team engaged the energy community to develop real-life applications that could be used by policymakers, industry and community groups. Resource and time constraints meant that we focused on delivering information tools (the first of the five categories of tools and services identified), but *The Supporting Households Framework* provides guidance on the full range of tools and services most likely to support consumers.

These applications were specifically aimed at:

- identifying consumer segments that are impacted by market or regulatory failures;
- identifying policy options to address the impact of market or regulatory failures on consumers;
- identifying the gaps in the existing sources of assistance to consumers; and
- guiding the design of exemplar resources and tools across four consumer groups, to showcase how the segmentation framework assists with tailored communications from trusted sources/partners.

Power Shift workshops

Working with the strategic communications agency 89 Degrees East, we facilitated six face to face workshops and two national online workshops with a total of 89 participants working in this space from across governments, energy regulators, energy industry, Ombudsman's offices, advocacy organisations, service providers and consumer support organisations.

The workshops provided participants with an overview of *The Supporting Households Framework* before working through the practical application of this framework.

State and Federal jurisdictions have already started applying the framework to their policy deliberations. Agencies such as the Federal Department of the Environment and Energy (DEE), the Victorian Department of Environment, Land, Water and Planning (DELWP), Essential Services Commission of Victoria, and the Victoria-based Consumer Policy Research Centre have all reported using the framework.

As a result of co-design workshops across March 2019 in Brisbane, Sydney, Melbourne, Hobart, Cairns and Bathurst, and two national online forums, we were able to identify immediate demand for new information and tools that apply the framework to connect with hard-to-reach households.

New resources for consumers

A strong consensus across all Power Shift workshops led to four consumer groups being chosen for partnering with Energy Consumers Australia in developing exemplar resources. Trusted sources for each group were enlisted as partner organisations, and then specific sections of the consumer groups were targeted for the resources. The outcome was 20 exemplar resources as outlined in Table 5.

TABLE 5: SUMMARY OF INFORMATION RESOURCES

TARGET GROUP OF CONSUMERS	FOCUS	DELIVERY PARTNER
Low Income Households	Low income homeowners	Financial Counselling Australia
Low Income Renters	Younger and first time renters	Tenant advice organisations
Older People	Low digital literacy skills and/ or not engaged	Council of the Ageing
Indigenous Australians	Regional and remote communities	Indigenous Consumer Assistance Network

The resources were tailored in content, design, format and distribution channels. They include a series of step by step brochures/fact sheets, videos for social media, an online training module for frontline workers, train the trainer presentations and the distribution of kits containing practical tools to assist with home energy savings (such as energy saving light bulbs, draught stoppers and gap seals).

These tools and products are `white-labelled' - or unbranded - and produced specifically for use by third-party stakeholders who are invited to use their own branding to distribute the material. Any consumer-facing organisations looking to utilise and co-brand these resources can contact Energy Consumers Australia.

SECTION FOUR: RECOMMENDATIONS AND CONCLUSION

A. Recommendations

Power Shift started with the premise that empowering consumers enables them, if they choose, to actively take control over their energy costs.

As this report demonstrates, through the body of work and engagement undertaken through Power Shift in the last three years, we are now better informed about what works in shifting the power to consumers. We are also more aware of the barriers to consumers being confident that the actions they take will allow them to make their home comfortable while having control over their energy bills.

There are opportunities to now take the work of Power Shift further.

TARGETED SUPPORT FOR LOW INCOME HOUSEHOLDS

Through Power Shift, and through our regular Energy Consumer Sentiment Survey, it is evident that there is currently a lack of information and tools to empower consumers to manage their energy use. We are on the cusp of realising the significant potential for digital technology and applications to provide new opportunities to communicate with consumers in a way that enables and supports active decision making. However, as Power Shift has shown, households are diverse and engagement needs to be bespoke and targeted if the benefits are to be realised on any scale, including by households facing additional barriers (such as low-income, English as a second language, or inability to make modifications to their building envelope).

Consumers have told us that they are not confident they have the information, advice and tools required to make the changes required – but if we provide these things through a 'trusted source' they will be more likely to listen and act on them.

The ACCC recommended (Recommendation 38) in its Retail Electricity Pricing Inquiry that:

> *In addition to existing funding, the Australian Government and the relevant state or territory government should fund (to a value of $5 per household in each NEM region, or $43 million NEM-wide, per annum) a grant scheme for consumer and community organisations to provide targeted support to assist vulnerable consumers to improve energy literacy. This grant scheme should be modelled on the approach taken by the Queensland Council of Social Services in administering the Switched On Communities program. This targeted support will assist vulnerable consumers to participate in the retail electricity market and choose an offer that suits their circumstances.*

Energy Consumers Australia sees this as a priority: to provide tailored, relevant and timely assistance to vulnerable households, and help rebuild consumers' trust in this market by engaging and resourcing trusted voices to provide consumers, particularly hard to reach consumers, with advice and help.

RECOMMENDATION 1

COAG Energy Council should agree to implement Recommendation 38 of the Australian Competition and Consumer Commission's Retail Electricity Pricing Inquiry, by establishing a grant scheme to provide targeted support for low income households to manage their energy bills.

EXTEND SUPPORT FOR SMALL BUSINESS

The work we undertook through Power Shift showed how energy management for all consumers, not just households experiencing cost-of-living pressures, is an opportunity to both address affordability and the challenges of managing an energy system that is more flexible, in both demand and supply. Our stakeholder consultation has identified that if small businesses are to remain competitive, and continue to be the engine for employment growth, there is an opportunity to undertake a similar research program as Power Shift for the small business sector.

As the Australian Competition and Consumer Commission (ACCC) found in its Retail Electricity Pricing Inquiry, small businesses consistently over-pay for energy, being on higher priced offers with a significant proportion not switching energy provider in the last 2-4 years. A first step has been taken with the introduction of the Business Energy Advice Program in August 2019. However, as Power Shift has shown, energy choices are more than choosing an energy provider but also having some control over how much energy is used and when, and having opportunities to use technology and improve the built environment.

RECOMMENDATION 2

COAG Energy Council, together with Small Business Ministers, should consider options for how the research from Power Shift could be applied and extended to benefit small business.

EFFECTIVE COLLABORATION AND INFORMATION SHARING

It has been evident throughout the Power Shift project that there is a wide range of research, programs and service delivery being undertaken throughout Australia and internationally. That work is being done by researchers and officials who may not be working within the energy sector. Energy Consumers Australia has benefited greatly from being able to share and collaborate with a range of stakeholders about their work. We see value in this being continued through establishing networks, to both share information and program learnings more generally, and to collaborate and extend the framework for targeting consumers developed through Power Shift.

RECOMMENDATION 3

COAG Energy Council could establish an ongoing workstream or platform for sharing information and collaboration on energy management research, programs and services.

DEVELOP NEW MEASURES TO EMPOWER CONSUMERS

Power Shift has demonstrated that measures to empower consumers to manage their energy use and take control over their costs are more effective when they are designed using evidence of the diversity of consumers in their motivation, ability, and opportunity when making decisions. *The Supporting Households Framework* is a holistic approach that informs how measures might be better targeted to reach a wider group of consumers, beyond narrow segments such as early adopters or households being assisted through energy concessions and safety nets.

RECOMMENDATION 4

Given the Australian Government's active involvement in the development of *The Supporting Households Framework*, that it lead a network of officials within the COAG Energy Council Working Groups to demonstrate the value of the Framework, encourage its use in the development of measures to empower consumers in managing their energy use and taking control of their bills , and continue to develop an understanding of household needs and preferences.

CAPTURE THE WIDER BENEFITS OF ENERGY MANAGEMENT

Australia is the first country to have built on the IEA co-benefits framework to tailor it to the Australian climate and energy market, to enable an assessment of the wider benefits of energy efficiency. The adoption of a shared approach to the capturing of the wider benefits of energy efficiency measures, such as the *Multiple Impacts of Energy Efficiency* framework, is an opportunity for governments to communicate the value not only in improving affordability but reducing the societal costs of poor health and social exclusion.

As we move to a more flexible energy system, where consumers are active participants that may not only use less energy, but shift when they use energy into off-peak periods, there would be value in extending the evidence base in the *Multiple Impacts of Energy Efficiency* framework to include energy management.

RECOMMENDATION 5

COAG Energy Council members should adopt a shared approach to capturing the wider benefits of energy management, building on the foundation provided by the *Multiple Impacts of Energy Efficiency* framework. The Australian Government should continue to be a participant in the International Energy Agency's dialogue for considering the opportunities and barriers to energy management, through sharing the Australian experience.

IMPROVE ENERGY EFFICIENCY IN AUSTRALIAN HOMES

Power Shift has shown that the energy performance of Australian homes, and major appliances used for heating and cooling, have a significant impact on energy affordability and household health and wellbeing. There is scope to for all governments to work with the building industry, major retailers and consumer bodies to make even greater in-roads into reducing energy demand (and use) through making all Australian homes more energy efficient.

RECOMMENDATION 6

COAG Energy Council, through its Trajectory for Low Energy Homes, should continue to engage with industry and consumers to prioritise the need for measures to address the high energy costs that are the result of poor energy efficiency of Australian homes.

FURTHER DEVELOP AND IMPLEMENT A VOLUNTARY GUIDELINE ON ENGAGING HOUSEHOLDS

The Energy Charter is an initiative of energy businesses across the energy supply chain to progress the culture and solutions required to deliver energy in line with community expectations. The work through Power Shift has demonstrated the importance of culture in achieving innovation and better outcomes for consumers in managing their energy costs.

The AEF scoped the potential elements of a voluntary guideline for better engagement with households in energy management, through dialogue with stakeholders including energy companies.

The Energy Charter could be an appropriate forum in which to collaborate to fully develop a voluntary guideline to be adopted widely by energy businesses, who have customer facing services and programs that encompass energy management.

RECOMMENDATION 7

The Energy Charter consider the Power Shift work on developing a voluntary guideline for engaging households on energy management, and how it could be further developed and implemented.

B. Conclusion

Energy Consumers Australia developed the seven recommendations in this report as opportunities at a national and international level to embed and extend the Power Shift research that has been undertaken over the last three years. To achieve the long-term outcome of empowering consumers to manage their energy use, all governments (including through the COAG Energy Council) and industry (including through The Energy Charter) must continue taking action to support consumer-centred decision-making. The potential benefits in both affordability, and in securing a low emissions future, are immense.

Energy Consumers Australia continues to take the work of Power Shift forward. We are in the process of developing a new work program that will include a focus on consumers with the least resources being provided with the best energy services.

We continue to adapt our Energy Consumer Sentiment Survey. In 2020 we will investigate the opportunity to use the survey to gain greater insights into consumer behaviour and decision-making by asking households and businesses about their drivers and experiences. This will be linked to our participation in the three-year Australian Research Council Linkage Grant *Digital Energy Futures* research project, which is being led by Monash University in partnership with Ausgrid, Ausnet Services and Energy Consumers Australia.

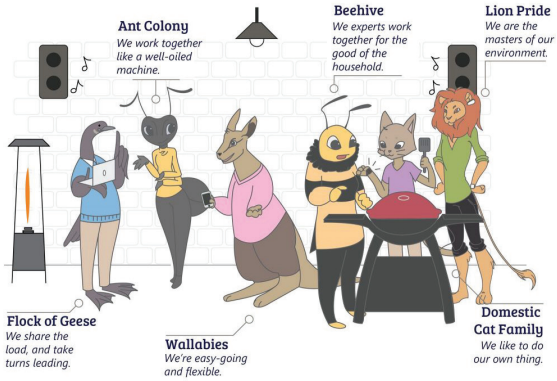
Our next stage of the Power Shift work will also be informed by the Foresighting Forum to be held in February 2020, which is focusing on a consumer vision for the future energy system.

As we have done throughout the Power Shift project, we will continue to engage in dialogue and research in collaboration with stakeholders and look forward to this next stage of the journey.

Appendix A Selective bibliography

The period in which Power Shift ran coincided with an abundance of new research in Australia and internationally looking at similar issues.

The following list is not exhaustive, but highlights the research we found particularly influential, through building a better understanding of consumers, and the challenges and opportunities in designing tools, information and services to help households manage their energy use.

AREA OF RESEARCH	AUTHOR AND URL	KEY FINDINGS
DIVERSITY OF HOUSEHOLDS	Russell-Bennett, R., Mulcahy, R., McAndrew, R., Letheren, K., Swinton, T., Ossington, R., & Horrocks, N. (2017) ***Taking advantage of electricity pricing signals in the digital age: Householders have their say. A summary report.*** Brisbane: Queensland University of Technology. *https://energyconsumersaustralia.worldsecuresystems.com/grant-archive/821-changing-needs-energy-consumers*	• Demonstrated – in a new and engaging way - how different households make decisions, gather information and use technology.  • An ant colony has a single person making decisions but work together. A beehive household work together, with everyone bringing expertise. A flock of geese is an adaptable household, where leadership may rotate. Wallaby households resist rules and share decision-making. Domestic cat families value comfort and independence and are all engaged in the decision. Lions like to figure things out by themselves – unlike cats, they will seek out information. • Survey of 1345 households across Australia, and face to face interviews with 45 households (118 people).
DIVERSITY OF HOUSEHOLDS	Nicholls, L & Strengers, Y (2015) ***Changing demand: Flexibility of energy practices in households with children, Final report*** Centre for Urban Research, RMIT University, Melbourne, Australia. *https://energyconsumersaustralia.worldsecuresystems.com/grant-archive/623-energy-practices-in-larger-households* and *https://cur.org.au/blog/feral-oclock-families-struggle-shift-energy-use/*	• To understand what changes larger households have made to their energy use, and how inflexible household energy practices are at different times of the day, researchers conducted in-depth interviews with 44 households with children in NSW and Victoria and surveyed another 547 households with children nationally. • Most respondents identified the typical peak period as the same time as homework, bath time, preparation for dinner, and preparing for bed. Parents described it as 'feral o'clock' or 'crazy time'. • Many household routines are fixed, and not likely to change. Moving activities to later in the night wasn't seen as practical. Just under half the parents surveyed who were on a time of use tariff were already shifting their usage. • Households also said they would disrupt their routines occasionally in response to a 'peak alert' – 85% of those surveyed would do so with no financial penalty or reward.

AREA OF RESEARCH	AUTHOR AND URL	KEY FINDINGS
HOUSEHOLDS RESPONSE TO NEW TECHNOLOGY	Nicholls L, Strengers Y & Tirado S (2017) ***Smart home control: exploring the potential for enabling technologies in vulnerable, disengaged and regular households*** Centre for Urban Research, RMIT University, Melbourne, Australia. *https://energyconsumersaustralia.worldsecuresystems.com/grant-archive/788-smart-home-control*	• Forty households in Victoria and South Australia were given a smart switch and two smart light bulbs to install. Households reported a higher level of difficulty, and limited benefits – of the forty, 24% tried to install at least one of the devices, but couldn't. Another 24% installed them but didn't use them. 26% of households didn't take them out of the box and only ten were actively using the devices on an ongoing basis. • Six Victorian households were given a smart plug to install and test while being observed. All of them encountered difficulties and only half completed the installation process. • The research found technology enthusiasts, men and vulnerable households were more likely to successfully install and use the devices. Some expressed concern about more digital technologies in their home, and most participants over 55 years did not use the device. • For the smart control to work smoothly, all household members needed a smartphone and internet to access the app. That is simply not possible or is unaffordable for some vulnerable households.
HOUSEHOLDS RESPONSE TO NEW TECHNOLOGY	Hargreaves, T and Wilson, C (2017) ***Smart Homes and their Users*** SpringerBriefs in Human-Computer interaction, Springer *https://www.springer.com/gp/book/9783319680170*	• Smart homes collect and analyse data, relay information to users and service providers, and enable the management of a home's appliances, lighting and heating. Smart home technology allows that management to be automated, and controlled remotely through smartphones or computers or wall-mounted controls. • Allowing an energy company to respond to real-time information about the household enables a household's demand to be managed, shifted or curtailed in response to supply and network constraints. • The research underlined the need for industry to understand households' habits and routines as they design smart home technologies, not just to fit in with their everyday lives, but also in ensuring inter-operability across appliances. Households also needed support, requiring training of electricians, engineers and plumbers, who are critical to shaping the household experience. • Hargreaves and Wilson found little evidence to suggest that the technology was generating significant energy savings or encouraged households to change their daily routine. They recommended three possible strategies to ensure that the household and systemic benefits of smart home technologies are realised – first is clear policy guidelines to ensure smart home technologies can talk to smart meters and to utilities during peak periods. Second, there need to be energy optimisation design features that mitigate any energy intensification – for example alerting households when a certain threshold is reached. Third, there need to be clear messaging to users that the technology alone will not result in energy and cost savings: unrealistic expectations will undermine consumer trust in the technology.

AREA OF RESEARCH	AUTHOR AND URL	KEY FINDINGS
ENSURING VULNERABLE HOUSEHOLDS AREN'T LEFT BEHIND	DEFG, February (2018) ***The Long Struggle Continues: Improving Service to Low-Income Customers in the Utility Sector*** *http://defgllc.com/publication/the-long-struggle-continues-improving-service-to-low-income-customers-in-the-utility-sector/*	• Built on survey data of over 1000 low-income Americans, conducted with members of the Low-Income Energy Issues Forum. • Majority of low-income consumers have taken actions to reduce their energy bills, contrary to the abiding assumption that those consumers are disengaged. • The challenge is not engagement, but the programs and policies to assist these households. • Majority of these consumers were interested in additional types of payment assistance or arrangements, with most (39%) opting for a flat bill that offers a guaranteed monthly bill amount. The next most popular (21%) was rewards-based, to save money and lower bills. • Nearly half (45%) nominated email as their preferred format for daily account information.
ENSURING VULNERABLE HOUSEHOLDS AREN'T LEFT BEHIND	Australian Council of Social Service (ACOSS) and Brotherhood of St Laurence (2018) ***Energy Stressed in Australia*** *https://www.acoss.org.au/wp-content/uploads/2018/10/Energy-Stressed-in-Australia.pdf*	• Electricity prices have increased by 117% (or 76% in real terms) over the last 10 years. Gas prices have gone up by 89% (or 53% in real terms). • Households on lower incomes are more likely to experience energy stress, spending disproportionately more of their income on energy. • While the percentage of income spent on energy has increased across all household quintiles, middle and higher income households have been able to better manage increases, through installation of solar PV or purchasing more efficient household appliances. • People on Newstart and similar allowances pay disproportionately more of their household income on energy, as do people on lower incomes – despite using less energy on average. • Low-income renters are particularly vulnerable – coupled with their housing costs, those households are under immense financial stress. • The report recommends immediate action to reduce energy prices, and more effective measures for assistance, including increasing Newstart, investing in energy efficiency measures, and introducing a grant scheme for community and consumer organisations to provide targeted support to vulnerable consumers.

AREA OF RESEARCH	AUTHOR AND URL	KEY FINDINGS

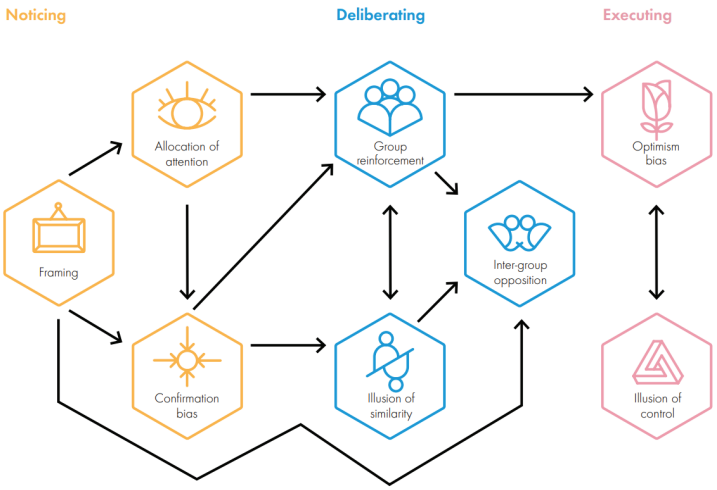
ENSURING VULNERABLE HOUSEHOLDS AREN'T LEFT BEHIND	Queensland Council of Social Service (2017)
	Choice and Control? The experiences of renters in the energy market
	https://www.qcoss.org.au/publication/choice-and-control-the-experiences-of-renters-in-the-energy-market-primary-tabs-viewactive-tabeditrevisions/
		• Report outlined several barriers to participation in the energy market faced by renters, including:
		  • Access to information - renters have little or no information about the energy performance of their dwelling;
		  • Controlling their energy costs - renters are unable to easily make changes to the fabric of the house or change major appliances, and as they perceive little benefit, landlords have little incentive to improve energy performance;
		  • Accessing consumer protections - renters are more likely to encounter non-standard supply arrangements, such as embedded networks (in units or caravan parks). Intersection between energy and tenancy legislation creates complexity and confusion.
		• Those problems are exacerbated by tight rental markets, where tenants, particularly those on low-incomes, may be unable to take energy features of a property into account.
		• The needs of tenants as a distinct consumer cohort must be considered, and the interaction between energy/tenancy regulation. Addressing these issues requires coordination between national and state stakeholders in housing and energy.

ENSURING VULNERABLE HOUSEHOLDS AREN'T LEFT BEHIND	Victorian Council of Social Services (2017)
	Power struggles: everyday battles to stay connected
	http://vcoss.org.au/policy/power-struggles-everyday-battles-to-stay-connected/
		• The research looks at the experience of low-income households who are struggling to stay connected, and for whom payment of their utility bills means going without food, or reducing heating, cooling and lighting.
		• Researchers interviewed 10 households in Victoria.
		• Key themes included:
		  • Sole adult and sole parent households particularly vulnerable;
		  • Poor housing added to energy bills;
		  • The nexus between energy and health – most of the interviewees had health issues that were exacerbated by inadequate heat or cooling;
		  • The trade-offs made to maintain connection to energy included restricting heating or cooling, and limiting cooking and food purchases;
		  • People did not trust the energy sector – households expressed feelings of frustration, anger, disadvantage and/or powerlessness;
		  • Vulnerability to financial shocks – people had little capacity to absorb unexpected costs, relying on credit through formal and informal (family/friends) arrangements, or assistance from community organisations.
		• To address these challenges, VCOSS recommended:
		  • Increased income support;
		  • Minimum energy performance standards for private rental housing, expansion of retrofits, long-term energy efficiency programs, review of tenancy legislation;
		  • Review of concessions;
		  • Market reform including better retailer assistance, improved price transparency in Victoria, introduction of an independent energy broker for residential consumers.

AREA OF RESEARCH	AUTHOR AND URL	KEY FINDINGS

ENSURING VULNERABLE HOUSEHOLDS AREN'T LEFT BEHIND	Nicholls L., McCann H., Strengers Y. & Bosomworth K. (2017)
	Heatwaves, Homes and Health: Why household vulnerability to extreme heat is an electricity policy issue
	Centre for Urban Research, RMIT University, Melbourne
	https://energyconsumersaustralia.worldsecuresystems.com/grant-archive/813-electricity-pricing-and-managing-heatwaves-at-home-mitigating-health-and-financial-risks-for-hea
		• The research highlighted that people in poor quality housing have limited capacity to manage extreme heat:
		  • Renters are particularly affected;
		  • Older consumers can underestimate the risk of exposure to extreme heat;
		  • Extreme heat can exacerbate problems for people with chronic health issues.
		• Worry about high bills leads to unhealthy rationing of electricity, particularly in older households. That is a rational concern for households already struggling with high bills.
		• Current concessions are not sufficient to mitigate adverse impacts.
		• Recent public debate on energy issues has caused distrust and confusion, limiting the effectiveness of public messaging. The most vulnerable may restrict usage to an unhealth level in response.
		• Electronic billing and direct debits can further limit household engagement with their energy bills, and communications.
		• CALD households face additional challenges, that are not well understood.

ENSURING VULNERABLE HOUSEHOLDS AREN'T LEFT BEHIND	Willand, N (2019) ***Integrating energy efficiency and hardship improvements into the Care at Home system***	• The research took place at a time when there was a public debate around three intersecting issues: quality of care for older people to stay in their homes; the poor energy efficiency of Australian housing stock; and rising energy prices. • The research focused on the potential for the Care at Home system to help deliver support to older Australians. • About 285,000 Australians over 65 years are in energy hardship, meaning they're unable to provide basic energy-related needs around heating or cooling. • Their problem is exacerbated by poor housing, rising energy prices and low incomes. • Home care providers do not currently provide any advice or assistance on energy hardship. • The researcher consulted with energy and health agencies, mapping a consumer's journey through the aged care system, and noting that there were opportunities to identify symptoms of energy poverty. • Healthcare providers have limited capacity and knowledge on energy issues, so the research proposed appropriate ways of assistance.

AREA OF RESEARCH	AUTHOR AND URL	KEY FINDINGS
HELPING CONSUMERS CHANGE THEIR HABITS	OECD (2019) ***Delivering Better Policies Through Behavioural Insights: New Approaches*** *https://www.oecd-ilibrary.org/governance/delivering-better-policies-through-behavioural-insights_6c9291e2-en*	• Behavioural insights (BI) provides a methodology to generate evidence on how people behave, enhancing the analysis, design and delivery of public policies. It also provides a cost-effective methodology to test multiple policy responses at once. • Governments and organisations are increasingly using BI. • Key insights for policymakers included: • Understanding individual decision-making, noting the need for longer-term monitoring and research on how households are responding to new initiatives such as smart meters. • The role of organisational culture in decision-making. • How BI could be applied more widely to test and trial initiatives to understand what will be effective.
HELPING CONSUMERS CHANGE THEIR HABITS	The Behavioral Insights Team (various) Over Power Shift, the BI Team published a range of reports that informed our thinking, including ***Evaluating the Nest Learning Thermostat* (2017)** *https://www.bi.team/wp-content/uploads/2017/11/311013-Evaluating-Nest-BIT-Exec-Tech-Summaries.pdf* ***BI Team Annual Update Report* (2017-2018)** *https://www.bi.team/publications/the-behavioural-insights-team-annual-report-2017-18/* ***Behavioural Government* (2018)** *https://www.bi.team/publications/behavioural-government/*	• NEST Home Energy Management achieved gas savings overall on average between 6-7% of heating systems, and 4.5-5% of total annual household gas consumption. Savings were achieved with no perceived loss of comfort. • Scaling up though would require a more sophisticated model of energy use, including dynamic assumptions about what a household would need. • BI Team's trial with OFGEM to encourage disengaged consumers to consider switching to a better deal saw customers who switched after receiving a letter save £50. • Government officials are themselves influenced by the same heuristics and biases that they are trying to address in others. • The report unpacks how officials *notice* information and ideas, how they consider policy ideas (deliberating), and how policy intentions are translated into action (executing). 

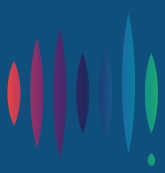
AREA OF RESEARCH	AUTHOR AND URL	KEY FINDINGS

TOOLS AND INFORMATION TO HELP CONSUMERS	AGL (2018)
	
	AGL Energy Insights
	
	Chris Clarke and Teresa Lee from AGL presented on the findings from the pilot at the 2018 Foresighting Forum – the presentation and slides can be downloaded from
	https://energyconsumersaustralia.com.au/news/foresighting-forum-2018-multimedia-publications
	
	For information about the $300m customer experience transformation program see
	https://thehub.agl.com.au/articles/2018/11/how-energy-retailers-can-be-disruptors-too
		• AGL, one of the big three Australian retailers, announced a $300m customer experience transformation program in August 2016.
		• One of the customer services developed was their Energy Insights, available to customers with smart meters, that provides customers with feedback on energy use by appliances.
		• AGL ran a pilot, beginning with asking customers to help understand the problem – they heard that customers:
		  • find energy bills complex and hard to understand;
		  • want to know which of their appliances used more energy – customers have no way of knowing whether an hour of lighting uses the same amount of energy as an hour of TV;
		  • seek control, but don't know where to start;
		  • do not see value for money.
		• A pilot was conducted with 3000 customers which were sent a personalised report, created from smart meter data as well as other inputs, including a home profile and contextual information such as weather.
		• The report was sent to customers midway through their bill-cycle and a few days after they'd received the bill. Communications included tips on how to manage energy in their highest cost appliances, as well as information about weather and how they compared to similar homes. There were multiple iterations to seek customer feedback.
		• The customer response was overwhelmingly positive – over 90% of customers reported they found Energy Insights useful. Those customers valued transparency – the reports helped them identify what was 'waste', and opportunities to save energy.
		• About a third of customers indicated they would take action on the receipt of the report.
		• Customers were very engaged, more interested and found the reports useful ways to engage the household.
		• AGL has now rolled out the product to smart meter customers.

AREA OF RESEARCH	AUTHOR AND URL	KEY FINDINGS
TOOLS AND INFORMATION TO HELP CONSUMERS	BETA The Behavioural Insights team in the Australian Government undertook two research projects that were relevant to Power Shift. ***Energy labels that make cents* (March 2018)** *https://behavioraleconomics.pmc.gov.au/projects/energy-labels-make-cents-randomised-controlled-trial-test-effect-appliance-energy-rating* ***Saying more with less: Simplifying energy factsheets to improve consumer understanding* (March 2018)** *https://behavioraleconomics.pmc.gov.au/projects/simplifying-energy-fact-sheets-improve-consumer-understanding*	• The first research project looked at the impact of energy labelling on consumers' decision to purchase an energy efficient appliance. • Recognising that inefficient appliances cost more to run and contribute greater emissions, BETA partnered with the Australian Government Dept of the Environment and Energy and Appliances Online to test what could encourage consumers to buy more energy-efficient appliances online. • BETA conducted a Randomised Controlled Trial to assess the impact of the current label and designed an alternative energy label using behavioural insights – particularly to overcome a propensity to discount future benefits, and the difficulty in comparing multiple options with multiple attributes. The alternative label was therefore simpler and focused on the money they could avoid losing by buying a more efficient appliance, expressed in dollar terms. • BETA found that energy labels have positive effects. The alternative label had similar impact as the current label – a possible explanation may be the way information was presented, where framing information as 'avoided costs' may have been confusing. • The second research project *Saying more with less* was conducted with the Australian Energy Regulator to test whether a fact sheet improved people's engagement, likelihood to switch, and confidence in making a decision. • BETA designed five energy fact sheets – around 4500 respondents in an online survey preferred all five BETA fact sheets to the existing AER fact sheet. Participants found the BETA fact sheets easy to understand, helpful in comparing plans and making decisions.
RELEVANT PILOTS AND TRIALS	Jemena ***Power Changers Pilot*** For more information, see *https://jemena.com.au/about/innovation/power-changers-community-connections-program/power-changers-pilot*	• Jemena owns energy and water networks across northern Australia, and the east coast of Australia. It owns an 11,000 km electricity network in north-west Melbourne, delivering electricity to more than 343,000 homes and businesses. As a regulated network, Jemena has limited contact with those customers – the customer would typically go to the retailer to talk about energy. • Power Changers was a demand response trial that ran over four months, beginning in December 2017, and provided incentives to consumers to reduce their consumption on very hot days (when households can use three times more electricity than usual). • Power Changers used a customer's smart meter to set individual household targets, deliver electricity consumption data to participants and monitor savings. Participants were given a new smart phone app and web portal. • Participants engaged in multiple 'learn and earn' challenges (quizzes or watching videos) that delivered information about how to manage their energy use and costs. • On average, households reduced peak electricity consumption 26-35% in Demand Response (DR) Challenges on hot days. Participants in each DR challenge ranged between 43-53%. • The pilot trialled community incentives and cash rewards – the latter were most effective but attracted a different segment of participants.

AREA OF RESEARCH	AUTHOR AND URL	KEY FINDINGS

RELEVANT PILOTS AND TRIALS	Australian Renewable Energy Agency (ARENA)
	Demand response projects
	The reports for each pilot can be accessed in ARENA's Knowledge Bank at Australian Renewable Energy Agency (ARENA) at
	https://arena.gov.au/knowledge-bank/?technology=demand-response
	See also ThinkPlace's report in 2018 on the pilots' experience over the first summer Demand Response Customer Insights Report, available at
	https://arena.gov.au/assets/2018/08/demand-response-consumer-insights-report.pdf
		• Australian Renewable Energy Agency (ARENA) and Australian Energy Market Operator (AEMO) piloted a demand response initiative, trialling a series of initiatives over three years to see how innovative sources of demand response could be delivered in emergency situations – when there was insufficient supply in the National Electricity Market to meet demand.
		• 10 projects were funded over three years, to test different approaches. Three of the projects responded to a call on 24-25 January 2019:
		  • EnelX curbed energy use over 50 commercial and industrial sites;
		  • United Energy slightly reduced the voltage at substations, providing a load reduction without any noticeable impact on customers;
		  • PowerShop used its 'Curb Your Power' program to encourage its customers to reduce their energy use – when they hit a reduction target, they were rewarded with a power credit.
		• ThinkPlace's assessment of customer responses included:
		  • Demand response competes with other family priorities;
		  • Short, event-based demand response does not assist customers with their concern about costs overall;
		  • People are keen to learn how to save energy;
		  • People were keen to contribute to the greater good;
		  • Demand response programs are not well-known – people were often confused.
		• ThinkPlace recommended that energy providers diversify the types of feedback, including to indicate the collective impact, and fine-tune the reward system.



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