

AEMC 2016 RETAIL COMPETITION REVIEW:

NEW AND EMERGING ENERGY TECHNOLOGIES AND SERVICES

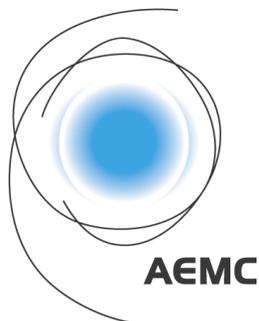
Consumer Research Report
June 2016



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RESEARCH

REPORT PREPARED FOR

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DISCLAIMER

In preparing this report we have presented and interpreted information that we believe to be relevant for completing the agreed task in a professional manner. It is important to understand that we have sought to ensure the accuracy of all the information incorporated into this report.

Where we have made assumptions as a part of interpreting the data in this report, we have sought to make those assumptions clear. Similarly, we have sought to make clear where we are expressing our professional opinion rather than reporting findings. Please ensure that you take these assumptions into account when using this report as the basis for any decision-making.

The qualitative research findings included throughout this report should not be considered statistically representative and cannot be extrapolated to the general population. For the quantitative research results, the base (number and type of respondents asked each question) and the actual survey questions are shown at the bottom of each page. Results may not always total 100% due to rounding. Weighted results are shown throughout the report, unless otherwise specified. The weighting approach is outlined in the methodology.

*This project was conducted in accordance with AS: ISO20252:2012 guidelines, to which Newgate Research is accredited.
Project reference number: NGR 1509005.*

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EXECUTIVE SUMMARY



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EXECUTIVE SUMMARY

This research was conducted as part of the Australian Energy Market Commission's 2016 annual review of retail competition in the National Energy Market (NEM). It focuses on the current and potential impacts of new and emerging technologies and services.

This study incorporated qualitative research with n=66 consumers from across the technology adoption spectrum, via six focus groups and a three-day online community forum. Results from the main quantitative survey with n=2,886 residents and small businesses are also included for context.

- ◆ Consumers who rated themselves as more likely to adopt new energy technologies and services tended to be male, younger, living in metropolitan areas, in households with higher incomes, and generally more comfortable taking risks.
 - ◇ They were also more likely to be more engaged in, satisfied with, and confident in their ability to navigate the energy market.
 - ◇ Indeed, these consumers are also the most likely to have already installed solar panels or storage batteries, or to be considering such technology in the next two years.

ENERGY MARKET ENGAGEMENT

- ◆ Overall, consumer sentiment towards energy matters is largely transactional and pragmatic, with key themes of cost, practicality and environmental concerns – and a sense of disempowerment. It is an everyday service still used without much understanding.
 - ◇ As in previous reviews, cost remains a key frustration. A frequent metaphor participants used to illustrate worries about the size of their energy bills and their inability to reduce them was an empty wallet or purse, while others spoke of wanting to "smash" and gain control of the costs.
 - ◇ There was also a strong undercurrent of concern for the environment, with participants pointing to best practice energy generation taking place overseas and feeling that Australia is lagging behind. They expressed an overall desire to take care of the planet and future generations.
- ◆ Cost and environmental concerns were therefore key lenses through which participants looked at major energy issues. However, knowledge of environmental issues was mixed, with many struggling to articulate specific concerns beyond the use of fossil fuels, greenhouse gases or "the climate".
 - ◇ There was optimism regarding the potential for Australia to shift further towards renewable energy. Indeed, many assumed that a good deal of innovation was already taking place in renewable energy generation, based on vague recollections of media coverage.
 - ◇ Conversely, there was also frustration at a perceived lack of industry support for the development of such innovation. Participants felt there was a lack of political and market will to address the impacts of the current system, pointing to negative experiences such as the reduction in solar rebates and stalling of large solar and wind farms.
- ◆ Consumers' relatively low levels of knowledge of the supply process, pricing structures and market regulation were matched with limited engagement with the energy market.
 - ◇ The vast majority of participants struggled to describe how electricity is distributed to their homes, while gas distribution was barely grasped. This remains something not many people ever think about.
 - ◇ Participants also struggled to name the components of energy costs or their relative impact on bills. Discussions of bills tended to focus on payment options such as discounts, rather than tariff types and options. Many also felt (or guessed) that there was ultimately little difference between the prices offered by the retailers.
 - ◇ There was no real awareness of who makes decisions on pricing other than a general impression that it was the government's remit.
- ◆ Engagement with retailers was generally limited to issues with billing and payment queries or discrepancies, meter readings, and investigations of other offers with a view to switching retailers.
 - ◇ A few participants mentioned energy tracking apps provided by their retailer, which had prompted them to become much more engaged and educated about their energy use, and to feel more in control.

EXECUTIVE SUMMARY *CONT'D*

KNOWLEDGE & PERCEPTIONS

- ◆ Symbolic analysis revealed participants' personal values surrounding new and emerging technologies, providing insights into barriers and drivers to future uptake.
 - ◇ The primary values revealed were a sense of environmental and intergenerational responsibility, coupled with a desire for imaginative problem-solving.
 - ◇ The secondary values were a mixture of desire for ambitious and courageous innovation, a fear and insecurity about Australia's willingness to do so, and a desire for empowerment.
- ◆ Solar power was seen as having the greatest and most immediate potential for increasing renewable energy generation and consumer control, with a particularly natural fit for Australia's climate.
 - ◇ Though awareness of recent developments in battery storage was very low, once consumers gained understanding of the technology, this generated quite a lot of excitement about its potential to boost solar (and wind) generation, bring costs down, potentially provide some income, and help with the resilience of the electricity grid.
 - ◇ Knowledge regarding other technologies was very limited, and the concept of new *services* was mostly off the radar. Electric cars, smart meters and time-of-use tariffs were broadly appealing to consumers. The benefits of remote controlled appliances however remained unclear, with retailer remote-control sparking privacy fears.

POTENTIAL UPTAKE

- ◆ There is a mix of internal and external barriers to wider adoption of new technologies and services, most notably a lack of knowledge and concerns regarding costs.
 - ◇ With limited knowledge, consumers found new opportunities in energy and their associated benefits difficult to grasp. Consequently, cost was a key barrier both in terms of actual and expected high costs. In turn, consumers were unable to make effective cost-benefit analyses. Most expected that prices would need to fall substantially before they could afford solar and other new technology options.

- ◇ Other issues related to limited knowledge included questions of reliability and a perceived lack of control, along with privacy concerns – especially regarding demand management services.
- ◆ Consequently, consumer fears regarding cost, reliability, control and privacy became elevated when assessing new technologies, often resulting in a "wait and see" inertia.
 - ◇ A related concern among renters and apartment dwellers was that they would not be able to physically install solar panels and storage batteries, largely due to physical space constraints, but also a lack of awareness of alternative options for harnessing solar power.
- ◆ There was a strong sense among research participants that more consumer education would lead to more uptake – ranging from building basic levels of understanding about energy market issues, challenges and developments, through to more specific advice and even coaching. When asked to research and explore new technologies that were already possible, participants were also generally excited and energised by their newfound knowledge.
 - ◇ Related to this was a desire for proof of the reliability of newer technologies to instil trust among consumers, particularly those who are fearful of losing control over their expenses and/or privacy.
- ◆ Participants struggled to visualise how the grid would adapt to the growth of renewable energy. However, many initially found the idea of leaving the grid very appealing and empowering – particularly those who experience regular network reliability issues or who have strong environmental values.
 - ◇ Those who were confident they would leave the grid in future felt they should not have to contribute to its future upkeep. An altruistic few displayed concern for the less well-off who are least able to afford the new technologies that would enable them to leave the grid, and who would consequently face rising grid-user costs. Most struggled to see a solution about how the grid should be paid for. Demonstrating their lack of knowledge, some thought the grid would 'shrink' with fewer people connected, so the costs to operate and maintain it should therefore be reduced accordingly.

EXECUTIVE SUMMARY *CONT'D*

- ◇ There was also a degree of concern about the reliability and capacity of new technologies to meet household needs, with the eventual consensus that leaving the grid entirely and facing the prospect of not having a "Plan B" was too great a risk. Thus most participants expected they would probably stay on the grid for the foreseeable future.

"What happens if the batteries malfunction? How long will it take to have them repaired or replaced? What happens in the meantime? I would hate to be off the grid and relying solely on solar and batteries."

FUTURE PREDICTIONS

- ◆ Looking ahead, participants found it easier to conceptualise the future of *product* technologies rather than energy-related *services*.
 - ◇ There was a general belief that little will have changed in five years' time, though solar and storage battery installations were expected to be starting to proliferate. Quite a few saw themselves as having a solar and storage system by then, while feeding excess energy back to the grid. Others dreamed of being able to afford this.
 - ◇ Home and demand management systems were viewed with some scepticism, due in part to an inability to grasp how they would provide genuine benefits.
 - ◇ There was an expectation that new technologies and services will have had profound impacts in 20 years' time, though participants struggled to articulate or envisage what this might entail. There was a strong expectation that the future of energy lies squarely in renewables, and potentially the proliferation of community energy networks and local generation.

"I think the vision of self-powered communities is nice, but a little rosy. I still think economies of scale will be hard to beat as energy generation technology improves... I think the British Gas video is a plausible vision of a middle class home in 10 years."

CONCLUSIONS & IMPLICATIONS

- ◆ New and emerging technologies are expected to have a continued and significant impact on the energy market, particularly over the next decade. This is likely to be driven in the immediate future by the rise of storage batteries, as there was a great deal of interest in these – especially once consumers better understood what they are and the associated potential benefits.
- ◆ However, the costs would need to come down substantially before most people consider them affordable. Many of the new technologies are currently considered big ticket items for the average household.
- ◆ Further, the dearth of knowledge and understanding is currently the greatest barrier to overcome before there is a substantial shift in the momentum around new technology uptake.
- ◆ This year's Review has shown that consumers still need some fundamental education about energy sector issues and challenges, and the role of market competition. This should be considered as part of a broader, sustained conversation that provides context for engagement on new and emerging technologies and services.
- ◆ In terms of *new* energy offerings, specific information and education is likely to build consumer confidence that such market offerings are reliable, efficient, environmentally beneficial, safe and affordable.
 - ◇ The research suggests that the independent comparison websites could be enhanced to provide some of this education.
 - ◇ More concerted efforts would be needed to specifically educate consumers about new energy *services* (as distinct from technologies) because they struggle to grasp what such services could be, let alone the relevance of these seemingly less tangible offerings.



INTRODUCTION



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OBJECTIVES

UNDERSTANDING THE IMPACT OF EMERGING TECHNOLOGIES ON THE RETAIL ENERGY MARKET

Newgate Research was commissioned by the Australian Energy Market Commission (AEMC) to undertake consumer research to inform the AEMC's 2016 annual review of retail competition in the National Energy Market (NEM) – comprising Queensland, New South Wales, the ACT, Victoria, Tasmania and South Australia.

The research sought to measure and monitor the level of knowledge and engagement with the energy market among residential and small business consumers, building on previous waves conducted by Newgate Research for the 2014 and 2015 reviews. The 2016 research included a quantitative survey and the introduction of new qualitative modules focusing on vulnerable customers and new and emerging technologies.

This supplementary report focuses on the findings from the new and emerging technologies research, combining primarily qualitative insights with supporting evidence from the quantitative survey where relevant to highlight the current and potential impact of such technologies and services on the retail energy markets in the NEM.

The key objectives were to explore and understand:

- Awareness and understanding of new and emerging technologies and services in the energy market – with a particular focus on electricity;
- Current and potential uptake, including associated drivers and barriers; and
- Expectations around associated consumer protections.

NOTES TO THE READER

This research was conducted in accordance with the international quality standard for market and social research (ISO 20252).

In preparing this report we have presented and interpreted information from both the research that we believe to be relevant to achieve the objectives of this research project.

Where assumptions are made as a part of interpreting the results or where our professional opinion is expressed rather than merely describing the findings, this is noted. Please ensure that you take these assumptions into account when using this report as the basis for any decision-making.

The quantitative research methodology – including the weights used, the respondent base and the questionnaire – is provided in the companion report, *Consumer Research for 2016 Nationwide Review of Competition in Retail Energy Markets*.

Where quantitative results are shown, percentages on single response questions may not total 100% due to rounding, or if the question was multiple response the total may also exceed 100%. Results from the main quantitative survey are weighted.

Qualitative findings included throughout this report should not be considered statistically representative and cannot be extrapolated to the general population.

Verbatim quotes from the research are included in the report to further support and provide evidence of the findings.

Please note: The residential incidence of solar panel installations at 24% for the NEM (including Tasmania and rest of Queensland) does not align with the national penetration of solar PV installations reported by the Clean Energy Regulator (CER), which we understand was at 16% at the time of the survey (December 2015). Not only are the geographic areas different, we also understand there is some lag in the CER's results. Further, Newgate's result may be influenced by survey participants including solar hot water and solar appliances (e.g. garden lights), as well as systems that are pending registration or have been failed by the CER.

METHODOLOGY

- ◆ **A mixed-method qualitative approach of focus groups and online communities was used**, targeting a combination of residential and small business consumers from across the NEM. The study further targeted consumers from across the technology adoption spectrum based on Everett Rogers' diffusion of innovations theory. **In total, 66 people participated in this research**, as tabled to the right.
- ◆ **Focus groups:** Six focus groups were conducted by Newgate Research in the evenings of 15-17 March 2016. Two groups each were conducted in Sydney, Melbourne and Gympie, with one group of earlier adopters (Early Adopters / Early Majority) and another group of later adopters (Late Majority / Laggards) in each location. In line with accepted market research practices, residential participants received an \$100 incentive each for their time, and small business participants received \$150 each. One or more representatives from the AEMC and other government organisations observed each session.
- ◆ **Online community:** An online forum was held with a mix of 20 consumers from across the NEM. It ran for three days from 7-9 March 2016, with free-time forums on the first two days and a 'live chat' discussion from 7:30-8:30pm AEDT on the final day. The community was facilitated by Newgate Research and, in line with market research practices, all participants received a baseline incentive of \$80 each plus \$40 for attending the final session, and there were opportunities for bonus participation incentives. AEMC representatives were able to login and observe the forum.
- ◆ Recruitment was undertaken by J&S Research Services using detailed recruitment scripts and screening questionnaires prepared by Newgate Research. A copy of the discussion guides used in the research can be found in the Appendices.

| NUMBER OF FOCUS GROUP PARTICIPANTS | EARLIER ADOPTION (3 Groups) | LATER ADOPTION (3 Groups) | TOTAL PARTICIPANTS |
|--------------------------------------|-----------------------------|---------------------------|--------------------|
| SYDNEY (2 Focus Groups) | 8 | 8 | 16 |
| Residential | 6 | 6 | 12 |
| Small Business | 2 | 2 | 4 |
| MELBOURNE (2 Focus Groups) | 6 | 7 | 13 |
| Residential | 5 | 5 | 10 |
| Small Business | 1 | 2 | 3 |
| GYMPIE (2 Focus Groups) | 8 | 7 | 15 |
| Residential | 6 | 6 | 12 |
| Small Business | 2 | 1 | 3 |
| TOTAL | 22 | 22 | 44 |

| 3-DAY ONLINE COMMUNITY | RESIDENTIAL | SMALL BUSINESS | TOTAL PARTICIPANTS |
|------------------------|-------------|----------------|--------------------|
| Innovators | 1 | 1 | 3 |
| Early Adopters | 4 | 2 | 6 |
| Early Majority | 6 | - | 6 |
| Late Majority | 6 | - | 6 |
| Laggards | - | - | - |
| TOTAL | 17 | 3 | 20 |

- ◆ Some of the results from the quantitative survey are provided at the start of this report for context. In summary, the target audience was a combination of residential and small business consumers across the NEM. The sample size of this mixed-method quantitative study was n=2,333 residential consumers and n=553 small businesses. Please see the main report for the full method.

RESEARCH FINDINGS



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TECHNOLOGY ADOPTION SPECTRUM – QUANTITATIVE SURVEY RESULTS



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TECHNOLOGY ADOPTION SEGMENTS

The following results are taken from the quantitative study detailed in *Consumer Research for 2016 Nationwide Review of Competition in Retail Energy Markets*.

All small business participants and *online* residential participants, as well as a small portion of telephone-interviewed residential participants (i.e. during piloting), were asked to self-rate their attitudes towards new technologies using statements that reflected Everett Rogers' diffusion of innovations theory, commonly known as the technology adoption curve. The specific question and segment definitions are shown over the page.

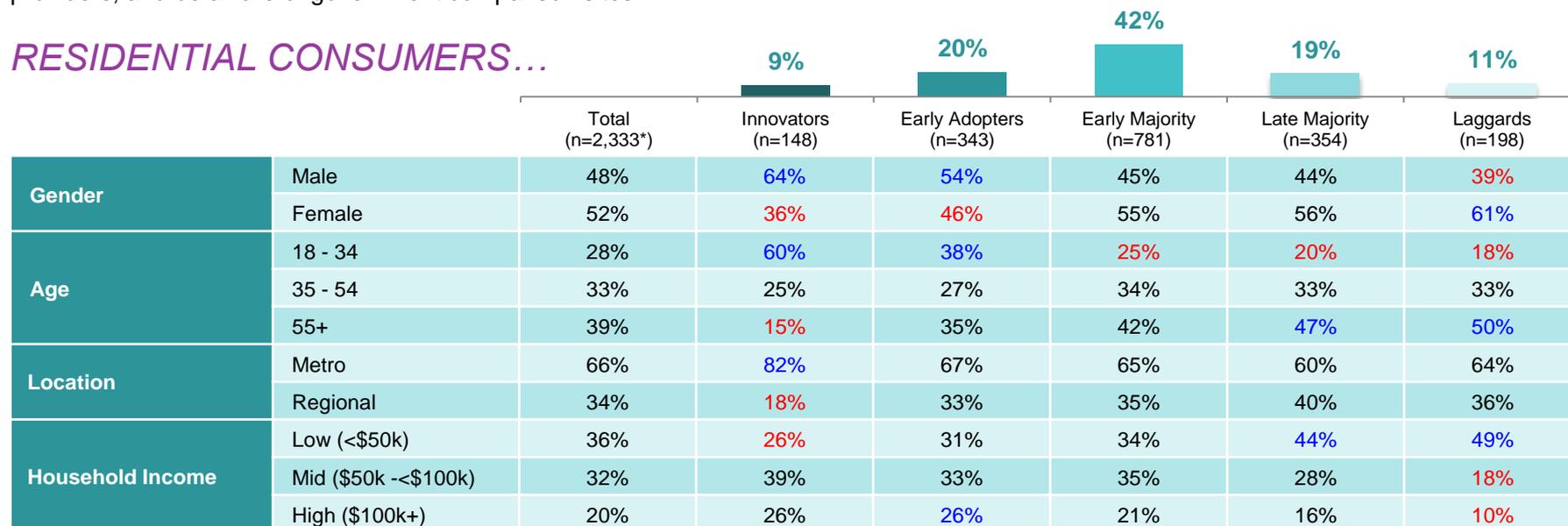
Among residential consumers, those who indicated they were more likely to adopt newer technologies were: male, younger, living in metropolitan areas, in households with higher incomes, and generally more comfortable taking risks. They were also more likely to have recently investigated their energy options, be interested in switching providers, and be aware of government comparison sites.

'Innovators' in particular were more likely to be satisfied with their energy provider and the current level of market choice, and to be highly confident in their ability to find the right information and choose the right plan. Self-described 'Early Adopters', meanwhile, were more likely than all other consumers to have recently switched provider or plan.

Unsurprisingly, earlier adopters were more likely to be considering solar panels or battery storage in the next two years, and were indeed more likely to already have solar panels. Innovators in particular were more likely than others to already have storage batteries installed.

Note that these are self-reported likely behaviours, and that such claims may not reflect actual behaviours – i.e. consumers may be more (or indeed less) confident in their actual capacity or willingness to adopt new technology than may eventuate in reality.

RESIDENTIAL CONSUMERS...



KEY RESULTS *CONT'D*

RESIDENTIAL CONSUMERS

| | | | 9% | 20% | 42% | 19% | 11% |
|---|---------------------------------------|----------------------------------|-----------------------|---------------------------|---------------------------|--------------------------|---------------------|
| | | Total (n=2,333 [^]) | Innovators (n=148) | Early Adopters (n=343) | Early Majority (n=781) | Late Majority (n=354) | Laggards (n=198) |
| Investigated Options | In past 12 months | 30% | 42% | 39% | 30% | 23% | 17% |
| | Switched Energy Provider or Plan | | | | | | |
| Switched Energy Provider or Plan | In past 12 months | 26% | 24% | 30% | 24% | 22% | 15% |
| | In past 5 years | 45% | 38% | 51% | 46% | 42% | 30% |
| Aware of Gov't Comparison Sites | Nett <u>prompted</u> recall | 16% | 41% | 21% | 10% | 8% | 5% |
| Satisfaction (Nett satisfied) | Electricity provider | 72% | 86% | 71% | 69% | 72% | 69% |
| | Gas provider | 72% | 88% | 71% | 66% | 71% | 80% |
| | Market choice | 60% | 79% | 66% | 58% | 55% | 50% |
| Current Interest in Switching | Interested / looking | 46% | 63% | 59% | 48% | 38% | 17% |
| | Not interested at all | 3% | 13% | 17% | 30% | 38% | 60% |
| High Confidence In... (Nett 7-10 out of 10) | Finding the right info | 62% | 79% | 67% | 63% | 59% | 52% |
| | Choosing the right plan | 61% | 77% | 68% | 59% | 56% | 52% |
| New / Emerging Technologies | Has solar panels[#] | 24% | 36% | 33% | 21% | 20% | 16% |
| | Definitely will install ^{**} | 2% | 6% | 2% | 2% | 1% | 1% |
| | Probably will install ^{**} | 8% | 21% | 14% | 9% | 5% | 2% |
| | Nett likely to install ^{**} | 10% | 28% | 16% | 10% | 6% | 3% |
| | Has storage batteries | 2% | 10% | 1% | 1% | 1% | 3% |
| | Definitely will install ^{**} | 6% | 29% | 11% | 4% | 2% | 0% |
| | Probably will install ^{**} | 10% | 19% | 17% | 10% | 6% | 1% |
| Nett likely to install ^{**} | 16% | 48% | 27% | 14% | 8% | 1% | |
| Willingness to Take Risks | Nett 8-10 out of 10 | 22% | 59% | 38% | 16% | 10% | 10% |

D23. If an energy company offered a new technology or innovative service **BUSINESS SURVEY ONLY: for businesses**, which of the following would best describe you? Would you... [Definitions shown in brackets – not shown to survey participants.] 1. Be one of the very first to know about and try it [Innovators] / 2. Use it before most other [people / businesses] [Early Adopters] / 3. Wait until others you know have used it before you do [Early Majority] / 4. Wait until most other [people / businesses] have used it before you do [Late Majority], or / 5. Would you probably not be interested, and only use it if you really had to [Laggards]?

NB: Colour codes have been applied where a segment is significantly different from the average result among all other respondents:

blue denotes a proportion that is significantly **higher** than the average, while **red** denotes a result that is significantly **lower** than the average.

[^]The 'Total' shows the profile and results among ALL survey respondents, while the adoption spectrum results are just among those asked the question.

^{**} In the next 2 years. "Nett likely" includes "definitely will" and "probably will".

[#]Please see the note on solar PV incidence under Notes to Reader on page 9.

KEY RESULTS *CONT'D*

SMALL BUSINESS CONSUMERS

| | | Total (n=553) | Innovators (n=35*) | Early Adopters (n=87) | Early Majority (n=275) | Late Majority (n=108) | Laggards (n=48*) |
|-----------------|---|------------------|-----------------------|--------------------------|---------------------------|--------------------------|---------------------|
| Location | Metro | 66% | 70% | 67% | 64% | 68% | 71% |
| | Regional | 34% | 30% | 33% | 36% | 32% | 29% |
| Industry Sector | Professional, Scientific and Technical Services | 19% | 16% | 23% | 18% | 16% | 22% |
| | Construction | 9% | 8% | 10% | 9% | 12% | 6% |
| | Administrative and Support Services | 8% | 4% | 7% | 10% | 7% | 7% |
| | Retail Trade | 8% | 12% | 2% | 10% | 7% | 5% |
| | Health Care and Social Assistance | 7% | 12% | 6% | 6% | 8% | 12% |
| | Agriculture, Forestry and Fishing | 7% | 4% | 3% | 8% | 6% | 6% |
| | Financial and Insurance Services | 6% | 0% | 9% | 8% | 3% | 6% |
| | Wholesale Trade | 6% | 8% | 2% | 8% | 6% | 5% |
| | Manufacturing | 5% | 3% | 2% | 5% | 8% | 6% |
| | Transport, Postal and Warehousing | 5% | 8% | 4% | 3% | 10% | 5% |
| | Rental, Hiring and Real Estate Services | 5% | 9% | 9% | 3% | 6% | 1% |
| | Accommodation and Food Services | 5% | 9% | 12% | 3% | 3% | 3% |

KEY RESULTS CONT'D

SMALL BUSINESS CONSUMERS

| | | | 5% | 17% | 50% | 20% | 8% |
|---|------------------------------|--------------------------------|------------------------------------|--------------------------|---------------------------|--------------------------|----------------------------------|
| | | Total (n=553 [^]) | Innovators (n=35 [*]) | Early Adopters (n=87) | Early Majority (n=275) | Late Majority (n=108) | Laggards (n=48 [*]) |
| Investigated Options | In past 12 months | 32% | 47% | 33% | 31% | 40% | 13% |
| | In past 5 years | 44% | 47% | 45% | 43% | 47% | 36% |
| Switched Energy Provider or Plan | In past 12 months | 19% | 15% | 16% | 19% | 23% | 14% |
| | In past 5 years | 44% | 47% | 45% | 43% | 47% | 36% |
| Aware of Gov't Comparison Sites | Nett <u>prompted</u> recall | 15% | 22% | 18% | 14% | 17% | 7% |
| | | | | | | | |
| Satisfaction (Nett satisfied) | Electricity provider | 67% | 70% | 68% | 60% | 80% | 78% |
| | Gas provider | 67% | 71% | 77% | 55% | 87% | 100% |
| | Market choice | 61% | 58% | 63% | 57% | 67% | 67% |
| Current Interest in Switching | Interested / looking | 48% | 58% | 57% | 53% | 35% | 20% |
| | Not interested at all | 34% | 18% | 30% | 30% | 44% | 57% |
| High Confidence In... (Nett 7-10 out of 10) | Finding the right info | 64% | 70% | 69% | 60% | 67% | 71% |
| | Choosing the right plan | 63% | 54% | 64% | 56% | 74% | 80% |
| New / Emerging Technologies | Has solar panels | 22% | 28% | 33% | 21% | 15% | 11% |
| | Definitely will install** | 3% | 12% | 7% | 1% | 3% | 0% |
| | Probably will install** | 7% | 12% | 16% | 6% | 5% | 0% |
| | Nett likely to install** | 10% | 24% | 23% | 6% | 8% | 0% |
| | Has storage batteries | 3% | 10% | 1% | 1% | 5% | 3% |
| | Definitely will install** | 6% | 17% | 14% | 3% | 3% | 0% |
| | Probably will install** | 10% | 15% | 29% | 6% | 5% | 0% |
| Nett likely to install** | 15% | 32% | 44% | 9% | 9% | 0% | |
| Willingness to Take Risks | Nett 8-10 out of 10 | 21% | 56% | 33% | 18% | 9% | 12% |

NB: Colour codes have been applied where a segment is significantly different from the average result among all other respondents: **blue** denotes a proportion that is significantly higher than the average, while **red** denotes a result that is significantly lower than the average.

^{*} Caution: Small sample size.

[^]The 'Total' shows the profile and results among ALL survey respondents, while the adoption spectrum results are just among those asked the question.

^{**} In the next 2 years. NETT Likely includes "definitely will" and "probably will".

CURRENT MARKET ENGAGEMENT

*The remainder of this report
focuses on the qualitative
research findings*



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ABOUT THIS SECTION

To provide context for how consumers might interact with new and emerging technologies in the future, we needed to understand their existing knowledge, how they were engaging and their levels of interest in the energy sector.

- ◆ We examined this through discussions on a number of topics, including:
 - ◇ General feelings, interests and relationships with energy;
 - ◇ Views on the big issues facing the sector at the moment;
 - ◇ Understanding and sentiment about the way electricity and gas are delivered to homes and businesses;
 - ◇ Current understanding and interactions with the market (i.e. levels of contact with retailers, reasons for contact, switching behaviours);
 - ◇ Understanding of the delivery process (i.e. the stages from generation to transmission, distribution and retail);
 - ◇ Comprehension of the components of electricity bills; and
 - ◇ Understanding of who makes the decisions on energy pricing and the options available for charging for energy.
- ◆ To deepen our insight, we also asked participants to complete some 'homework' by bringing along an item that represented their current relationship with energy.
- ◆ A detailed analysis of their responses follows.



RELATIONSHIP WITH ENERGY

SENTIMENT TOWARDS ENERGY IS LARGELY TRANSACTIONAL AND PRAGMATIC, BUT THERE ARE STRONG COST AND UNDERLYING ENVIRONMENTAL CONCERNS

- ◆ Three key themes emerged in participants' current feelings and relationships with energy and associated matters – cost, practicality and the environment, as illustrated here with examples of the items they brought along and provided in the discussions. Adding to the frustration is that even though they use energy every day, consumers still had a limited understanding of the linkages between their usage and the costs. This was coupled with a sense there is little they can do about it.

Cost



An empty purse: Related to perceived high costs and recent significant increases.



A hammer: To smash energy prices.



Electrical timers: Giving you control over your costs.

Practicality



A Leatherman tool: Very useful and practical, something you use every day.



A toothbrush: You use it every day. Also represents clean energy.



Smart phones: A part of everyday life and something you can't live without.

The Environment



The globe in hand: The future of the planet is in our hands.



A European home covered in solar panels: Europe is leading the way and taking every opportunity to generate clean energy. Australia is lagging and lacking political will.



A solar powered desk lamp: Reflecting a dual desire to be more self-sufficient while also benefiting the environment.

PERCEPTIONS OF MAJOR ENERGY ISSUES

COST AND GENERATION ENVIRONMENTAL IMPACTS SEEN AS THE MAIN ISSUES: RENEWABLES AND INNOVATION CREATE HOPE, DESPITE PROGRESS FRUSTRATIONS

- ◆ When describing the big issues and challenges facing the energy sector, participants focused in roughly equal proportions on the financial and environmental costs associated with energy generation and delivery. Knowledge and engagement levels were mixed, though many struggled to articulate specific environmental concerns beyond the use of fossil fuels, greenhouse gases or 'the climate', and generally wanting clean, healthy and sustainable forms of generation.
- ◆ They were very positive about the potential for Australia to achieve reliable and sustainable energy supplies through renewable sources – particularly solar energy. They expected that in the longer-term much more energy would come from renewable sources, especially as production costs and prices come down.
- ◆ Many participants essentially assumed there is a good deal of innovation happening in harnessing solar, wind, hydro and wave power, with some recalling hearing about innovations in the media. A fair few could recall most recently hearing about storage batteries. However, very few could remember much detail. Those who knew more about batteries (mainly solar users) could see themselves using them in future, provided they are affordable, clean, reliable and safe.
- ◆ However, mixed with this sense of hope was an equal level of concern at what they saw as a lack of industry support for the expansion of these technologies. Most notably, significant reductions in solar rebates were commonly offered as an example of energy providers and/or the government hampering the uptake of the technology. Many people who had looked into solar were aware that, initially, rebates of 40 to 50 cents per kWh or more were available, but that this had since reduced to less than 10 cents.
- ◆ As a result, there was a strong vein of frustration and cynicism at what was described as a lack of political and industry will to address the financial costs and environmental impacts of the current energy system. This is clear in some of the quotes here and over the page.

"I think all these lobbying groups are going to enforce a lot more greener energy use, which will undoubtedly come at a price reflected on bills to consumers."

"I think we will all be self-generating in 50 years."

"Government selling off assets, privatising."

"I think it is great that solar is becoming more widespread and battery technology is getting better. Maybe we can eventually stop using fossil fuels one day."

"I think that there are questions regarding how we get our energy in the future and whose responsibility it is. Consumers are mostly concerned about costs. The government should be concerned with the longer-term big picture but I don't feel like this is true."

"From what you read in the papers, it's about companies gorging in profits. They're unregulated and they can charge what they want."

"Affordability. Cost of electricity exceeding normal CPI increases. Families going without basics to pay electricity."

"How long can we do coal-fired power stations in this country?"

"Fossil fuels are a band-aid solution that are harming our environment. As a consumer, I am willing to pay more (within reason) for a green option."

"Ironically, we could have cheap, abundant nuclear energy, but years of anti-nuclear propaganda will prevent significant change."

EXAMPLE SENTIMENT FROM MORE ENGAGED CONSUMERS (ONLINE FORUM)

"My partner and I often discuss our power and gas bill - we have a goal to see how far under the average we can keep it in terms of usage. The government is generally portrayed in the media to be overly supportive of the fossil fuel industry and its importance. Our economy doesn't count for much if the trade off is our planet. We do a lot to minimise usage - open windows instead of using fan/aircon, we make a conscious decision not to have a clothes dryer, turning lights off when not in use, don't leave fridge door open. All basic things that aren't hard to do. I have lived with others in the past who take these things for granted - most of the time it's about developing habits and then you won't even think about it any more."

"I think it is great that solar power is becoming more widespread and battery technology is getting better. I am excited that as the costs come down and these systems become more common we won't have to use fossil fuels as much and maybe we can eventually stop one day. I think this will mean that energy companies will have to get on board with these new technologies or they will be in big trouble. Just like Kodak and the rise of digital cameras. I would be very disappointed if this shift from old energy to new energy disadvantages people who cannot afford to switch to new energy - e.g. if energy companies raise their prices for old energy users to offset any lost revenue from new energy. Energy companies should be positioning themselves to take advantage of the new technologies so that as we transition to newer energy sources no section of the community is unfairly disadvantaged."

"The main issue in energy is moving into sustainable energy. Currently there are not enough sustainable sources of energy resources being utilised and instead we are getting our energy from traditional sources such as coal, oil and gas. This may be easier and cheaper at the moment but we need to making larger steps toward sustainable energy while we still have the time and resources to set up the infrastructure and industry...My interpretation of sustainable energy is the energy was obtained from sources which cannot be depleted or exhausted. Also the production does not change the composition of our atmosphere, such as carbon from fossil fuels which has been underground or in rocks for millions of years being released into the atmosphere. Examples of sustainable energy is solar, wind, etc."

"I think that there are questions regarding how we get our energy in the future and who's responsibility it is. Consumers I think are mostly concerned about costs and keeping them stable, not too high but not too low. The government should be concerned with the longer term, big picture but I don't feel like this is true. Often, these days, a government isn't in for very long and therefore only cares about the quick fix, what will impress the most people the quickest. The industry would be dealing with multiple issues and I would think be the most aware of what's going on. They would need to balance the cost verses making a profit. With my friends, we mostly talk about costs and how to keep them low (restricting use, new devices or gardens that help and so on). most of the info I see is through social media. I have a number of friends who are concerned with climate change and share articles and info regularly. I also have friends who live in the mid north and the closure of the Port Augusta Power plant has begun to come up in conversation more, I help at a homework club for refugees and recently there has been a lot about energy and climate change. I've been learning with the students about different forms of alternative energies and that the current government have very little info available about their policy on climate change and energy resources."

"The big issues and challenges are about affordability. Cost of electricity exceeding normal CPI increases. Families going without basics to pay electricity. I definitely have gone without in terms of leisure activities in order to pay electricity bills. Others I know of cannot afford for their children to do extra curricula activities and attend school excursions due to rising energy costs. Education, including the ability to fully experience all elements of school is a basic need."

KNOWLEDGE OF THE ENERGY MARKET, STRUCTURE & COSTS

LOW ENGAGEMENT EVIDENT IN LIMITED KNOWLEDGE OF ENERGY SUPPLY PROCESSES, PRICING STRUCTURES AND REGULATION

- ◆ Overall, the research participants demonstrated very low knowledge of the energy market, its structure and how pricing works, including bill components and how pricing is regulated.
 - ◇ The vast majority of participants struggled to describe how electricity is distributed to their homes. Most understood that the power is generated and distributed along wires, but there was very little unprompted knowledge of the actual transmission and distribution structure or the differences between them.
 - ◇ Gas distribution was barely grasped and never thought about. While many participants knew that gas pipes run underground, none could really describe the gas supply structure or process.
 - ◇ There was some variation in understanding of the role of retailers, with some believing they merely read meters, send bills and collect money. Some people were aware that issues with connections were referred to another company e.g. one gas customer mentioned being referred to their distribution company.
- ◆ Further revealing low knowledge levels, participants were broadly unable to name the components of energy costs or the relative proportions they represent on their bills. The majority had a sense that retailers probably have the lowest costs, therefore likely represent a smaller percentage. A few, however, suspected the retailers were taking the lion's share.
- ◆ Awareness of bill components was limited, beyond there being supply and usage charges, and peak versus off-peak rates. With charging options, participants tended to mention payment options rather than tariff types and options (e.g. discount rates, bundling discounts, concessions for pensioners, billing periods). Solar users were, however, very aware of their rebate and plan type.
- ◆ There was no real awareness of who makes the decisions on pricing other than a general perception that this is regulated by government. There was a little bit of debate (but not concern) about whether this was a state or federal responsibility.

COST COMPONENTS...

"Retailers get the smallest amount."

"Retailers probably get 80%."

"All that the retailers are doing is a brokering job – they're just buying it and selling it on to us."

"I think you pay more for distribution than for generating the electricity. Maybe 60%."

"Those big tower things would be expensive to run and maintain."

"I would have thought generators would be the biggest proportion."

"I think they charge service delivery per day. I don't know much about why they charge this. I think it's the same for gas as well. I don't recall what it actually says on the bill."

"For gas, there's an amount for supply, for usage, and a connection fee. Over time the connection fee has increased."

"The bill breaks it down into how much the rental of it is and I know this is how much you get charged for these kilowatt hours, but what does that mean to us?"

THE SUPPLY SYSTEM...

"They dig up the coal, it goes from a power station to a substation, then underground to get it up to the house. Other than that, [the process is] all fairies and unicorns."

"It's not really something I think about."

"I know gas goes under the ground..."

PRICING DECISIONS...

"It has to be regulated because someone would just come in and undercut everyone."

"Is there a government body? A lobby that sets the price?"

"Probably some state government body."

"They're not allowed to collude with each other, but how come they are all around the same price? Who sets the base minimum?"

"The Victorian Government take their own decisions."

CURRENT MARKET ENGAGEMENT

ENERGY IS 'JUST SOMETHING THAT'S THERE'; LITTLE ENGAGEMENT BEYOND INVESTIGATING OTHER OFFERS

- ◆ Limited knowledge levels were matched with limited engagement. Many participants described energy as something they expect to be available when they flick a switch, and then they pay the bill.
 - ◇ Despite concerns about the impacts of generation, they were quite neutral about the way electricity and gas are delivered, not least because this is largely invisible to them. As such they had a lack of emotional involvement with this aspect of supply, except in situations involving emergencies and blackouts.
- ◆ Beyond this, individuals' engagement with the market was broadly limited to contact with the retailers over billing or payment queries or discrepancies, issues with meter readings, and/or investigations of other offers with a view to switching retailers.
- ◆ Around half had investigated switching at some point. Of these, around half again had changed retailers and were satisfied with the decision to switch, believing they had sourced a better deal.
 - ◇ Those who had not investigated switching were either not motivated to change because of a belief they were on an acceptable deal, or were under the impression that switching would be difficult and had not attempted to change.
 - ◇ Among those who investigated other retail offers but did not switch, reasons for not doing so included the difficulty of comparing like with like, or little perceived difference in prices once offers were eventually compared.
 - ◇ Some participants could not investigate other offers as no other provider was available in their region. This was mentioned by some Gympie and Sydney participants.
- ◆ A few participants had apps provided by their retailer that enabled them to monitor their usage and costs. They explained that this had prompted them to become much more engaged and educated about their energy use, sparking interest among others.

GENERAL ATTITUDES TO ENERGY ...

- "Energy is like food and communication - they are essentials."*
- "It's a necessity, you can't live without it."*
- "I try to stay informed, but I'm not looking into it regularly."*
- "We're renters, so I'm only vaguely following what is available."*
- "I've got other things to think about in life."*
- "I think the public conversation around energy has died a bit because people don't believe anything is going to change."*

COMPARING OFFERS...

- "I tried to compare, but it was too tricky for me. You're just not comparing apples to apples."*
- "I looked at changing because of the prices I was being charged, and I put it all into a spreadsheet so I could compare costs, but in the end, the costs were no different, so I stayed."*
- "Each area of Sydney we moved to had a different provider. I wanted to move mine with me and I couldn't."*
- "I joined [retailer] because of the app – one of my friends told me about it. I can keep an eye on what I'm using on a daily basis, and you can just add credit whenever you need it."*

BILLING & METERING...

- "How can this industry be allowed to act the way it is? We spent four months going into bad debt and bad credit because we were paying for a meter reading for the restaurant downstairs!"*
- "We receive updates from our provider that allow you to see your daily use. All this information makes us monitor our use more as we can see the changes in our use. Previously we just got a bill each quarter and we were not engaged at all...My kids can also see our energy use go up and down and so they switch off lights and computers etc when they are not using them."*

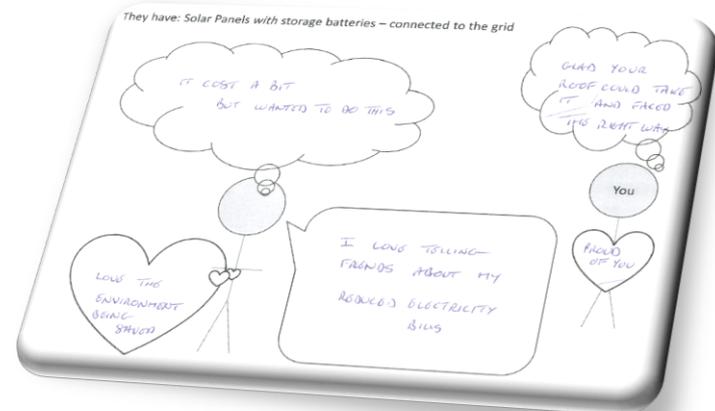
KNOWLEDGE AND PERCEPTIONS



NEWGATE
RESEARCH

ABOUT THIS SECTION

- ◆ The analysis in this section synthesises the results of a number of tasks and exercises aimed at teasing out reactions to specific new offerings in the energy space. These included:
 - ◇ A symbolic analysis exercise where participants were asked to select an image which best reflected their current thoughts and feelings related to new and emerging electricity technologies and services. A metaphoric analysis was then conducted to understand the personal values which influence these thoughts and feelings (using social psychologist Milton Rokeach's values inventory).
 - ◇ Discussions of participants' current knowledge (unprompted), including perceptions on their potential market impact
 - ◇ A 'Think, Say, Feel' exercise (illustrated on this page), where participants were given worksheets with one of four new technologies. They were asked to imagine and write down what a person who had that technology would be thinking, saying or feeling about it, as well as what they would personally be thinking and feel about that person. Other examples of these completed worksheets are provided in Appendix 1.
 - ◇ Review of a worksheet listing 11 new energy technologies and services (including those used in the 'Think, Say, Feel' exercise), where participants individually rated their likelihood to purchase that technology, on a scale of 0 to 10, and provide reasons why/why not.
 - ◇ An infographic explaining the energy network structure and the new and emerging products and services which are becoming available.
- ◆ The technologies and services tested in the Think, Say, Feel and other exercises were:
 - ◇ Solar panels – grid connected;
 - ◇ Solar panels – not grid connected;
 - ◇ Storage batteries – grid connected;
 - ◇ Storage batteries – not grid connected;
 - ◇ An electric car;
 - ◇ A smart/interval/digital meter;
 - ◇ An energy management system (controls heating and cooling);
 - ◇ Appliances that can be remotely controlled;
 - ◇ An app that allows remote control of appliances;
 - ◇ Allowing energy companies to remotely adjust appliances;
 - ◇ Solar Power Purchase Agreements; and
 - ◇ Going on 'time of use' tariffs (peak, off-peak and shoulder rates).



VALUES AROUND NEW AND EMERGING TECHNOLOGIES

PRIMARY VALUES: RESPONSIBILITY TO THE ENVIRONMENT AND FUTURE GENERATIONS, AND USING INTELLECT AND IMAGINATION TO FIND SOLUTIONS

This analysis identifies the core personal values that are currently influencing consumers' reactions to, and interactions with, new and emerging electricity technologies and services, based on an exercise where participants were asked to choose an image or two from a set of metaphoric images that reflected how they feel about these generally, and if they had any particular concerns. Note that the core values identified are based on social psychologist Milton Rokeach's values inventory, and are either 'terminal' values that relate to preferred end states or goals a person might want to achieve; or 'instrumental' values that relate to preferable modes of behaviour (which are usually linked to achieving those goals). Italics indicate the descriptors used by Rokeach.



Forest with Path

"I went with the forest because it means more green energy."

"The forest. It's something that is endangered. You would want to retain the beauty of the forest."

"If we don't switch to this sort of energy, then places like that could be cut down, or could be saved if we do."



Cherub or Angel

"He's thinking: How can this benefit me and the people I live with?"

"Being open to anything – being open to change."

"Thinking, wondering what it's all about, not knowing much, but interested."

- ◆ **Symbolism:** The forest naturally represents the environment, while the path is about direction and included feelings of being lost, helpless, in the wilderness.
- ◆ **Interpretation:** This image represents participants' fears of not having a clear direction for protecting the environment and their desire to see someone taking responsibility to develop one. Many also chose a sunflower to represent hope.
- ◆ **Associated values:** Taking *responsibility* (behaviour), *self-respect*, a *world of beauty* and an element of *national or even global security* (in terms of securing the planet's future). These are all goals-related values.
- ◆ **Implications for technology uptake:** Environmental protection is expected to be at the core of new energy technologies and services, but also requires an element that allows people to feel they are taking responsibility and helping to take the planet in the right direction.

- ◆ **Symbolism:** Some participants saw this as a guiding angel, while others saw it as a child who is open to being guided and taught new ideas. It was also thought to represent future generations.
- ◆ **Interpretation:** The idea of guidance being given and taken suggests an exchange of ideas, and a desire to be heard. The child represents innocence, naivety (or lack of knowledge) and great potential; as well as family and the people we love.
- ◆ **Associated values:** Behavioural values of displaying *love* for their families and their futures, plus using *intellect* and *imagination* to develop solutions. End goals of *family security*, *national security*, and achieving a *world of beauty* also apply.
- ◆ **Implications for technology uptake:** Consumers want to understand the benefits of the technologies being developed. They also want their needs to be heard, not just to solve individual needs, but also to protect their families' futures.

VALUES AROUND NEW AND EMERGING TECHNOLOGIES CONT'D

SECONDARY VALUES: AMBITION, INTELLECT AND COURAGE IN IDEAS CREATE A STRONG SENSE OF HOPE, BUT THERE IS ALSO FEAR OF A LACK OF CAPABILITY



Sonic Boom

"Technology, leaping ahead."

"Hoping there are new and better ways of harnessing energy and charging for it."

"Breaking through with new ideas."

"The way forward, modern."

- ◆ **Symbolism:** Participants saw this as breaking through a cloud or barrier and moving forward. The plane represents modernity and what man is capable of.
- ◆ **Interpretation:** This image reflects the 'halo' that participants tended to place around the idea of new technologies, based on a belief they will make things better or easier. It is positive and displays confidence and excitement in innovation.
- ◆ **Associated values:** To achieve such breakthroughs would require behaviours such as being *ambitious*, using *intellect*, *leadership* and *imagination* and having *courage* in ideas. This speaks to end goals of a *sense of accomplishment*, *self-respect* and potentially an element of *social recognition* for what has been achieved.
- ◆ **Implications for technology uptake:** Participants have hope that new electricity technologies and services will be the result of strong leadership that propels leaps in innovation, as well as looking at problems differently and creating smart new solutions. This could open opportunities to not only inspire – but reward – more engagement in the sector. Linked with the concerns below, this includes engagement at the grass-roots consumer level to improve empowerment.



Person Caught in Net

"The net: we get caught in arguments for and against solar and nuclear and wind...it's hard to know who's right."

"I feel trapped by electricity companies. I don't like them at all."

"I feel disempowered, not in control."

"Trapped: we only have so many options. The companies are all seem pretty much the same to me."

- ◆ **Symbolism:** Participants saw the net as representing the retailers themselves (trapping people into their plans), and the feeling of being unable to do anything about it or take charge because of a lack of knowledge about energy and the options that might be available. At a more subtle level it also represented the sector being caught up in fighting over the right technologies.
- ◆ **Interpretation:** The image is about personal confusion and disempowerment, as well as frustration at a sector that is perceived to be hampering consumers and not providing the required guidance and leadership on the best way forward.
- ◆ **Associated values:** Behaviourally, participants are looking for the *capability* to make choices via *more information*, *empowerment* to act through access to new choices, and *independence* from negative influences of the retailers.
- ◆ **Implications for technology uptake:** Clear and easy to understand information would help people to make smarter, more informed and more confident choices. It would also help them feel confident that the sector is making the right decisions for them and for the planet.

PERCEPTIONS OF NEW TECH & SERVICES – UNPROMPTED

SOLAR WAS TOP OF MIND AND THOUGHT TO HAVE GREATEST POTENTIAL; VERY LITTLE KNOWLEDGE OF OTHER TECHNOLOGIES, WITH SERVICES OFF THE RADAR

Participants were asked to list the new and emerging energy technologies and services they were aware of, and outline what they know about them, their views on them, and what sort of impact they think these will have on the market. They really only thought and knew about *technologies* (ordered from most to least mentioned overall in the table below) and could not really name any *services* – although a small handful mentioned apps from their retailers that let them monitor usage and costs.

| TECHNOLOGY / SERVICE | PARTICIPANTS' UNDERSTANDINGS & PERCEPTIONS | PERCEPTIONS OF POTENTIAL MARKET IMPACT | ILLUSTRATIVE QUOTES |
|----------------------|--|--|--|
| Solar panels | <ul style="list-style-type: none"> Broadly understood Efficient energy generation Panels must be in direct sunlight / intermittent supply Panels have limited life Potential for both on- and off-grid Large financial outlay + limited rebates means very slow returns on investment Frustration over reducing feed-in tariffs | <ul style="list-style-type: none"> Technology is well advanced and proven Thought to have the most potential for widespread use (small and large scale, given Australia's access to sunlight – frustration about delays) Broader uptake is expected to lead to costs continuing to fall | <p><i>"I'd like to see longer lasting panels."</i></p> <p><i>"The more alternatives there are, the lower the cost is going to be across the board."</i></p> <p><i>"The initial cost to set up solar, it will take 10 years to pay it off. You have to look ahead for a long time."</i></p> <p><i>"Australia has the most sun."</i></p> |
| Batteries | <ul style="list-style-type: none"> Limited understanding Charge up during the day and allow you to draw down the energy at night, so saves money on peak usage Thought to go with solar, not standalone | <ul style="list-style-type: none"> Once understood, expected to be a game changer for solar usage Potential ability to trade/sell stored energy has some novelty appeal, but few saw themselves actually doing it | <p><i>"I see it as going hand-in-hand with solar."</i></p> <p><i>"If you know how much you have stored, you might say, 'Okay, let's use it.' You know how much you have to play around with."</i></p> |
| Wind | <ul style="list-style-type: none"> High awareness of wind farms, but little knowledge of any other aspect Some health concerns with turbines Virtually no awareness of micro-turbines that could be used within a domestic setting (though one participant had one) Lower-level concerns about visual impact on natural landscapes | <ul style="list-style-type: none"> Seen as a proven technology Believe it is impacting the market now, but is yet to meet its full potential Some concern about the intermittent nature of wind Some sense off-shore farms have potential for more acceptance (out of sight / earshot) | <p><i>"Using the sun, wind or any other new technology to power my home seems natural and the smart way to go."</i></p> <p><i>"I often wonder whether smaller windmills could be added to homes and businesses to generate power."</i></p> |

PERCEPTIONS OF NEW TECH & SERVICES – UNPROMPTED CONT'D

SOME SENSE KINETIC ENERGY COULD HAVE A VALUABLE ROLE. FEARS ABOUT NUCLEAR, THOUGH A SMALL MINORITY SEE IT AS A POTENTIAL SOLUTION

| TECHNOLOGY / SERVICE | PARTICIPANTS' UNDERSTANDINGS & PERCEPTIONS | PERCEPTIONS OF POTENTIAL MARKET IMPACT | ILLUSTRATIVE QUOTES |
|----------------------|---|---|--|
| Wave | <ul style="list-style-type: none"> Little was known about this technology but it sounded very appealing and promising as a renewable and clean energy source | <ul style="list-style-type: none"> As yet thought to be unproven in the market, with little sense of how it could be broadly deployed, but recognition that supply is perpetual | <p><i>"Wave generation has also been discussed but nothing too serious at the moment I believe."</i></p> <p><i>"Wave has had some success, but is still forming."</i></p> |
| Kinetic | <ul style="list-style-type: none"> Vague knowledge of the ability to harness power generated by human activity e.g. 'pedal power' at gyms, clothing that can generate electricity on movement | <ul style="list-style-type: none"> Seen mostly as a small-scale technology for individual use However a few thought perhaps there is potential for large installations – e.g. in roads, triggered by pressure from cars or in footpaths for pedestrians | <p><i>"Gym farms as well as wind farms!"</i></p> <p><i>"Pedal power – well established, more so than geothermal."</i></p> <p><i>"I've heard about tiles you can walk on in Germany or something."</i></p> |
| Nuclear | <ul style="list-style-type: none"> Limited understanding, with quite strong fear and concerns about risks and dangers associated with production as well as storage of nuclear waste A few (male) participants thought it would be clean and efficient, but the process was not really understood | <ul style="list-style-type: none"> Seen as established overseas A very small minority felt it has excellent market potential, especially for its efficiency, but this was not a strongly held view – indeed the general sentiment was strongly against it | <p><i>"We're scared about nuclear in this country."</i></p> <p><i>"The good thing about nuclear energy is that it's very efficient."</i></p> <p><i>"I think any technology that has dangerous by-products such as nuclear energy is really silly, especially when we have clean energy sources all around us."</i></p> |

REACTIONS TO NEW TECHNOLOGY & SERVICES – PROMPTED

SOLAR SEEN AS ESTABLISHED AND GROWING. HIGH INTEREST IN BATTERIES DESPITE LOW KNOWLEDGE. INTEREST IN ELECTRIC CARS, BUT RANGE WORRIES

When participants were prompted to think about some specific technologies and services of interest, deeper insights were gained into their feelings and concerns, as summarised here from both the focus groups and online discussions.

| TECHNOLOGY / SERVICE | REACTIONS SUMMARY |
|---|--|
| Solar panels – grid connected | <ul style="list-style-type: none"> • Solar technology was generally quite well known and understood. Around a quarter of participants reported having them. • The fact it is a renewable source was highly appealing, however upfront financial outlay was still a large barrier for many. • Those who had already invested were frustrated at the reducing rebates (especially the more recent entrants), as it extends the payback period. They were still satisfied with their decision due to the environmental benefits. • Participants felt there was potential for <i>much</i> broader uptake assuming costs continue to come down, as already witnessed. • Remaining grid-connected was considered important for securing access to enough power, especially if storage is not installed – both in terms of night-time usage and when the sun is not shining. • A few were concerned at the fragility and durability of the panels (e.g. storm damage potential, untested life-spans). • Some assumed the technology would evolve to be smaller, more efficient and ‘smarter’ (i.e. able to work out of direct sunlight or at different tilt and orientation, solar films on windows, solar paints, flexible panels). |
| Solar panels – not grid connected | <ul style="list-style-type: none"> • Only one participant was totally off-grid using solar and battery storage (at their holiday property without mains access). • The idea of independence from the grid was intuitively appealing for the control, cost and environmental benefits it was seen to offer, but there were concerns around capacity to meet needs, especially at night and in emergencies. This led to a majority preference to have the option of remaining grid-connected as back-up. This is discussed further in the next section. |
| Storage batteries – grid connected | <ul style="list-style-type: none"> • Knowledge and understanding of this technology was limited, as discussed earlier in this report. It was seen as ‘bleeding edge’. • Once understood, there was strong interest in saving money through using battery power during peak price periods, and reducing demand on the grid. This was the most aspirational option for householders, combined with solar. A few were also interested in the potential of trading energy they had stored, although most participants could barely grasp this concept. • Some reservations remained, related to what is quite a new and perceived unproven technology, so the idea of staying grid connected especially as a back-up for emergencies provided some reassurance. |
| Storage batteries – not grid connected | <ul style="list-style-type: none"> • Seen as a way to boost the resilience of solar systems. However, not being grid connected creates a sense of risk and even lost opportunity to feed-in. Interest was therefore tempered and dependent on the technology being better understood and proven, and upfront investment costs being driven down substantially. |

REACTIONS TO NEW TECHNOLOGY & SERVICES – PROMPTED CONT'D

SMART METERS AND TIME OF USE TARIFFS QUITE APPEALING; BENEFITS OF REMOTE CONTROL UNCLEAR

| TECHNOLOGY / SERVICE | REACTIONS SUMMARY CONT'D |
|--|--|
| <i>Electric cars</i> | <ul style="list-style-type: none"> • There was high awareness of this technology (many had seen or heard something about it), although there was limited detailed understanding of how it works. Some sense that the technology and charging infrastructure is constantly improving. • Range, battery capacity and lack of charging stations were common concerns, with consumers worried about this only being a technology for city folk (e.g. how far can I get on one charge, what happens if I run out and am nowhere near a plug?). As such, electric cars were currently seen to carry a high risk. A few were also concerned about these being fuelled by coal. • Uptake thought to be a much more of a longer-term prospect – more likely in the next 20 years, rather than 5 years. |
| <i>A smart / interval / digital meter</i> | <ul style="list-style-type: none"> • Generates high interest and considered relatively accessible, once the benefits are eventually understood. • However, initial grasp of the concept was quite confused, including among those in Victoria who all have them in place (e.g. some didn't know if they did, or if they were in use yet, let alone what they are even for). Among those in Queensland and NSW, some had heard of smart meters, but most did not know what they were. • The main questions about smart meters were related to: whether they are read by the energy retailer or by households; where in the home they are installed; the cost to install; whether there is specialist software required to monitor usage; and whether energy retailers have access to usage data (particularly among Victorian participants). • There were also fears among some in Victoria about safety and health impacts associated with the smart meters (e.g. causing fires, headaches and electromagnetic frequency effects), and some others had heard of this in the media. |
| <i>A home energy management system for automatically controlling heating, cooling etc</i> | <ul style="list-style-type: none"> • Participants struggled to picture this and see the benefits. They broadly did not see the task of adjusting their air conditioning or the usage of their appliances as a major inconvenience that required automation or remote control. • A few liked the idea of operating appliances while out of the home, for convenience and even security purposes. • Generally seen as a 'toy' i.e. fun for those into gadgets - but not really delivering significant benefits, whether financial or environmental. <u>However</u>, when online forum participants viewed the British Gas Smarter Living YouTube ad, this generated a great deal of excitement about the possibilities, potential benefits and conveniences of such a system. |

REACTIONS TO NEW TECHNOLOGY & SERVICES – PROMPTED CONT'D

RETAILER CONTROL RAISES PRIVACY FEARS

| TECHNOLOGY / SERVICE | REACTIONS SUMMARY CONT'D |
|--|--|
| <i>Appliances that can be remotely controlled</i> | <ul style="list-style-type: none"> • Reactions to this technology were similar to those for the energy management system. • Although the ability to turn off an appliance which had accidentally been left on was appealing, there were concerns about the need to replace (perfectly good) existing appliances and the potential cost of remote-ready appliances. |
| <i>An app that allows you to remotely control / adjust your appliances</i> | <ul style="list-style-type: none"> • As discussed above, the main concern around this technology was the upfront investment in compatible appliances. • One participant was embarrassed to admit that her boyfriend had such an app – something they had not told their friends because they thought it was ‘geeky’. However, a few envisaged this could become more useful in the future. |
| <i>Giving your energy company permission to remotely adjust your appliances to reduce energy demand peaks</i> | <ul style="list-style-type: none"> • This had the least appeal of all technologies and services presented – indeed some had a visceral aversion to it. • A few participants – mainly younger and more energy/cost-conscious consumers – could see the benefit of the service in protecting them from high bills during peak times, and were prepared to accept a temperature shift in return. • However the majority felt this service took control out of their hands. Fears of ‘big brother’ monitoring, privacy breaches and freedom of choice impacts were raised. Incentives and strict conditions may help to boost interest. |
| <i>“Time of Use” tariffs, with peak, off-peak and ‘shoulder’ rates</i> | <ul style="list-style-type: none"> • This service was one of the most appealing of all presented (along with smart meters). • It was considered accessible in that the tariffs per time period were expected to be easy to understand and work with for estimating cost and managing usage. However, some thought their schedules may limit any benefits for themselves – particularly those who work full time during standard business hours. • There was a perception this would cost nothing or very little to organise other than time to contact the retailer to arrange. |

POTENTIAL UPTAKE



NEWGATE
RESEARCH

ABOUT THIS SECTION

- ◆ This section brings together the learnings from the research and presents an analysis of what may drive uptake of new and emerging technologies and services.
 - ◇ First we have identified and summarised the main barriers and enablers.
 - ◇ We have then assessed each of the 11 specifically tested technologies and services against those barriers and enablers to provide indicative insight into driving uptake for each.
 - ◇ In light of this analysis and the discussions, we also discuss the potential future role of the grid.



CURRENT BARRIERS TO UPTAKE OF NEW TECH & SERVICES

A MIX OF INTERNAL AND EXTERNAL BARRIERS EXIST – MOST NOTABLY A LACK OF KNOWLEDGE AND COST CONCERNS, AS WELL AS A LACK OF INDUSTRY ACTION

The key barriers to uptake of new and emerging technologies include, in broader descending order of mentions and importance:

- ◆ Lack of **awareness and knowledge** of the technologies available, and even more so in terms of new energy *services*, which many struggled to grasp. This was a fundamental and substantial barrier.
 - ◇ Inability to grasp the **perceived need** for the technology or service i.e. what problem does it solve and is it really a problem?
 - ◇ Inability to assess the **scale of the benefit** possible i.e. how much money or time will it save me? What are the options and trade-offs, and can I live with them? Will it make a significant difference to the environment? How much storage capacity do I need?
- ◆ As a result of the above, **cost** becomes significant in that a lack of knowledge hampers the ability to make an accurate cost-benefit assessment until better information is available. For many, including the financially challenged, cost was a genuine barrier.
- ◆ **Physical barriers** to installation/ability to be installed in **any dwelling**: Renters and apartment dwellers assumed solar and battery storage technologies could not fit or be retrofitted into their properties, or that their landlords may not allow it. They lacked awareness of any other options which might make the use of these types of energies possible. This again relates to lack of knowledge.
- ◆ **Energy companies not offering or promoting** them is also a key barrier. This includes consumers being told that the solar capacity in the area had already been reached so they could not connect.
- ◆ **Government hampering progress**, and possibly withholding low-cost new technologies such as fuel cells, quantum energy etc.
- ◆ Some were concerned about the **amount of time** they might have to spend not just learning about the new technologies and finding the best options, but also operating and maintaining the infrastructure. Some also thought this might be all **too hard**.
- ◆ Perceived **reliability** of the technology: while many of the new ideas presented had appeal and sparked interest, there was a natural reticence to commit to technologies not considered to be reliable (uninterruptable supply, functions during emergencies, reliant on a good internet connection) or 'proven' technologies.
- ◆ Perceived lack of **control** over the technology and its impacts: participants were less open to technologies and services that they could not understand and easily manage themselves – e.g. remote control of appliances, especially by third parties such as retailers. The idea of control given to third parties also raised concerns around **privacy and protection of personal data**.
- ◆ Lack of **demonstrable nett environmental benefit**: it was clear environmental protection is important. This potentially means that, while not always as tangible as cost, it will become an increasingly important consideration in the assessment of perceived benefits. A few participants were also cognisant that some apparent advances may still have a nett negative environmental impact.
- ◆ A **'wait and see' inertia** due to a sense that better and more affordable options might soon become available.

"I don't think I know enough about batteries."

"People will go out and spend money on an electric car, and they'll go and charge it at home but it's being sourced from a coal-fired powered station. They're really losing the idea of what they're doing."

"We're renting; try getting anything past a body corporate!"

"I think older people will get cranky with online bills. They'd want to pay their bills the old-fashioned way."

"It'd be good if someone came to your house rather than over the phone, telling you how it's going to look."

"Some people might like the safety net of having the grid there just in case. But as technology improves, it won't be necessary."

ENABLERS OF UPTAKE OF NEW TECH & SERVICES

CLEARLY-UNDERSTOOD BENEFITS, PROVEN RELIABILITY AND ONGOING INNOVATION WILL DRIVE UPTAKE, ALONG WITH SERVICES THAT GIVE CONSUMERS CONTROL

In many ways, the changes participants thought would help to stimulate the uptake of new energy technologies and services were the flipside of the barriers. Here we provide a summary of suggested solution themes.

- ◆ **Information and education:** Building awareness, knowledge and confidence in offerings; what they are, how they work, and installation, purchasing and cost options available.
 - ◇ They also thought this required clear explanations of the problems each technology or service is trying to solve, ease of use, and benefits (including environmental and cost saving potential).
 - ◇ Information was sought in plain consumer language, supported by engaging visuals – especially in video format. Some cited consumer case studies as highly compelling.
 - ◇ Apartment dwellers, renters and vulnerable consumers seek specific information on options which can help them to access and afford new offerings.
- ◆ **Options:** The availability *and promotion* of options for people in different situations and premises is important, as many were concerned (for example) that they either didn't have the right place for solar panels to be installed, or enough space for batteries or other technologies. Therefore flexible options such as small or slim-style batteries, solar films for windows etc. appealed. Solar and battery lease and purchase arrangements appealed greatly.
- ◆ **Costs coming down:** This is an obvious enabler, and something many participants were familiar with in relation to solar, and expected would continue. Subsidies were also sought.
- ◆ **Ongoing innovation.** On the second day of the online forum, participants were asked to do a little research online to see what they could glean about new and emerging technologies. There was quite a lot of excitement generated as a result of the innovations they found, and the potential for efficiency and reliability gains. Still, most focused on products, not services.
 - ◇ The innovations of most interest were: large solar installations including solar roads, 3D printing of solar technology, flexible solar panels, Rawlemon's Crystal Ball, wearable and kinetic generators (especially road and transport related, including car tyres as generators), evolutions in battery technology (e.g. zinc bromide), large scale wind projects including off-shore farms, Microbial Fuel Cell (MFC) technology, chemical reactions (e.g. fuel cells / hydrogen electrolysis), heat exchange units, usage monitors.
- ◆ **Boosting consumer control:** This included removing structural barriers such as solar connection capacity constraints, and the development of demand management services where consumers can choose their own conditions.



"I liked this photo the most because it showed everything I think about when thinking of the energy of the future. The earth represents to me something natural, the solar panels and wind farms represent how clean energy will be in the future, and the sun shining down also shows using natural resources for power."



"I think some technologies have been suppressed by the government, like free energy, and hydrogen splitting, energy from water. I have a manual here for building your own free energy generator by Nikola Tesla."

ENABLERS OF UPTAKE OF NEW TECH & SERVICES CONT'D

EXAMPLES FROM THE ONLINE FORUM ILLUSTRATED THE EXCITEMENT THAT CAN BE GENERATED BY EVEN A BRIEF EXPLORATION OF ENERGY INNOVATIONS



"Imagine being able to print off your own solar powered battery at home. 3D PRINTED SOLAR ENERGY TREES - this will take it to a whole new level. This would be more for the home than businesses, but the application of using it for travelling around the country is mind boggling and they can be decorative as well. The latter, there is a plus because most modern solar energy devices are large, clunky and pretty predictable without much of an appeal."



"This is a photo of a Rawlemon's new Crystal Ball. Which is essentially a spherical lens which collects sunlight and moonlight. This spherical shape collects 10,000 more energy than traditional solar panels which are most efficient at one time in the day. Being able to harvest energy from the sun (the original source of all the energy on Earth) will be the ultimate test for humanity."



"My image is about printable organic solar cells. I don't think this t-shirt is going to power a house or business, but I like the idea that our building materials may someday incorporate solar cells so that the actual building is able to generate electricity."

"Solar roads, what a great idea, turn every road surface into an electricity generating machine. Each road could generate the power for themselves, would be expensive to set up but would continue to generate energy for years at little cost."



"An app! Something we could look at and track at all times. An app that tracks how much energy is being used, what we can do to bring energy consumption down, how much energy we have saved for the quarter."

"The world is getting hotter and hotter. There is a lot of pollution. Developing countries are producing a lot of pollution. Why can't we use solar farms to produce more solar energy, large scale? We should have batteries to store that energy for the producers if they need it!"

POTENTIAL UPTAKE OF TECHNOLOGIES TESTED

The table over the next two pages summarises the findings from the focus group worksheet exercise and discussions (ranked by the average likelihood to use ratings from the semi-quantitative results – which are purely from the worksheets), with extra insight from online forum. The analysis is structured around the key barrier themes.

| TECHNOLOGY / SERVICE | LIKELY TO BUY / USE NEXT 5 YRS (0-10 rating, average score, n=44) | ALREADY HAVE (count, n=44) | AWARE-NESS | BENEFITS CLEARLY UNDER-STOOD | CLEAR PER-CEIVED NEED | PER-CEIVED RELI-ABILITY | CAN BE INSTALLED IN ANY DWELLING TYPE | PER-CEIVED LEVEL OF CONTROL | PER-CEIVED COST | COMMENTS |
|---|---|----------------------------|---------------------------------|------------------------------|-----------------------|-------------------------|---------------------------------------|-----------------------------|-----------------|--|
| A smart / interval / digital meter | 5.8 | 6 | Low to moderate | No | No | Unknown | Yes | High | Low | High interest levels. Benefits around controlling costs need to be better explained, limited concerns on privacy, health |
| “Time of Use” tariffs, with peak, off-peak and ‘shoulder’ rates | 5.7 | 5 | Low to moderate, with confusion | No | No | Unknown | Yes | High | Low | Appealing despite lack of understanding, expected to be quite simple to organise, cost efficient, with immediate savings |
| Solar panels – grid connected | 4.6 | 10 | High | Yes | Yes | Yes | No | High | High | Upfront cost and reduced rebates most significant barriers. Can be hampered by capacity / connection issues. Independence from grid and idea of trading are appealing. Apartment dwellers / tenants concerned they don’t have options to use solar |
| Appliances that can be remotely controlled | 4.3 | 3 | Low | Yes | No | Yes | Yes | High | High | Hard to see the need, even when understand benefits; initial outlay is a barrier; can do this already manually or with timers. Relies on internet connection |
| A home energy management system | 4.0 | 1 | Low | No | No | Unknown | Unknown | High | High? | Seen as a nice-to-have, not a burning need; can do this already manually or with timers. Cost also an issue |

POTENTIAL UPTAKE OF TECHNOLOGIES TESTED *CONT'D*

| TECHNOLOGY / SERVICE | LIKELY TO BUY / USE NEXT 5 YRS (0-10 rating, average score, n=44) | ALREADY HAVE (count, n=44) | AWARENESS | BENEFITS CLEARLY UNDERSTOOD | CLEAR PERCEIVED NEED | PERCEIVED RELIABILITY | CAN BE INSTALLED IN ANY DWELLING TYPE | PERCEIVED LEVEL OF CONTROL | PERCEIVED COST | COMMENTS |
|--|---|----------------------------|-----------|-----------------------------|----------------------|-----------------------|---------------------------------------|----------------------------|----------------|--|
| Storage batteries – grid connected | 3.8 | 1 | Low | No | Yes | Unknown | No | High | High | Interest was high, but cost and knowledge were major barriers. Renters/unit dwellers feel unable to access this technology |
| An app that allows you to remotely control appliances | 3.7 | 1 | Low | No | No | Unknown | Unknown | High | Low | As for energy management system, can do this already manually or with timers |
| An electric car | 2.8 | 0 | High | Yes | Yes | No | - | High | High | Technology not yet proven in Australia; high cost barriers; perceived to have low distance range; not enough charging stations, don't need a new car |
| Solar panels – not grid connected | 2.7 | 3 | High | Yes | Yes | No | No | High | Moderate | Cost of battery storage limits appeal; fear of not having grid as backup; units/renter issues |
| Storage batteries – not grid connected | 2.7 | 2 | Low | No | Yes | No | No | High | High | Potential not well understood – including if it can be used on its own. Reliability will need to be proven, cost a barrier too |
| Giving permission to energy company to remotely adjust your appliances to reduce energy demand peaks | 1.6 | 0 | Low | No | No | No | Unknown | Low | Low | Lack of control and potential privacy concerns; some appeal for vulnerable customers with high usage; younger consumers more comfortable with the idea – especially if they could save money |

THE FUTURE OF THE GRID

INDEPENDENCE FROM THE GRID APPEALS, BUT THE RISK IS TOO HIGH. HARD TO VISUALISE HOW THE GRID WILL ADAPT TO THE GROWTH OF RENEWABLES

After looking at new technologies, participants were asked to think about the future of the grid, specifically in terms of whether they thought large numbers of people might go off-grid and what this might mean for maintaining the grid in the future.

- ◆ Initially, participants found the idea of leaving the grid very appealing from an empowerment perspective, especially those who regularly experience network reliability issues, and those with very strong environment-related values.
- ◆ Specific benefits were thought to be:
 - ◇ Being insulated from network peaks and blackouts;
 - ◇ Being self-sufficient; drawing on freely available local and natural resources while at the same time reducing one's carbon footprint and not being at the mercy of ongoing, increasing energy bills; and
 - ◇ Taking pressure off the grid, which may help reduce costs;
- ◆ However, none had thought through the implications for the grid. When asked, a handful assumed the grid would 'shrink' and adapt to changing energy demand (thus would cost less to run). The discussions revealed there was no real understanding of the nature of the grid; e.g. how it works, is funded and maintained.
- ◆ Thus, when asked to consider who should pay for the maintenance of the grid if a lot of people become self-sufficient in the future, those who were confident they would leave the grid felt that, since they were assuming the risk of managing their own supply, they shouldn't have to be subsidising others who remained dependent on the grid.
 - ◇ However, when it was suggested that those left on the grid would likely be vulnerable and unable to afford the resulting price increases, there was a small altruistic minority who felt a sense of responsibility and willingness to pay extra for grid maintenance – e.g. through some kind of levy.

- ◇ Notably this topic also generated a low-level suspicion that the government was already planning to create a levy of this type; as well as some concern that it would be a retrograde step to ask consumers to subsidise outdated technology.
- ◆ It became clear to participants that the grid would need to remain, and discussions turned to the possibility of allowing those who were mostly off-grid to retain a grid connection as back-up supply.
- ◆ This generated a good deal of support as participants began to discuss the potential risks associated with taking up new technologies that were not yet proven – in particular storage.
- ◆ Eventually, the consensus was that the risk of being entirely off-grid was currently too high and the grid was certainly needed for the time being.
- ◆ Indeed, a few felt it was selfish to disconnect, when household solar producers could be helping to support the grid's resilience. Others liked the idea of being able to generate income by staying connected.

"Solar depends on the weather – and you can't always depend on it."

"The grid is a safety thing. I like having that security."

"I will definitely be off the grid in 5 years. I've been working my way up to it."

"You're too dependent to go off the grid. If someone worked out how much power they used in total and that they'd have to duplicate that from their own capacity..."

"I think it's unlikely people will want to completely go off-grid."

"The thought of being able to power the home naturally and selling energy back to the grid is appealing."

"There will still be a need for a grid, or perhaps several with a bit of competition."

"If you have money, there's a lot of choices and alternatives from the grid. Renters will be limited to what landlords decide."

"I think more people will be living off the grid or switching to gas where possible. Especially if electricity prices keep increasing."

THE FUTURE OF THE MARKET AND COMPETITION



NEWGATE
RESEARCH

FUTURE ENERGY MARKET IMPACTS

LITTLE CHANGE IN THE NEXT 5 YEARS, BUT A SENSE THE ENERGY LANDSCAPE WILL BE VERY DIFFERENT IN 20 YEARS. ROLE OF SERVICES STILL HARD TO GRASP

Asked to imagine the future impact of the technologies they had been shown, participants continued to find it easier to think about the future of product technologies rather than energy-related services, which they struggled to grasp even after considering examples. They were asked to think about a 5 year horizon and a 20 year horizon.

- ◆ Participants believed that very little will have changed in the next 5 years.
 - ◇ There was a strong expectation that uptake of solar and storage batteries will have increased as the technology becomes more available and accessible, and costs come down.
 - ◇ Despite home management systems being around now, few thought usage would be widespread within this timeframe, mainly due to their lack of awareness and understanding of what it would involve. This was also coupled with an inability to truly grasp how it could give them the control they want over their costs, and provide genuine benefits and conveniences in their day to day lives. A couple of people also raised the difficulty in retrofitting these systems and trying to get different technologies to interface correctly with the overall system.
- ◆ Most participants were acutely conscious that a lot can change in 20 years, citing the ubiquity of smart phones and the way they have transformed many people's lives. This implies a general confidence in the ability of technology to have profound impacts.
 - ◇ Despite this confidence in 'big' ideas, they really struggled to conceptualise what some of those ideas or innovations might be – especially in terms of energy-related services.
 - ◇ Some thought technologies like solar panels or solar windows would be in place as a standard feature in any home or business.
- ◇ Indeed there was a strong expectation that the future of energy lies in all kinds of renewables.
- ◇ There was some discussion (mainly in the online forum where participants had the opportunity to do some of their own research) about a proliferation of community energy networks and local generation models. This was appealing to many participants and relates back to their broader desire for control over supply, usage and costs, as well as environmental benefits. Naturally this would have implications for policy-makers in terms of regulating and providing supply surety.
- ◇ Some hoped that the energy industry and government would have adapted their roles to facilitate a greater focus on renewables.
- ◆ A few participants, however, were more pessimistic and demonstrated a sense of dread that it was all going to be 'too little too late' and that the uptake of renewable energy technologies would be too slow to arrest the impacts of climate change. These participants envisioned a darker future in which people were experiencing increased negative social, financial, environmental and health effects as a result of today's energy system.
- ◆ Participants in the online forum were given links to various videos related to new technologies. As noted earlier, they were particularly impressed by a British Gas YouTube ad. Many felt it helped them to better understand what a home energy management system could look like and what the benefits would be, and that it was realistic to expect such systems would become mainstream in future. This illustrated the power of videos in both educating and inspiring consumers.
- ◆ The discussions led participants to conclude that there would likely be substantial changes within 10 years' time.

FUTURE ENERGY MARKET IMPACTS CONT'D

A STRONG SENSE NEW TECHNOLOGIES WILL HAVE MADE SIGNIFICANT MAINSTREAM IMPACTS WITHIN THE NEXT DECADE ... BUT WILL IT BE ENOUGH?

"It will really snowball too, once you see some of that technology you just want to use it and benefit from it."

"We thought it was harder to predict what's going to happen in 20 years. In five years, solar and wind – the same as now."

"Their energy might become so expensive, they'll have to change."

"In five years, there might be a change in attitudes and everyone will have more information, be more willing to change; people don't have enough information now."

"What happens if the batteries malfunction? How long will it take to have them repaired or replaced? What happens in the meantime? I would hate to be off the grid and relying solely on solar and batteries."

"The ship in the wave image; we're going into the disaster, I think it's too little too late from an environmental point of view. We've screwed the world, and it's only when we start running out that we start moving towards things that start to help. This all should have come in a while ago and it would have been much more beneficial. 'New and emerging' doesn't always mean good for the environment, unfortunately."

"The Catalyst programme was very good. Yes, the predictions will definitely reflect reality to some extent."

"I think the vision of self-powered communities is nice, but a little rosy. I still think economies of scale will be hard to beat as energy generation technology improves... I think the British Gas video is a plausible vision of a middle class home in 10 years."

"I can see the bigger companies becoming much smaller. Due to how self sufficient we are all already becoming."

"I am concerned about how long it will take us to get off using fossil fuels and whether there will be any permanent or long term damage to our environment due to our use of fossil fuels. I would be seriously worried if we adopted nuclear energy or accept nuclear waste. I am really optimistic that in this technological age, smart simple clean technologies will grow exponentially and we will soon be spoilt for choice. We will look back at our use of fossil fuels like we look back on medieval times."

"The British Gas one had very soothing music to undergird the message it was delivering, that almost helped you think this is not just futuristic, it will become generally accepted."

"I think in 20 years, we will be largely self sufficient residentially and on our way commercially. I can certainly imagine households like the one in the British Gas ad. It'd be great if commercial energy was mostly supplied by excess residential energy!"

CONSUMER PROTECTIONS

CURRENT PROTECTIONS ASSUMED ADEQUATE, THOUGH REGULATION OF INDIVIDUAL MARKET TRADING MAY BE A SPECIAL CASE. SIMPLICITY IS IMPORTANT

Although not a key objective of the research, participants were asked about their expectations regarding how their rights as a consumer should be protected in relation to the new technologies and services which are becoming available.

- ◆ Participants struggled to think of the ways in which consumers should be protected in the future. This largely reflected a distinct lack of familiarity and engagement with *existing* protections.
- ◆ When asked about the sorts of things which *could go wrong* with using these technologies and services, this helped participants to suggest a range of scenarios, including:
 - ◇ The danger of technology provider companies (e.g. solar and battery providers) going out of business;
 - ◇ Issues with internet dropouts for small-scale generators trading energy online or relying on online apps to manage appliances;
 - ◇ Hazards from faulty products – e.g. fires or explosions;
 - ◇ Not having a back-up plan if technology fails, particularly if consumers have disconnected from the grid or increased home generation has made the grid unviable / unreliable;
 - ◇ New technology being unreliable (e.g. air conditioner not turning on as programmed), particularly if damage is incurred;
 - ◇ Being overcharged and taken advantage of by unscrupulous operators, especially given that consumer knowledge is limited;
 - ◇ Hacking and other invasions of privacy when internet-connected appliances are in the mix;
 - ◇ Unexpected expenses associated with technology repair and replacement, especially from unforeseen damage (e.g. pests or climate change effects / storms damaging solar panels);
 - ◇ Negative environmental impacts associated with energy wastage, accidents and nuclear waste.

- ◆ After grappling with these ideas, many participants eventually came to a view that any ‘hard technology’ product such as batteries, solar panels etc. should be protected by appropriate warranties. Given the scale, size and importance of these technologies, the appropriate length was thought to be at least 5 to 10 years, but that this should be guided by the expected life of the product.
- ◆ Incidences of business failure (something one or two solar users had experienced) was broadly thought to be covered by Australian consumer laws and available sources of recourse (e.g. ombudsman, legal action). Protections for energy-related services were assumed to be included in both existing consumer law and business/fair trading legislation – though again, most were unsure.
- ◆ There was some debate over how individual trading on the energy market would be managed. Some thought there might be individual contractual arrangements which cover that, while some surmised there may be general industry trading rules which could be adapted for this purpose.
 - ◇ Internet dropouts for traders, and any resulting losses, were expected by some to be covered by existing consumer law.
- ◆ One of the key issues raised was the idea of ensuring protections are kept as simple and accessible as possible and utilise available frameworks which possibly need better promotion. However, a few noted that truly disruptive technologies have the potential to cause significant and unexpected challenges for policy makers.

"If you don't have enough information, people could charge what they want – like going to get your car fixed and not knowing much. It'd be good to have someone looking over you, monitoring the pricing."

"I would not like to rely on operating my appliances from a mobile phone. I could come home and find my dinner not cooked, the washing not done and the house hot! After a hard day at the office, this would be the last straw!"

APPENDICES

- 1: Example Sentiment Worksheets
- 2: Research Instruments



NEWGATE
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APPENDIX 1: EXAMPLE SENTIMENT WORKSHEETS

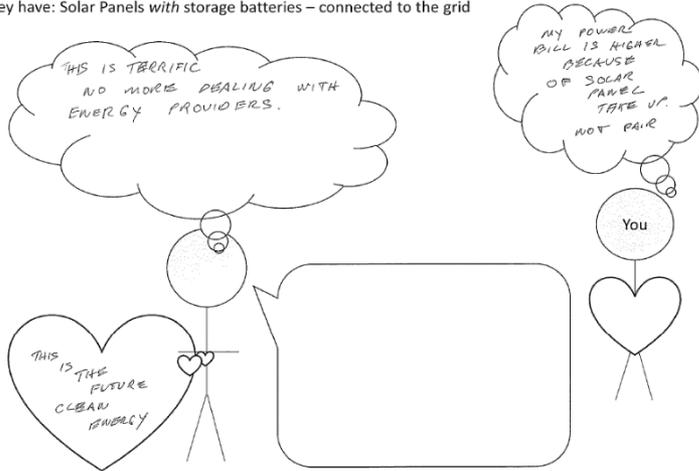


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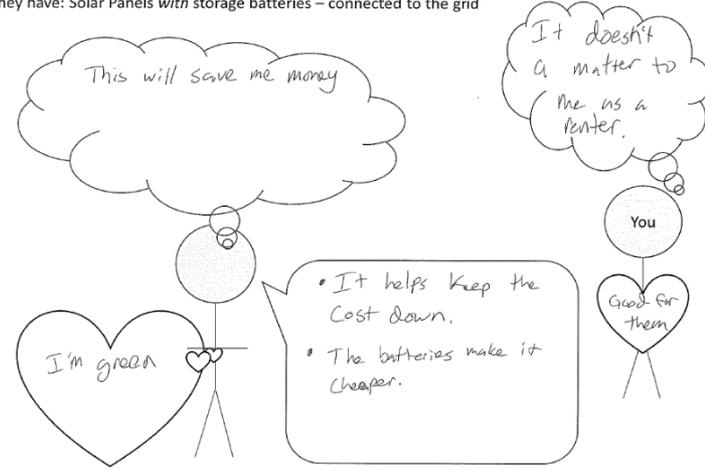
'THINK, FEEL, SAY' RESPONSE EXAMPLES

GRID-CONNECTED SOLAR WITH STORAGE: ASPIRATIONAL, INSPIRES PASSION

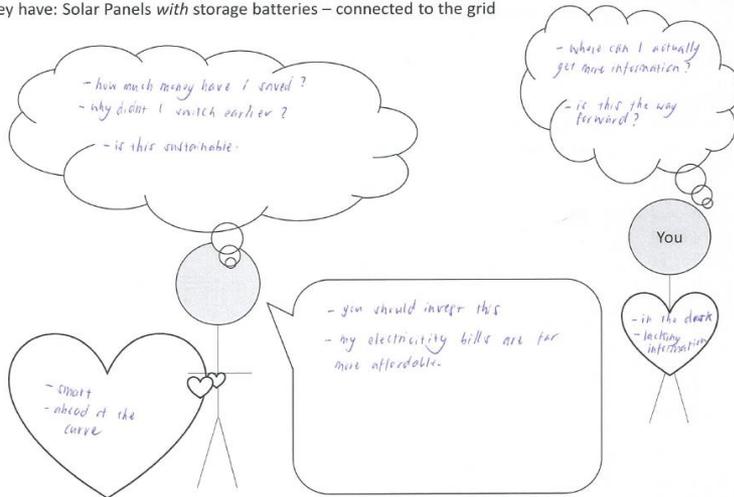
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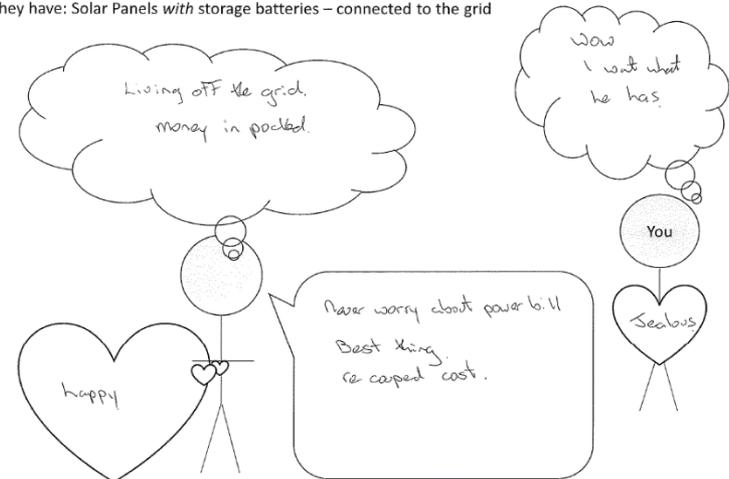
They have: Solar Panels with storage batteries – connected to the grid



They have: Solar Panels with storage batteries – connected to the grid



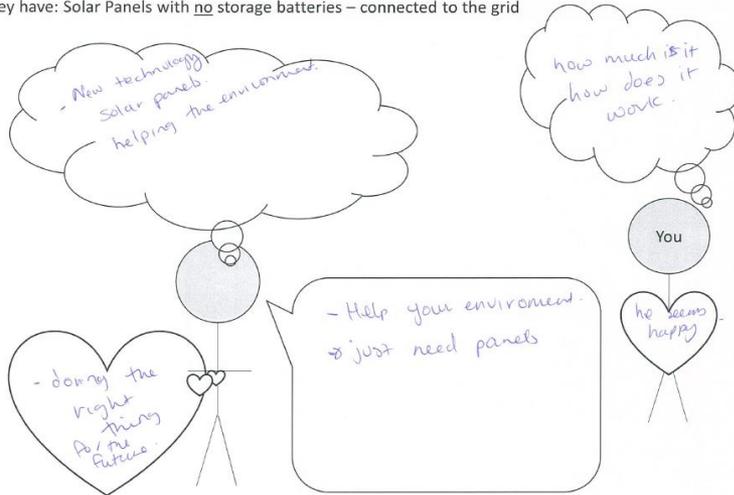
They have: Solar Panels with storage batteries – connected to the grid



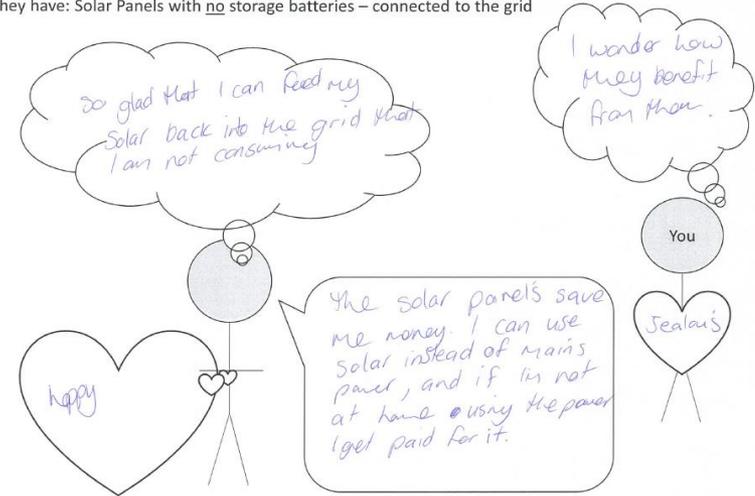
'THINK, FEEL, SAY' RESPONSE EXAMPLES CONT'D

GRID-CONNECTED SOLAR, NO STORAGE: STILL ASPIRATIONAL, BUT LESS PASSION

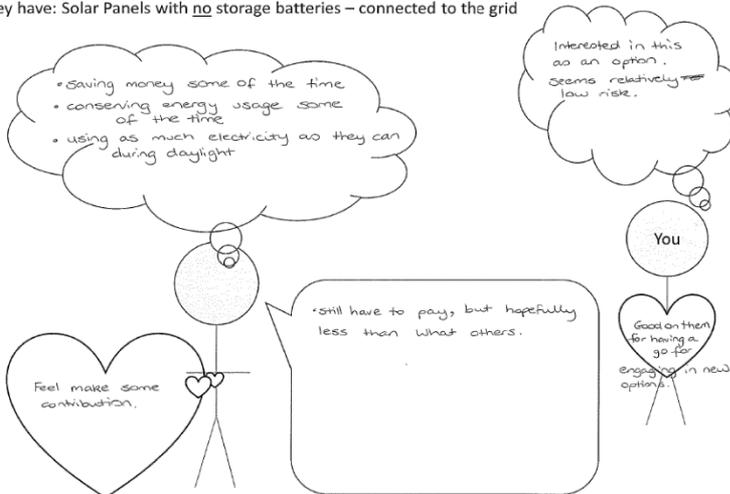
They have: Solar Panels with no storage batteries – connected to the grid



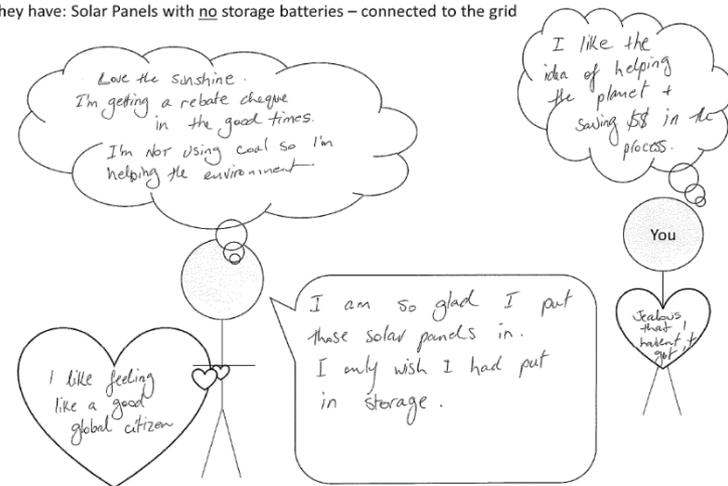
They have: Solar Panels with no storage batteries – connected to the grid



They have: Solar Panels with no storage batteries – connected to the grid



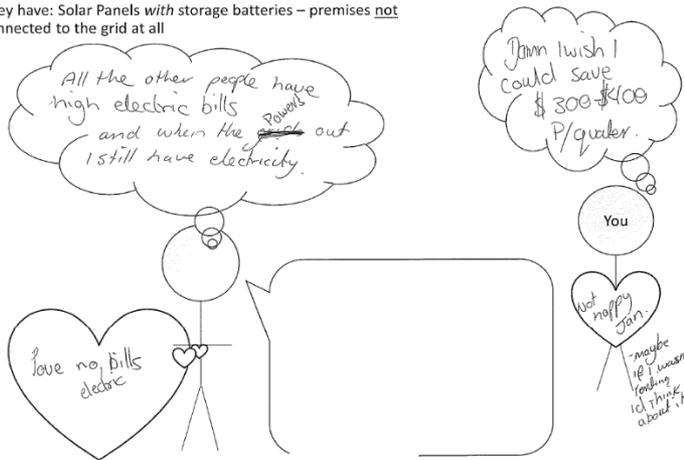
They have: Solar Panels with no storage batteries – connected to the grid



'THINK, FEEL, SAY' RESPONSE EXAMPLES CONT'D

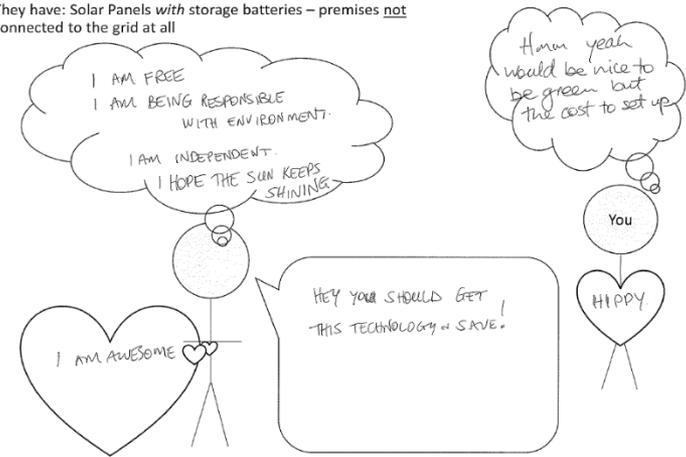
SOMEWHAT LESS APPEAL FOR OFF-GRID SYSTEMS & HOME ENERGY MANAGEMENT

They have: Solar Panels with storage batteries – premises not connected to the grid at all

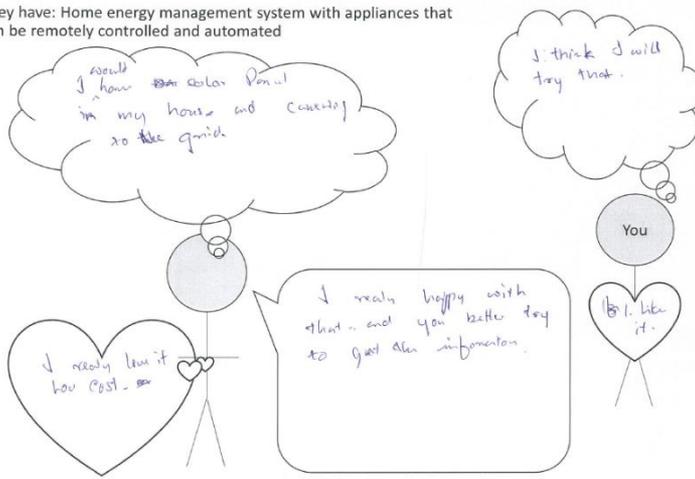


[Off-grid] "He thinks: 'I'm doing my part in saving energy', he feels good about this. He says to me, 'You too could possibly do this: create your own energy and save money with not too much trouble'. I would be interested in that if the information was explained to me and made more manageable to understand."

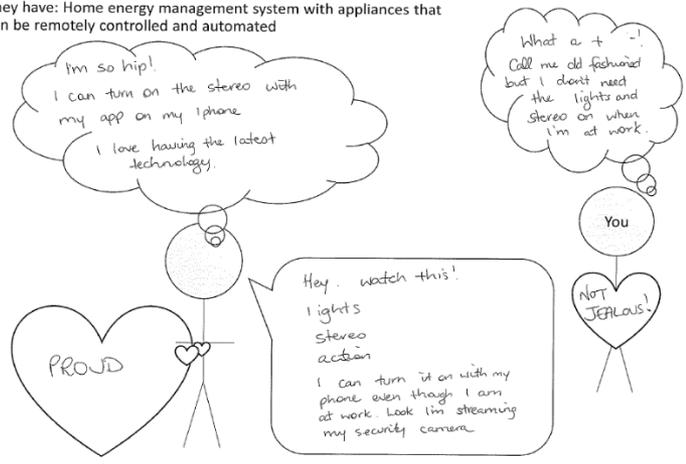
They have: Solar Panels with storage batteries – premises not connected to the grid at all



They have: Home energy management system with appliances that can be remotely controlled and automated



They have: Home energy management system with appliances that can be remotely controlled and automated



APPENDIX 2: RESEARCH INSTRUMENTS

- A. Focus Group Discussion Guide
- B. Online Community Discussion Guide
- C. Online Community Live Chat Guide



NEWGATE
RESEARCH

APPENDIX 3A: FOCUS GROUP DISCUSSION GUIDE

AEMC 2016 Retail Competition Review

Focus Group Discussion Guide

February 2016



The following discussion guide is designed to assist the facilitators in exploring and understanding consumers' knowledge and awareness of and propensity to take up new and emerging technologies in the energy market. The questions are provided as a guide, while participants may raise additional topics for discussion. Accompanying this document are some information sheets and worksheets. Additional probing questions will be asked as required, as time permits.

Introductions 10 mins

Objective: Set the scene for the discussion, make participants comfortable, housekeeping. Participants to introduce themselves.

- Welcome everyone and thank you for coming along tonight! I work for Newgate Research - an independent market and social research company. [Introduce note-taker]
- Today we're going to talk about important issues that can affect energy users like you. We're doing this research for the Australian Energy Market Commission (or the AEMC), which makes the rules on how the energy markets in Australia work, and they advise the government on this as well. [Introduce observer/s if in the room, explain one-way viewing mirror if using]
- We are doing a number of these group discussions and we always make sure we include the views of a mix of people of different ages and who are at different stages in their lives and we're keen to hear from each and every one of you. There's a few things we want you to keep in mind:
 - No right or wrong answers; not looking for experts; if you don't know something, let us know.
 - We don't need you to agree. Speak up if you have a different view.
 - Speak one at a time so everyone can hear and have a chance to respond.
 - We're here for about 2 hours and have lot to get through: please don't be offended if we have to move the conversation on.
- Everything you say is strictly confidential; we don't identify you in any way in our reports. Newgate Research operates under very strict privacy laws; but if you're not comfortable discussing something, just let me know.
- Point out recording devices and reassure recording stays with Newgate.
- Mobiles off, toilets and exits. Please eat up!
- Participant introductions around the table, have questions written on board: Tell us a little bit about yourself... Note that some of you may have been invited along specifically as a business consumer - you'll have that noted on your name-tag. So please respond with your business hat on this evening (if there's time you can also comment as a householder but please state when you're doing that so we understand your views).

| RESIDENTS: | BUSINESSES: |
|---|--|
| <ul style="list-style-type: none"> What you do during the day; | <ul style="list-style-type: none"> Type of business, your role there; |
| <ul style="list-style-type: none"> Who's in your household; | <ul style="list-style-type: none"> Number of people in the business; |
| <ul style="list-style-type: none"> Own/mortgage/rent? | <ul style="list-style-type: none"> Own/lease premises? |
| <ul style="list-style-type: none"> House or apartment? | <ul style="list-style-type: none"> Type of business premises |
| <ul style="list-style-type: none"> Energy company - electricity and gas | |
| <ul style="list-style-type: none"> Low/medium/high users of energy | |
| <ul style="list-style-type: none"> Do you have: solar panels, special meters or use any other energy technologies or services? | |

NGR 1509005 AEMC 2016 Retail Competition Review
Focus Group Discussion Guide - New and Emerging Technologies

New Technology Perceptions and Motivators 10-15 mins

Objective: Warm-up. Explore feelings and drivers around new technology, and high-level concerns using symbolic analysis.

[Ask participants to stand and view assorted deck of random picture cards.]

I'd like you to stand in front of the pictures and choose one or two cards while you think about the topic I'm going to give you. This works best if you don't think too hard about it. Just hold the topic in your mind, look at the pictures and choose what best reflects your thoughts and feelings about the topic. Then come back to the table and we'll discuss.

The topic is: New and emerging energy technologies and innovative services for homes and businesses - specifically electricity. I'd like the first picture you choose to reflect how you feel about these in general. Just choose the picture which best reflects your thoughts and feelings about new and emerging energy technologies and services. Then, I would like you to think about any concerns or negative feelings you have about the topic, and I'd like you to pick a card that you feel reflects that. Now, if the first card you pick about your general feelings already reflects your concerns, then it's fine for you to pick only one. Note that 'new' includes things that may have been around for a while but would still be new to many people, and 'emerging' includes things very few if any people have, which might only be in the early development or concept stage.

Go around the table and ask each to describe their first image and why they chose it. Repeat for concerns. Explore relative weight / importance of the two cards.

Current Perceptions, Experiences & Knowledge: Energy Industry in General 20 mins

Objective: Understand knowledge of current energy market, pricing and challenges. Briefly touch on experiences for context.

Energy Issues & High Level Experiences (5-7 minutes)

- What do you think are the big issues affecting the provision of electricity and gas at the moment?
 - Have you read or seen anything in the media about energy issues recently? [Probe]
 - What do you think will be the big challenges for the industry in coming years? [Probe]
- And what are your broad feelings about your current energy and gas companies? Did any of you bring along anything that reflects your feelings and relationship with energy? Please share your show and tell. [Explore]
- Hands up if you've changed energy company in the last 5 years? Keep your hand up if that was in the last year. Were you happy with the decision? The process?
 - Have the rest of you looked into switching but not changed? Why was that?
 - Time permitting: repeat for changing plan or deal.

Market Knowledge: Supply, Distribution (5-10 minutes)

- How much would you say you know about the electricity system and how it gets to your place? Hands up if you know a lot, a fair bit, not much or not really anything?
 - [Explore in detail, start with those who know least] Physically, how does it get to you? What systems or technologies do they use, do you think?
 - What are the different parts of the supply chain and types of organisations involved along the way?
 - Check for awareness of generators, transmitters, distributors and retailers if not mentioned.
- (Very briefly) How much would you say you know about the gas system and how it gets to your place? Hands up if you know a lot, a fair bit, not much or not really anything?
 - [Explore] Physically, how does it get to you? What systems or technologies do they use?
- How do you generally feel about the way electricity and gas are delivered to you? Are you positive, neutral or negative about how energy supply works at the moment? [Show of hands. Briefly explore why.]

NGR 1509005 AEMC 2016 Retail Competition Review
Focus Group Discussion Guide - New and Emerging Technologies

APPENDIX 3A: FOCUS GROUP DISCUSSION GUIDE *CONT'D*

Knowledge about Billing and Pricing (5-10 minutes)

- Let's talk about how you are billed for your electricity usage...
 - Can anyone tell me what the main components of **electricity** costs are? What are you being charged for? *[Write on board – probing for which are fixed versus variable, differences between residential and business, different types of tariffs]*
 - What about **gas**? *[Write on board]*
- Looking at the components of the supply chain – what proportion of your bill do you think each of these make up? *[Explore residential versus business]*
- Does anyone know who makes the decisions on what each of these components should cost? *[Probe on any government references for specific names or knowledge]*
 - QLD ONLY:** Do you know if there are any changes coming up in South East Queensland in terms of energy price regulation? *Pause.* Hands up if you'd heard prices will be deregulated from 1 July?
- What are the different ways people and businesses can be charged for and buy energy – are there options?
- Do you know if there are going to be different ways people can be charged for energy in future?

Understanding, Current Uptake, Potential Impacts of New Technologies 20 mins

Objective: Explore understanding, points of clarity/confusion around new products and services, current uptake and interest.

Awareness and Understanding of New and Emerging Technologies (~10 minutes)

- I'd like to make a list now of the sorts of new and emerging technologies and innovative services you're aware of in relation to energy. Even if you know the name of it and nothing else, I'll pop it up. *One per sticky.*
 - Explore whether they can be grouped into categories and what the categories are – prompt only if necessary: e.g. new but established, emerging early days, more popular, less popular, hard vs. soft technologies etc. *[Time permitting use 'wave metaphor' technique – draw a large wave and discuss which ones are forming, about to land, established, and passing/dying.]*
 - How much do you know about these? Which ones do you want to know more about?
- TIME PERMITTING, SELECT SOME (BATTERIES & OTHERS MORE SO THAN SOLAR) AND EXPLORE:**
 - What's your understanding about how they work/what they are for/what it does?
 - How do you think this product/service might change how people use their energy, or how they might behave in other ways?
 - Do any of you have any of these products or services? Tell me about them. *[Explore reasons for getting / using them, positives, negatives, what might need to be improved etc.]*
 - What do you want to know about these, if anything?
 - Have you heard of other people getting any of these technologies? *(Particularly interested in storage batteries and other new tech – not so much solar here)*
 - What about the broader impact on the community as a whole? Do you think this product will change the market in some way? *[Probe how.]*
 - Are there other benefits or drawbacks you can see for this product/service?
 - How long do you think it will be around for?

THINK, FEEL, SAY (5-10 minutes)

- HAND OUT 'NEW TECH THINK, FEEL, SAY' WORKSHEET WITH BUBBLES: THINK** (thought bubble), **SAY** (speech bubble), **FEEL** (heart-shape), each with an image of a key product/service, and a stick figure representing a person who might own that product or use that service)

- I'm going to ask you to look at the product or service on your sheet and write down what you think a person who might own that product or use that service would Think, Say and Feel about the fact that they own or use it, including why they might have it, positives and any concerns they might have. There's also a box for you to write down what you think and feel about that person. Take a few minutes to do this then we'll discuss as a group.
- SUGGESTED TECHNOLOGIES (WITH TWO PER GROUP TO WORK ON EACH):** 1. Solar panels with no storage batteries – connected to the grid, 2. Solar panels with storage batteries – connected to the grid, 3. Solar panels with storage batteries – premises not connected to the grid at all, 4. home energy management system with appliances that can be remotely controlled and automated.
- GO AROUND TABLE AND EXPLORE RESPONSES AND THEMES. OTHERS TO COMMENT ON OTHER TECHNOLOGIES THEY DIDN'T COVER**

[Be here by 1 hour, 10 minutes at the latest]

Future Uptake and Issues 25-30 mins

Objective: Explore potential uptake, identify barrier and enablers, role of cost and role of regulation.

- HAND OUT 1-PAGE INFOGRAPHIC (A3).** I'd like you to spend a few minutes having a look at this information, which gives you an overview of the energy network and new products and services. I'd like you to mark up anything on this that you find really interesting or exciting, and anything that's hard to understand put a '?' next to. *Very briefly discuss – likes, dislikes, surprises, anything hard to understand, usefulness etc.*
 - Give examples of how some of the technologies might work: e.g. it might mean you could dry your washing when the price of electricity is cheaper, charge your batteries when the price is lower then use them when the price is higher, or you could cool or heat your house remotely before you get home from work, or you could save money by lowering your energy use when it is really expensive.
- [HAND OUT WORKSHEET & EXPLAIN]** I'd like you to each fill in this sheet. I'll give you a few minutes.
 - First column:** how likely you think you will be to buy or use each product or service in the next 5 years? Scale: 0 = not at all likely, 10 = extremely likely. If you already have it, there's a box for that as well.
 - Second column:** Any notes about why you're likely or unlikely to buy or use these.
 - [Once completed, whip round and ask which product/service got their highest and lowest ratings for likelihood of getting and why.]*
 - Solar panels – grid connected
 - Solar panels – not grid connected
 - Storage batteries – grid connected
 - Storage batteries – not grid connected
 - An electric car
 - A smart / interval / digital meter for your electricity use
 - An energy management system which automatically controls your heating or cooling thermostat and appliances according to your settings
 - Appliances that can be remotely controlled (e.g. air conditioners that can be adjusted, switched on / off remotely)
 - An app that allows you to remotely control / adjust your appliances (e.g. heating / cooling, washing machines)
 - Giving your energy company permission to remotely adjust your appliances to reduce energy demand peaks (e.g. temperatures up/down, switch on/off)
 - Going on to a "Time of Use" tariff, which has peak, off-peak and 'shoulder' (in-between) rates
- Thinking about these sorts of products and services, which ones do you think will be the **most widely used** in the next 5 to 10 years? What about in 20 years' time? *[Probe: what will drive that, what might hold it back?]*

APPENDIX 3A: FOCUS GROUP DISCUSSION GUIDE *CONT'D*

- And which do you think may have limited appeal or not get fully off the ground? [Probe reasons: what will hold it back? What would need to change or happen for it to succeed?]
- For those you don't have but are interested in, what would be the trigger for you to look into it further?
 - And what might prompt or trigger you to actually get / purchase / start using the technology? What factors would you be considering? What would you want to know about them? [IF 'COST', SAY: We'll get more into that a bit later. Explore for other ideas.]
 - Bundling products and services with one company is a way some consumers save money and time. How interested are you in the idea of bundling your purchase or use any of these technologies together – e.g. if you took up solar would it automatically include storage batteries, and a home energy management system, or some other combination (including other home services like internet, phone, insurance)? How do you see this working?
 - How important do you think these new technologies and services will be in your decision to choose a particular provider, if at all? Will companies offering them appeal more / less? Why?
- For those you would be unlikely to use/own in the next 5 to 10 years, what would be stopping you? Is there anything that would need to change to make you give it a go?

CONSUMER PROTECTIONS – MUST ASK

- [If regulation/protection not already mentioned] Do you think buying these sorts of technologies should be just like buying a TV or a microwave where there might be warranties from the company selling them but no regulated protections for consumers? Or whether because they relate to energy do they fall into a special category where there should be some kind of specific consumer protections – like some special laws or regulations to protect people like you if they took these up – or is that unnecessary? What would it look like?
 - Prompt example requirements if necessary: that customers be provided with clear or specific information; that the customer must explicitly consent to particular aspects of an arrangement; or that direct, specific regulation to standardise the products or arrangements that can be entered into.
 - Explore for the different types of products and services... What do you think could go wrong? Should there be any special laws / regulations to protect consumers who buy any of those things on your worksheet? What about for those who decide to disconnect from the grid? What about for those with solar panels? Or those with a home energy management system etc...
- How different would this be from the current protections? Do you know what is in place in the energy market to protect consumers now? Is that something you've thought about before?
- I'd like you to think about a scenario in which a whole lot of people go completely off the grid, leaving only a few people left to pay for the maintenance of the electricity network system. What do you think about that?
 - How likely do you think it is? What might happen to consumers? To the energy companies?
 - Should there be obligations or requirements on the people who disconnect from the grid due to implications it may have for the grid and other consumers? Who should benefit? How?
 - What would be fair in terms of who pays for the grid? How do you think the payment approach should be worked out?

COSTS

- [If cost not already mentioned] Where does cost come in to the equation – how important a factor would it be in your decision to get these products or services? Which of these products or services are more likely to falter because of the cost? Are there ways this could be addressed? [Explore]
 - [Referring to worksheet] Do you have much of a sense of how much these things would cost? Which ones do you think are the highest and lowest cost at the moment, or do you have no idea?
 - [For each mention] What do you think would be a reasonable cost for that product/service? [If already have that product or service.] What are your thoughts on the current price? Is there a price point that might make that more appealing to others? What if you could rent or lease any of these?

- How much would they have to come down in price for you to seriously consider buying / using? If lower than now - how long do you think it would take for them to reach those prices?
- To what extent do you think about the price in terms of how long it might take for them to 'pay for themselves' (e.g. through the savings) ... e.g. for the costlier ones it could take 5 or 10 years? Or the time it might take for you to pay off the initial purchase price?
 - Alternatively: does the idea of leasing / renting the technology from an energy company interest you?

Future Projection

20 mins

Objective: Imagining the future energy consumer.

- [HAND OUT WORKSHEET & DIVIDE INTO PAIRS – DOESN'T HAVE TO BE THEIR DIRECT NEIGHBOUR]: Sheet has columns for 5 years and 20 years, rows for:
 1. What are the main energy technologies consumers will be using (and why);
 2. What energy services are consumers using (and why – e.g. will there be companies helping them to manage their energy remotely, or information sources helping them to manage their own energy, or something else? Why?);
 3. Getting electricity and gas to and from homes and businesses (e.g. how many people and businesses will be on the grid and off the grid, will they be using local area / community scale networks as well / instead of the main grid etc?);
 4. What sort of companies will be providing energy products and services e.g. energy retailers, energy distribution companies, telecommunications companies, internet or home security providers, others?;
 5. How will consumers want to interact with companies offering energy products and services (and why)?;
 6. How different will it be from now (and why)?
- Now that we've thought about current new and emerging energy technologies, products and services, and the associated issues, I'm going to ask you to work in pairs to paint a picture of the future energy consumer – in 5 years' time, and in 20 years' time. I'd suggest you do the whole thing for 5 years first, then 20. Explain worksheet. Think really creatively about what consumers might want in terms of energy technologies and services, and how they might interact with the energy market and their energy providers. To help you think about how much things can change, perhaps reflect on 20 years ago and how people probably couldn't have imagined the impact of mobile phone technology and the role and services phones now play, or people even not having a landline ... how might those sorts of changes, for example, translate into the energy space? Think about how consumers will be using and controlling their energy – e.g. digital interactions, apps, whether things will be remote and automated, the ability to look online at your live energy use and costs so you can then make changes, produce and sell energy, community scale energy networks etc.
- I'm going to give you about 8-10 minutes for this, so you'll need to work quickly! Just write down as much and as quickly as you can – every thought or idea is valid, no matter how big or small. Bullet points, not full sentences.
- [Help groups to work through / keep pace, then bring back together and discuss – white-boarding key themes and features of the overall vision at 5 years and 20 years.]
- Now that we have imagined the future, whose job do you think it is to lead the way with these new technologies? Who should do what? Should energy companies compete and create new products that customers want, should third parties get involved, and / or should governments show the way? Explore

Final Reflections

3 mins

OK, that's all we wanted to cover tonight. Just a reminder that this research has been conducted on behalf of the Australian Energy Market Commission, which makes the rules for the market and advises the government.

TIME PERMITTING: If the Commissioner was actually here in the room with us, what would you say to him about what we've discussed?

Thank, pay (ask participants to check it's the right amount - \$100 residential / \$150 businesses) and close.

APPENDIX 3B: ONLINE COMMUNITY DISCUSSION GUIDE

AEMC 2016 Retail Competition Review (NGR 1509005)

Online Community Discussion Guide – Emerging Technologies

March 2016 – FINAL



LANDING PAGE

PROGRAMMING: Co-brand with Newgate and AEMC logos.

Hello [name] and welcome to the online community!

A big thank you for participating. Newgate Research is running this very important research to understand your views on issues to do with electricity and gas.

We're doing these sessions for the Australian Energy Market Commission (or the AEMC for short), who are the people that make the rules on how the energy market in Australia operates. They also advise state and federal governments to help them make decisions on energy policy.

Basically, the AEMC wants to know what the industry needs to do to make sure the needs of energy consumers such as yourselves are being met – both now and in the future.

This community will comprise around 20 people from across Australia. This means you are effectively speaking for people like you. If you have a certain view then it is likely that others do too, so please be open and honest in telling us what you really think.

Information you share will remain strictly anonymous – you can read more about your privacy below.

Before we kick off, it's really important that you read the 'housekeeping' information below so you know what to expect.

How it works:

Days 1 and 2

- On the first two days, we'll email you in the morning with new discussion topics. You just need to work your way through each day's discussion topics, which should take you only around 20 to 30 minutes to complete, but if you'd like to spend more time on it that would be great. Also, look out for spot 'bonuses' where you could earn extra cash for great responses and insights that are new, imaginative and well thought-out. We will let you know which ones are bonus questions as they come up.
- Try and log in at least twice a day: once to complete your answers and then later on to:
 - see if we've asked you questions about your responses so we can really understand your views, needs and ideas; and
 - respond to what others in the community have said.
- You'll be able to see other peoples' responses to a question once you've answered it yourself – this is to let us know what you think first without being influenced by what others have to say. 8)
- There's also 'poll questions' – make sure you hit 'Vote' at the bottom of each one to cast your response and then you'll see how others have responded.
- If there's any parts of your responses you really don't want other participants to see, just let us know – we can make responses totally private.

NGR 1509005 AEMC Retail Competition Review
Online Community Discussion Guide - ET

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- You can respond in various ways – writing into the response box (where you can also use emoticons, paste links to information online or YouTube URLs etc.), uploading images or files (you just need to give each file you upload a label / name for this to work), or recording video comments (click on the Record icon and work through each of the icons to record and finally save your video) etc:

- Once you've commented you can scroll down to see any posts from other participants. Then, when you're ready, click onto the next topic.
- And remember, we need you to participate in all activities on both of the first two days to receive your minimum \$80 thank you payment.

Day 3: Live Discussion Group

- On the third day, we will be running a live discussion at:
 - 7:30pm Australian Eastern Daylight Saving Time (NSW, ACT, Victoria and Tasmania)
 - 6:30pm in Queensland; and
 - 7pm in South Australia
- You will receive an email on that day, and you will need to register to receive your specific login details, then you can log in at the time of the discussion.
- The discussion will run for around one hour, and if you complete this chat you'll receive an additional \$40 for your time (i.e. \$120 for your full participation plus any bonus prizes you earn).
- This session will run like a normal live chat where everyone can see what everyone else is saying and 'talk live'. It will really bring together everything we've discussed in the first two days and we think you'll get a lot out of it.

Making the most of the community:

For everyone to get the best out of this experience, please do chat with each other and comment on each other's posts. As we've said, we've deliberately invited a mix of different people from across Australia, so we're expecting a range of opinions on the discussion topics. As we can't see you face-to-face or observe any nodding heads, writing your responses to other people's posts and 'liking' their posts will help us to get a sense whether others agree with certain points that have been said or whether there are different views.

And remember: there are no right or wrong answers here. No idea is a bad idea, or too big or small! We value **all** your ideas and comments.

NGR 1509005 AEMC Retail Competition Review
Online Community Discussion Guide - ET

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APPENDIX 3B: ONLINE COMMUNITY DISCUSSION GUIDE *CONT'D*

Who to contact:

If you have any questions please don't hesitate to contact your facilitator Jasmine Hoye via this platform. If you have any technical difficulties please email us at [katherine.rich@newqateresearch.com.au / philip.pantalas@newqateresearch.com.au]

Your privacy:

It is important to remember that this forum is being conducted confidentially. This means your comments are effectively anonymous as we do not give our clients the full names of the people participating. A few people from the AEMC may log in from time to time to see how the conversation is progressing but they will not be able to see any of your personal details or interact with you at all.

Newgate Research is bound by strict privacy rules within the Codes of Practice of the Australian Social and Market Research Society (AMSRS). To view our privacy statement go to <http://www.newgatecomms.com.au/research/newgate-research-privacy-policy/>

DAY 1

Day 1 - Introductions

To start off with, we'd like you to briefly introduce yourself. Here are the things we'd like you to share in the response box below:

1. Where you live: i.e. your city/suburb, town or regional location, and what state (there are people from all over Australia on here with us).
2. What do you do during the day (if you work, what type of work and industry)?
3. What type of dwelling do you live in – e.g. a house, townhouse/terrace, apartment, bungalow etc.?
4. Do you rent or own (mortgage or own outright)?
5. Who lives in your home with you, if anyone (if you have children, what are their ages)?
6. Which energy company are you with for **electricity** and for **gas** (if you have mains gas connected to your home)?
7. Would you say your household's energy use is low, medium or high?
8. Do you have solar panels, special meters or any other special energy technologies in your home?

[RESPONSE BOX] Please number your responses in the comment box as per the questions above so we can easily follow along.

Day 1 - Your Interest in Energy Issues

QUICK POLL QUESTION #1

First, let's start with a quick question: Relative to everything else in your life, how *interested* would you say you are in issues to do with energy, particularly electricity and gas? Please click on your response below – be honest, and then tell us a bit more about your response: i.e. if you are interested, tell us why? And if you're not interested, why not? SR

- Very interested
- Somewhat interested
- Neither interested nor disinterested
- Somewhat disinterested
- Not at all interested

[RESPONSE BOX] Tell us more about your level of interest in energy issues

Day 1 - What are the Issues in Energy?

What do you think are the big issues and challenges that Australia is facing in terms of producing, delivering and using electricity and gas services? What is the industry dealing with? Consumers? The Government?

What are you talking about at home, at work, or with friends? What have you seen / heard about in the media - mainstream, online, social media etc.?

[RESPONSE BOX]

Once you've responded, make sure you check what others are talking about: share your thoughts with them or 'like' the ones you agree with as major issues for the country.

Day 1 - New and Upcoming Energy Technologies and Services

Without doing *any* research (we know you'll be tempted!) and totally off the top of your head, what are all of the different types of energy innovations you've heard about – if anything (if you can't think of anything at all, that's *perfectly* fine).

Tell us about the new technologies or services you've heard of in terms of electricity services for households and businesses ... whether they're new or even just *new-ish*, not yet widely available, or *might* be coming in the future? These could be physical technologies, or *services* that different sorts of companies might offer or be thinking about offering. These could be types of hardware, or software, or even new services or businesses that might be springing up to take advantage of new technologies or approaches to addressing the challenges with supplying energy to homes and businesses.

Nothing is too big or too small or too 'out there' here – *if you've heard of it, tell us about it*. Write about it, post images, videos, links etc. Don't worry about getting the names of things right – whatever you can recall is perfect.

For each of the different things you've heard of, tell us what you know about it, what you think of it, *how* much of an impact you think it will have on *how* people use and buy/sell energy, how you think it will make a difference or help people etc.

But remember, it has to be something you *already knew about*.

[RESPONSE BOX]

Once you've finished, check out what others have shared and let us know if you've also heard of these, and which ones you're interested in knowing more about.

Then go through to our bonus activity for the day.

APPENDIX 3B: ONLINE COMMUNITY DISCUSSION GUIDE *CONT'D*

Day 1 - BONUS – New Energy Technologies and Services Images



Now here's one of those bonus tasks we mentioned earlier, and the last task for today.

For a bonus \$20 for the contribution that is most 'liked' by other participants and/or has the most merit, we'd like you to find a picture or two for us.

Please find a picture, video or some other form of post that best reflects your ideas about **new electricity-related technologies and services** which could improve experiences for consumers or help to address the challenges involved in delivering electricity to **homes and businesses**.

Once you've uploaded, please share your thoughts and feelings about why you chose these image/s.

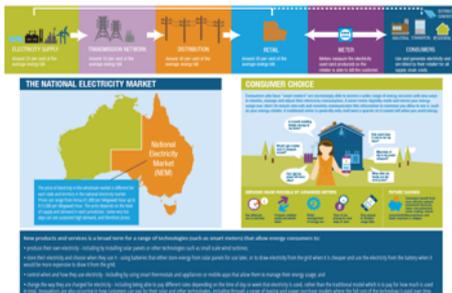
[IMAGE UPLOAD BOX AND RESPONSE BOX]

Once you've responded, please check back to see what everyone else has posted. Comment (e.g. if you have similar or different ideas or feelings) and 'like' your favourite/s or those you think are the best responses.

Closing for Day 1

Tomorrow we are going to focus more on new energy technologies and services, and how they might be used now and in the future!

We hope you've enjoyed what we've discussed today. Here's an overview of how the electricity grid works, what the National Energy Market (the NEM) is and some of the choices available to consumers – have a read! We'll go into more detail about these ideas in the session tomorrow.



Remember to check back later to see if we have posted any follow-up questions for you. And make sure you check out what others have been saying – feel free to give them a 'like' to show you agree and post comments.

DAY 2

Welcome back [name]! We hope you enjoyed yesterday, and have managed to spend some time chatting with your fellow community members.

Today we're going to focus on new energy technologies, plus new services which might be available because of these technologies.

Day 2 - New electricity technologies and services – doing some research

Your first exercise today is to spend 15 or so minutes doing your own research!

We'd like you to look around online to see what you can find about new and upcoming electricity-related technologies – hardware, software, new services or businesses that might be springing up to address the issues and challenges associated with delivering electricity to homes and businesses... e.g. helping consumers to manage their energy use, to store and/or produce their own energy, selling energy back to the grid, creating new energy grids, etc.

See what you can find out there and **report back to us on what you find** (show us links, images, ideas, post a video you've found or your own video etc) – **and tell us what you think of it all!**

- What's most interesting and exciting to you?
- What do you think is going to really take off and help solve a lot of problems or perhaps even cause new problems, and what you think is out there as an idea that probably won't really take off, is a bit 'flash in the pan', silly or marginal etc.
- What's confusing or hard to understand?
- Does any of it scare or worry you?

If you get stuck, let us know, we can give you plenty of ideas and links for things to check out.

[RESPONSE BOX]

MODERATORS: As needed if participants are struggling, suggest example prompts as follows:

- Ad for the Nest thermostat system: <https://nest.com/ie/thermostat/meet-nest-thermostat/#meet-the-nest-learning-thermostat>
- Home energy management app CSIRO has developed (1 minute 43): <http://www.csiro.au/en/News/News-releases/2015/Taking-remote-control-of-your-electricity>
- British Gas Smarter Living YouTube advert - <https://www.youtube.com/watch?v=pWqR6-la5dI>
- 4 Corners episode from a couple of years ago (at least from 23 - 24mins and 30 - 32.30mins, possibly also 36 - 38.5 mins): <http://www.abc.net.au/4corners/stories/2014/07/07/4038488.htm>
-
-
- Recent Catalyst episode re batteries: <http://www.abc.net.au/catalyst/stories/4398364.htm>

[Moderators to also probe on benefits and downsides, what interests them and why, whether they know any who has any of the things they've mentioned etc.]

Day 2 - Going off-grid or staying on-grid?

In your research you may have come across the idea of consumers disconnecting from the electricity grid and being self-sufficient in producing and using their own energy, versus staying on the grid and using and/or selling some of the energy they produce back into the electricity grid.

- What do you think about the idea of people disconnecting from the electricity grid? Does it appeal to you?

APPENDIX 3B: ONLINE COMMUNITY DISCUSSION GUIDE *CONT'D*

- How likely is it that you will disconnect from the grid in future? What makes you feel that way?
- Do you think many other people will be interested in disconnecting? Who? Why?

[RESPONSE BOX]

QUICK POLL QUESTION #2

In five years' time do you think you'll be connected to the electricity grid or not?

- Yes, I will be connected to the electricity grid AND most likely producing my own electricity (e.g. with solar panels)
- Yes, I will be connected to the electricity grid but I probably won't be producing my own electricity
- No, I will not be connected to the electricity grid – I will be producing my own electricity and not have the grid even as a 'back-up'
- I really don't know

Day 2 - New technologies and services in your home or business

Here's a list of some technologies and services which are already available or 'up and coming':

1. Solar panels – connected to the electricity grid
2. Batteries for storing energy that is produced either on-site (e.g. from solar panels, micro-wind turbines or other forms of generation) or drawn from the electricity grid – i.e. connected to the electricity grid
3. Solar panels and storage batteries that are not connected to the electricity grid
4. A Solar Power Purchase Agreement (PPA) – a long term contract to buy electricity from a solar panel system installed at your premises, which the energy company owns and maintains. The customer can purchase the solar power for an agreed price and period (usually below what an electricity retailer would charge), and gets the benefit of available feed-in tariffs on any electricity they don't use going back to the grid
5. A smart / interval / digital meter to help you understand and manage your electricity use
6. An energy management system which automatically controls your heating or cooling thermostat and appliances according to your settings
7. An app that allows you to remotely control / adjust your appliances (e.g. heating / cooling, washing machines) via your mobile phone
8. Giving your energy company permission to remotely adjust your appliances to help reduce energy demand peaks and keep prices down (e.g. temperatures up/down, switch on/off)
9. Going on to a "Time of Use" tariff, which has three or more different rates for different times of the day – e.g. peak, off-peak and 'shoulder' (in-between) rates
10. Other?

What we'd like you to do is in two parts:

- 1) Pick the **two** technologies or services which you think you would be **most** likely to buy or use in the next 5 years, write them in the box below, then tell us about why you think you would be likely to use them; then
- 2) Pick the **two** technologies or services that you think you would be **least** likely to buy or use in the next 5 years, write them in the box below, then tell us about why you think you would be unlikely to use them.

If there's a new technology or service you've come across in your travels that isn't in the list but you think you're really likely to buy or use in the next 5 years, please mention it here.

[RESPONSE BOX]

[Moderator probes: motivations and barriers: ladder to what is important about that to them (as much as possible). Cost: where cost is a factor in not using something – ask what they think it might cost, and what it would have to come down to, to make them consider it. Ask about leasing and the potential appeal of those sorts of arrangements.]

Day 2 - What could go wrong?! + BONUS \$\$ Opportunity!

Thinking about all of the ideas, technologies and services we've discussed in the last couple of days, what are the sorts of the things **you would worry could GO WRONG with them?**

Please be very specific about the different technologies and services you're thinking of so we can understand your specific concerns about what could go wrong (if you're not specific, we'll ask you!), and feel free to look back over previous topics.

We're asking about this because we need to try and understand how consumers feel about new or upcoming energy technologies and services, which will give us more insight into the consumer protections that may be appropriate for those technologies and services.

There's a **\$20 BONUS** up for grabs here too – if you come up with the most concerning or important thing that consumers should be protected against, you will receive an additional \$20.



To help us work out who gets the bonus, once you've responded, please check back to see what everyone else has posted and 'like' the one you think is the best response – feel free to comment on any other posts as well (e.g. if you have similar or different ideas or feelings).

[RESPONSE BOX]

Closing for Day 2

Thanks again for all of your input so far! We're very much looking forward to our live discussion tomorrow.

In preparation for our discussion tomorrow, it would be great if you could have a look at a few of these videos:

- British Gas Smarter Living YouTube ad - <https://www.youtube.com/watch?v=pWqR6-Ja5dl>
- Ad for the Nest thermostat system: <https://nest.com/ie/thermostat/meet-nest-thermostat#meet-the-nest-learning-thermostat>
- Home energy management app CSIRO that has developed: <http://www.csiro.au/en/News/News-releases/2015/Taking-remote-control-of-your-electricity>
- Recent Catalyst episode on storage batteries: <http://www.abc.net.au/catalyst/stories/4398364.htm>
- 4 Corners episode from a couple of years ago (the key bits to watch are from 23 – 24 minutes into the video and 30 - 32.30 mins, and 36 – 38.5 mins): <http://www.abc.net.au/4corners/stories/2014/07/07/4038468.htm>

Remember, you need to register for this discussion by clicking on the link we email you and entering your details.

The discussion starts at:

- 7:30pm in NSW, the ACT, Tasmania and Victoria;
- 6:30pm for our Queenslanders; and
- 7:00pm for those in South Australia.

APPENDIX 3C: ONLINE COMMUNITY LIVE CHAT GUIDE

| Section | Type | Content |
|---------|--------|--|
| 1 | TOPIC | Hi everyone and thanks for joining us tonight! We've really been looking forward to this and hope you are too. |
| | PROMPT | Just a couple of things to kick us off: Remember this is a chat and not a formal discussion, so please don't worry about your spelling, just get your ideas out to us. We'll know what you mean. :) |
| | PROMPT | If you're worried about your typing speed and keeping up with the conversation – don't be. We'll give you time to respond, and we'll be able to read your responses later. |
| | PROMPT | As you know, we don't need you to be an expert and we also don't need you to all agree, so if you feel differently from the group let us know ... and why. |
| | PROMPT | And remember that this community is confidential and we don't link anything back to you personally. We have some very strict privacy laws that we have to abide by. |
| | PROMPT | Just a heads up - things are going to move VERY quickly for the next hour!! Do your best to focus on responding to the questions - don't worry too much if you can't keep up with what others are saying. |
| | PROMPT | Does that all make sense? Any questions? |
| 2a | TOPIC | Over the last couple of days, we've looked at a host of new and emerging electricity technologies AND services which are starting to become available. Which ones really stood out for you? |
| | PROMPT | What made that stand out? |
| 2b | TOPIC | What might prompt you to seriously look at getting or using these - or indeed what might stop you? |
| 3 | TOPIC | Let's now imagine how consumers will be using different energy technologies, companies and services in 5 years' time. What will be different from today? Will consumers be interacting with different types of companies providing electricity services? |
| | PROMPT | What sorts of technologies and services will they be using to manage their energy use and keep their bills down? |
| 4a | TOPIC | Having reflected on the discussion from yesterday, how do you think the electricity grid will be different in 5 years (if at all) – e.g. will many people have disconnected from the grid? Will there be more small electricity networks that just service, say, a street or a suburb? |
| 4b | TOPIC | Do you think many households or small businesses will be producing or storing their own electricity - and then selling it back to others? Do you see yourself doing this? Why / why not? |
| 4c | TOPIC | Why do you think these changes will happen? What will prompt or trigger them? |
| 5 | TOPIC | OK, let's jump back in the time machine and travel 20 years into the future – imagine it's now 2036... What energy technologies, services and companies do you see consumers using? Be as creative as you like. :) To help you think about how much things can change, reflect on what it was like 20 years ago when hardly anyone had a mobile phone, and how much has changed since then. Will the scale of change be as immense in the energy space? |
| 6 | TOPIC | Did you watch any of the videos we sent you links to? Do you think any of the predictions in them will have come true and be used by most people in 20 years? How about in 5 years? What completely new electricity technologies or services or companies can you imagine that might have been created by then? |
| | PROMPT | Thanks for that everyone! Because we're having such a good discussion, we're going to stay in the future, but let's come back to 5 years from now – back to the future 8) in 2021... |
| 7a | TOPIC | Reflecting on new ways consumers might be using electricity technologies, companies and services in the future – do you think these things are just like buying a new TV or microwave where there are general protections for consumers, or do these things require special consideration because it's electricity? |

APPENDIX 3C: ONLINE COMMUNITY LIVE CHAT GUIDE *CONT'D*

| Section | Type | Content |
|---------|--------|--|
| 7b | TOPIC | So thinking about the sorts of things that could go wrong... Do you think the government needs to get involved or is it up to the energy technology and service companies to do the right thing by consumers? Should the government do anything new and specific to electricity to protect consumers? If so, what? |
| | PROMPT | Should any other third parties get involved? Who? How? Why? |
| 7c | TOPIC | Do you think there might be any issues with consumers understanding the information that about these new technologies and services? Should there be any special laws or rules about information clarity to protect consumers? |
| | PROMPT | OK, we're going to fire some scenarios at you to better understand your thoughts on this topic... |
| 7d | TOPIC | Imagine you've bought a new battery storage system and it's been installed for a week, but it isn't charging. What protections should be in place to ensure you get the right outcome? Does there need to be some special laws or regulations? Or do you think current consumer laws are probably enough to sort this out? |
| 7e | TOPIC | What about someone who has gone entirely off-grid - they're totally self-sufficient with their electricity: they have a small wind turbine and storage batteries, and a back-up generator. But something's gone wrong and they can't get their system working. Should they be entitled to any special new protections? If so, what sort? If not – tell us more. |
| 7f | TOPIC | Imagine you've had solar panels for 10 years and they've stopped working two days after the warranty expires. Again – what would you expect or want to have in place to protect you? Does there need to be anything new in place, or just the standard consumer protections? |
| 7g | TOPIC | Imagine you've signed an agreement with your energy company to let them remotely adjust your air-con by 2-3 degrees on extremely hot days to reduce demand, help keep prices low and avoid blackouts - and they give you \$10 off your bill as a reward each time. But what if they can't make the change they promised and there's a blackout, or what if they adjust the thermostat by more than you've agreed? Would you expect the government to get involved, or would you rather deal with the company directly? |
| 7h | TOPIC | What if you had a home energy management app and suspected there may have been a security or privacy breach ... do you think there might need to be some kind of new protections for consumers using these – if, for example, there might be a risk of someone hacking the app? Or are the current protections ok? |
| | PROMPT | Ok great, thanks for those responses. Let's think a bit more about the idea of people going off the grid. |
| 8a | TOPIC | What if that idea really took off in the future, and a whole lot of people went off the grid - what do you think the impact might be, and importantly: how should those impacts be managed? |
| 8b | TOPIC | Who do you think would be most likely to be 'left on the grid'? What would happen to those people? If they're the people who can least afford new technologies, and the price of staying on the grid goes up, how do you think these consumers should be helped – if at all? Who do you think should take responsibility for that? |
| 8c | TOPIC | Apart from ongoing running and maintenance of the electricity grid, it cost a lot of money to build, and these costs still need to be paid off in some form or another for years to come. Who should pay for that, and the upkeep of the grid? Or is this a scenario that isn't at all likely to happen because most people will stay on the grid, even though they might be interacting with or using it in very different ways from today? |
| | PROMPT | What do you think will be the fairest way for the grid to be paid for into the future? |
| 9 | TOPIC | Reflect for a moment on all of the changes to how consumers will be using electricity technologies, companies and services in the future. Which of the coming changes do you think are the biggest or most important ones that the government should be focusing on and preparing for now? |
| 10 | TOPIC | Thanks so much everyone for your considered responses tonight and over the past 2 days! We hope you've enjoyed this experience as much as we have. Please visit the discussion forums again later tonight or tomorrow for some final information, including how you will be paid for your time. We'll leave the forums open over the next couple of days in case you want to keep talking – it will close on Friday 11 March at midnight. |

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