Energy user paradigm: Workshop 1, outcomes of the day

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Prepared by ACOSS and TEC

Contents

1. Introduction

The Australian Council of Social Services (ACOSS) and the Total Environment Centre (TEC) in partnership with the Australian Renewable Energy Agency (ARENA), the Australian Energy Market Commission (AEMC) and Energy Consumers Australia (ECA), are working under the Distributed Energy Integration Program (DEIP) to deliver three workshops on the theme of energy user centred distributed energy resource (DER) network access and pricing. The intent of the three workshops is to develop a holistic suite of equitable and efficient network access and pricing solutions, underpinned by clearly defined energy user-centric design principles that has broad support, and can inform policy and regulatory changes. The workshops are a key part of a broader work program on network access and pricing being led by ARENA and AEMC.

The first workshop was held on the 5th of September 2019. It brought together 49 energy user groups, energy companies, energy market bodies and key stakeholders to begin the process of developing a new energy user centred vision and principles to guide energy reform processes in a higher DER energy system, including network access and pricing solutions.

The following provides an overview of the workshop purpose and agenda, key content discussed, draft of agreed high level principles and next steps.[1]

The workshop partners would like to thank all the participants for their time and contribution and look forward to ongoing engagement to finalise a new energy user vision and principles.

2. Workshop overview

The workshop was held in Sydney and facilitated by Trina Skidmore from Innerchoices.

The purpose of the workshop was to initiate the development of a new energy user centred vision and principles to guide energy reform processes in a higher DER energy system.

The key objectives for the day were to:

- Explore the needs and challenges of energy end users in a high DER energy system
- Provide an opportunity for discussion and understanding of different perspectives
- Develop a high level draft set of user centred design principles to guide policy and regulatory reform in a higher DER energy system
- To commit to a new paradigm of energy user centric thinking

There were forty nine participants (see appendix A). Participants worked in groups around six tables though-out the day. The groups change membership between the morning and afternoon sessions.

The workshop followed roughly the following agenda:

- Welcome and introductions
- Understanding the problem we are solving for and why it is important
- Knowing our vision
- Understanding what consumers want and the challenges meeting these needs
- Developing and agreeing the high level design principles which will guide policy reform
- Principles in action - exploring what these principles would mean when enacted
- Wrap up andnext steps

[1] Thank you to Caitlin Spears from ARENA for well summarised notes of the day.

3. Understanding the problem we are solving for and why it is important

Presentations were given by ACOSS, TEC and ECA to set the scene for the day, to assist in better understand the problem we are solving for, why this is important and what is trying to be achieved.

3.1. Changing energy market and why we need a new energy user paradigm

Kellie Caught, Senior Advisor Climate and Energy at ACOSS, spoke on the changes to the energy market to a two way more decentralised, distributed system, changes to energy user typology, the opportunities and challenges that a high DER energy system provides, and the need for energy user principles to guide future energy market reform. A briefing note can be found in appendix B. Key points included:

- Changes in technology and the shift to more distributed energy resources (DER) such as rooftop solar, batteries and electric vehicles, is changing how people can engage with energy, the energy market, and other energy participants.
- The inevitable growth in DER in Australia presents huge opportunities, providing energy users with more agency, improving efficiencies and reliability, and cheaper energy for all.
- But there are also challenges. Market structures, regulations and network operations do not enable the benefits of DER to be maximised. High DER exports are creating technical issues for networks, causing them to restrict exports and/or increase costs. There are inadequate customer protections for emerging products and services. And there are major equity issues…
- There are millions of people who are currently locked out of DER, especially people on low incomes who already pay significantly more of their income on energy bills, contribute disproportionately to some DER subsidies and system costs, but either cannot afford or do not have access to energy solutions.
- To ensure the new energy system is equitable and the benefits are maximised for all customers will require new technologies, business models, policies, regulatory and market reforms, and will need the energy industry to engage differently with energy users.
- A new energy user paradigm, defined by a set of principles, is needed to guide the reforms of a high DER energy system. The focus just on affordability, reliability and security is no longer fit for purpose and principles that consider the public good, equity, agency, sustainability, and causer or user pays must be considered.

3.2. Language matters

Mark Byrne from the Total Environment Centre (TEC) spoke briefly on the importance of language, based on his recent article *Goodbye energy consumers, hello energy citizen*, in Renew Economy (see appendix C). Key points included:

- Words have power - the way we talk about things influences how we think about things (and vice versa)
- Can't continue to view people as 'consumers' (implies passive consumption)
- Alternatives include 'prosumers', 'consumers' - still very technology-focused
- 'End users' cover the range from consumers to prosumers to energy citizens (the last forces us to reframe people in a political sense; they have agency and control)

Mark also reminded us that we need to consider electricity as a public good and the need to view the problem and solution through the lens of equity and human rights (rights to access and sharing).

3.3. Consumer principles –how to frame them

Chris Alexander, Communications Director at Energy Consumers Australia (ECA), talked about what their consumer research is telling them and why the shift towards consumer centric thinking in principles is critical:

- Consumers are reporting that energy is no longer affordable, and that the sector is not working in the interest of consumers; feeling lack of agency and control.
- Thinking behind what guides the sector is changing - originally engineering and economics, now there's a shift towards consumer-centric thinking; we need to organise *how* we think about consumers, how we can *guide* the thinking of the market operators, network designers, technology innovators, regulatory reformers, etc.
- The principles we need to agree upon must go beyond the fundamentals of efficiency, reliability, affordability, security, etc. Must also consider agility, insurance (i.e. safety nets for anyone who slips through the net), free-riding, consumers - see former UK Business Secretary Greg Clark's recent speech on the future of the energy market.

Chris provided some examples of where principles are being developed, including:

- The UK Energy Research Centre which developed a set of values and principles pertaining to energy systems change based on public research (see appendix x). A key finding of the report is the public want transparent reciprocity – the public will change their behaviours and attitudes *if* government, regulators and businesses will also change theirs in a transparent manner.
- Hawaiian Public Utilities Commission guiding principles, for a grid modernization strategy, that puts the consumer front-of-mind (see extract in appendix D).
- The DER enabling group, under the National Consumer Roundtable on Energy, has prepared draft principles to guide DER growth in an equitable way (see summary in appendix D).
- Monash/RMIT research on Engaging Households Towards the Future Grid developed principles to guide engagement towards the future grid.

3.4. Question and Answer

Below is a few reflections and comments from workshop participants after the presentations:

- The CSIRO Electricity Network Transformation Roadmap is worth reading as it touches on some of these issues.
- The keyword from the Hawaiian PUC's guiding principles was *balance* of competing and complex interests (economic, regulatory, technical, environmental, cultural considerations).
- In a catastrophic future climate event, autonomy may not be as important as what we're currently considering.
- *Access* is important.
- ECA asks consumers individually *what* do they want and *what* do they do (see Power Shift research and surveys), and are now beginning to investigate the *why* and *how* (understanding consumer values). The Power Shift findings are very consistent with those coming out of the UK.
- All consumers face challenges and barriers, but it's the lowest-income consumers that face the most hardship so we need to really consider those people (i.e. how can we focus the principles on helping these people).
- We don't want more reviews and surveys and studies; we want to build a foundation for real reform and implementation. No more utopian thinking, let's be practical and build on the work we've already done
- This is a change process, not just the what/where we want to be. Change is already happening via the path of least resistance and loudest voices. Change always contains risk (winners and losers) so we need to consider all perspectives.
- It's right to frame principles around those most at risk. Reciprocity is they key - what is the cost of a social compact for everyone and how do we build system that nudges people towards the collective good.

4. What's our vision

Rather than explicitly develop a vision statement, workshop participants were asked to work with their fellow table members to draw a vision and then describe its key elements back to the whole group. The purpose of this exercise was to get participants to start thinking creatively and outside the box, while identifying key elements that could underpin a shared vision.

The vision drawings for each group can be found in appendix E. A summary of key concepts describing the vision follows:

- Enabling, empowerment, engagement
- Access to DER benefits; balancing of benefits
- Nobody is left behind; all in this together; community, inclusiveness; multiple interests working together for the overall good
- Fairness
- Sustainability and self-sufficiency
- Resilience, support
- Interconnectedness of relationships, benefits, costs
- Systemic, holistic approach
- Roles are constantly changing

ACOSS and TEC will consult further to develop a shared vision statement to support the values and principles.

5. Understanding what energy users need and want

Below is a summary of the key concepts and discussion that came out of the sessions on looking at what energy users need and want. Photos of each groups work can be found in appendix F.

- Essential service: reliable, secure, safe, affordable
- Access: to DER benefits and to technology (noting benefits need to be defined)
- Empowerment (noting this requires literacy and informed decision making)
- Choice: power of choice, choice to engage or remain passive
- Control, autonomy, agency
- Only pay for the services they need/want/use
- Simplicity: automation, things work as expected
- Trust: in the system, in the technology, in the market bodies and other players
- Fairness, equity
- Community, peer-to-peer trading; research shows that consumers *do* want to contribute towards the bigger picture
- Respect, mutual understanding, acknowledging multiple and diverse consumer groups
- Transparency, certainty and predictability

6. What challenges do energy users face in having their needs and wants met and how do we overcome this?

Below is a summary of the key concepts and discussion that came out of the session exploring the challenges facing energy users and shifts in thinking required to overcome the challengers. Photos of each group's work can be found in appendix G.

6.1. Challenges

- Lack of policy direction
- Too many market bodies and organisations
- Large-scale, long term, systemic/architectural change
- We're only as good as our weakest link
- Acknowledging there will be winners and losers
- Unintended consequences (e.g. EV users stop paying road taxes, which are shifted to non-EV users)
- A traditional 'patriarchal' control-and-command system is shifting towards a decentralised and democratised system (whether we like it or not) - our role is to design the architecture so that all this happens in a manner that achieves our shared vision

6.2. How can we overcome these?

- Enable collaboration and transparency between parties with commercial interests - the platform we build is critical to enabling this
- Collaboration (e.g. DEIP) to bring together many organisations, find a consensus, speak as a united voice - provide a united front on rule changes to AEMC (removes the need for government policy direction)
    - Collective approach to problem solving and decision making
    - Co-design reform
- Focus on the future
    - Build from the current state AND the future state AND make sure both visions meet in the middle (Sydney Harbour Bridge analogy)
- Provide support to those 'left behind' (a discussion was had around the need to better define this term)
- Communicating change with the community - why, what, who, how, when and providing a united voice. We are all leaders in our respective communities (e.g. business, renewables, networks, consumers, etc.) - what can *we* do to lead this?

7. Developing and agreeing the high level design principles which will guide policy reform

7.1. Group work

Participants were asked to brainstorm the overriding guiding principles to consider when designing future reform. Below is a summary of the key concepts and discussions that came out of the sessions with photos of each groups work pasted in appendix G.

- Consultation and communication
    - Co-design with consumers (with the consumer advocates and representative bodies AND with communities directly via media, etc.) by engaging early, authentically and with an ongoing dialogue
    - 'We'll do it *with* you, not *to* you'
    - 'Pass the pub test' - must be communicable, understandable and accepted
    - Open source information

    - Our approach will remain clear, simple and understandable
    - People understand how this fits into the broader context
    - Diverse consumer voice is fundamental to all conversations
    - All voices (consumers/individuals, communities, business, industry, regulators and operators) are important and must be acknowledged
- Fairness and equity
    - To act in the long term interest of the community
    - Ensure everyone has access to DER benefits (whether you actively participate or not)
    - 'Choose your own adventure' - can choose to engage if they want to
    - Fair distribution of benefits and costs
    - Individual choice is not greater than the collective good (no harm done)
    - We design for fair outcomes for all consumers (there was conversation that defining what is "fair" can be frustrating, but ultimately it has to pass the pub test)
    - Shared responsibilities and accountability
    - Causer pays - whoever receives a benefit pays proportionately to receive that benefit
    - No one left behind (there was some discussion that some people may not benefit as much as others and it was important to have safety nets or complementary measures to address inequity)
- Risk management
    - Risk being managed by those who are best placed to manage it (Noting that we traditionally build costs into the systems in order to conservatively manage risk. In future will require honest and frank communication with the community and politicians)
        - Shared acceptance of uncertainty and risk - in order to remove inefficient and conservative costs
    - Better understanding the trade-offs
- Security and reliability
    - We will meet user needs safely and reliably
    - No one is left behind for essential access to energy
- Net environmental benefit
    - All new energy is clean energy
- Autonomy, empowerment and choice
    - Ability to choose to participate or not (whatever their preference is)
    - Provide a range of innovative and affordable options to move forwards
    - Consumption is not a choice for many people (e.g. parents can't choose when they use electricity)
- Protection
    - Consumer rights
    - Consumer choice
    - Access to affordable essential energy
    - Affordable energy for all to access
    - We'll put availability and affordability first

7.2. Consolidating the ideas for guiding principles

In the last session for the day, the facilitator led an all participants discussion to identify a set of guiding principles. Not surprisingly, there was much discussion and debate about the level of principle (guiding versus design) and an acknowledgement that some elements may be missing that were reflected in the group's brainstorms. There was agreement that more work would be needed to further refine and reflect the group work.

The draft guiding principles identified were:

1. Building a brighter, cleaner future
2. No-one is left behind
3. Do no harm
4. Shared stewardship
5. Fair distribution of costs and benefits
6. Meet people where they're at and giving them what they need
7. Balance values and interests
8. Fosters trust, confidence and predictability

Below is a table provided by our note taker that captures some of the discussion around the guiding principles.

Guiding Principles	**Design Principles**
Building a brighter, cleaner future	• All new energy is clean energy • No one is left behind, equity • Sustainable, future-thinking, acknowledging legacy issues • Climate resilience
Fair distribution of benefits and costs	• Costs and benefits are broader than economic
Do no harm	• Safety, security, reliability, resilience • Meet people where they are and give them what they need
Balance between competing and complex interests	• Economic, regulatory, environmental, technological/technical, and cultural considerations
Shared stewardship	• We're in this together, shared responsibility, equitable distribution of responsibility • We will do it *with* you, not *to* you, engagement, consultation
Fosters trust, confidence and predictability	• Simplicity, engagement, consultation • Meet people where they're at and giving them what they need

8. Next steps

As discussed above, more work will be needed to further refine the guiding principles and develop more detailed design principles. Fortunately the workshop produced high quality discussion and content that can be drawn on to complete the work required to develop a new energy user paradigm.

- A drafting group consisting of ACOSS, ECA and TEC will work through the workshop content and produce the first draft of a vision, guiding principles and design principles.

- A small advisory group made up of interested workshop participants will be established to assist refine the first draft.
- Forums will be held in mid-October in Melbourne, Sydney, Brisbane and via webinar to test and further refine the vision and principles with workshop participants.
- A final working version 1.0 of the vision and principles will be produced and circulated in November 2019.
- We envisage slight changes may be necessary as we further engage in a number of the energy reform process. We will aim to have a final version in early 2020.

For further information, please contact

Kellie Caught
Senior Adviser, Climate and Energy, ACOSS
E: kellie@acoss.org.au

and/or

Mark Byrne
Energy market advocate, Total Environment Centre
E: markb@tec.org.au

Appendix A – Workshop Participant list

Kellie Caught, ACOSS

Mark Henley, Uniting Communities

Chris Dodds, EWON

Steve Blume, Smart Energy Council

Scott Sandles, AER

Jill Cainey, ENA

Professor Neil Horrocks, UQ

Lynne Gallagher, ECA

Luke Reid, QCOSS

Phil Chan, AEF

Mark Paterson, Strategn

Caitlin Sears, ARENA

Anthony Bell, AEMC

Bernadette, TasCOSS

Brian Spak, CSIRO

Matt Garbutt, ESB

Phillip Watson, UTAS

Chris Alexander, ECA

Craig Memery, PIAC

Kristy Walters, Community Power Agency

Grant Stepa, Rheem

Ed Chan, AEMC

Chris Cormack, AEMO

Kenny Mizzi, Energy QLD

Gordon Bijen, Anglicare

Anna Livsey, PIAC

Simon Moore, NSW Business Council

James Seymour, C4net

Jordan Welsh, ARENA

Tim Benjamin, VIC

Kurt Winter, AGL

Dean Lombard, Renew

Gavin Dufty, St Vinnies

Yvonne Kwan, Salvation army

Kathy Rankin, NSW Farmers Fed

Con Kemenade, LO3

Jon Sibley, ARENA

Chris Marsden, SA

Lawrence Irlam, EA

Renate Egan, Solar Analytics

Mark Byrne, TEC

Douglas McCloskey, PIAC

Robyn Robinson, COTA

Lucy Darragh, Grain growers

Craig Chambers, ARENA

Mike Swanston, Consumer consultant

Sabiene Heindl, Energy Charter

Hedda Ranson-Cooper, ANU

Appendix B - DRAFT Briefing Note: A new energy user paradigm for Australia's energy system and services

Summary

Changes in technology and the shift to more distributed energy resources (DER) such as rooftop solar, batteries and electric vehicles (see Box 1 for more examples), is changing how people can engage with energy, the energy market, and other energy participants.

The inevitable growth in DER in Australia presents huge opportunities, providing energy users with more agency, improving efficiencies and reliability, and cheaper energy for all.

But there are also challenges. Market structures, regulations and network operations do not enable the benefits of DER to be maximised. DER exporting is creating technical issues for networks restricting exports and or increasing costs. There are inadequate customer protections for emerging products and services. And there are major equity issues

There are millions of people who are currently locked out of DER, especially people on low income who already pay significantly more of their income on energy bills, contribute disproportionately to DER subsidies and system costs, but either cannot afford or do not have access to energy solutions.

To ensure the new energy system is equitable and the benefits are maximised for all customers, will require new technologies, business models, policies, regulatory and market reforms, and will need the energy industry to engage differently with energy users.

A new energy user paradigm, defined by a set of principles, is needed to guide the reforms of a high DER energy system. The focus just on affordability, reliability and security is no longer fit for purpose and principles that consider the public good, equity, agency, user pays must be considered.

Box 1. Distributed Energy Resources (DER)

- Demand Management
- Energy Efficiency
- Solar PV
- Small scale Battery
- Electric Vehicle
- Virtual Power Plant (VPP)
- Peer to Peer trading
- Community renewables

Energy an Essential Service

Energy is an essential service. For business it is critical to economic outcomes. For people it is critical to health, social, and economic outcomes. Energy however is particularly fraught for the 3 million people living below the poverty line who pay disproportionately more for their income on energy (on average 6.4% up from 5.4% a decade ago) compared to households on the highest income quintile (who pay an average of 1.5% of income, up from 1.4% a decade ago).[2]

Those with the least suffer the most from unnecessary energy costs. Some families are forced to go without basic needs like heating, cooling and food, or don't send their kids on school excursions, just to pay the bills.

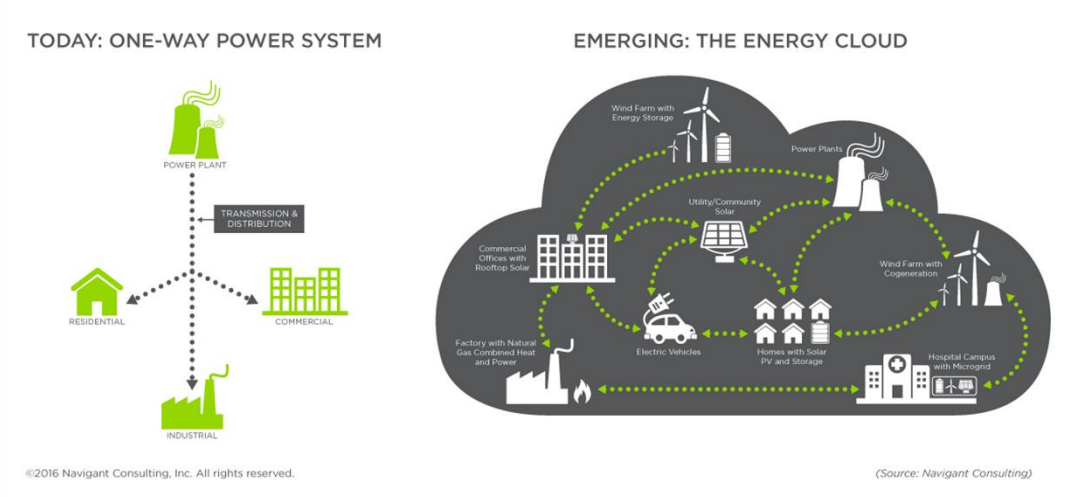
Ensuring energy is affordable, accessible and equitable is essential.

[2] ACOSS and BSL (2018) Energy Stressed in Australia. https://www.acoss.org.au/wp-content/uploads/2018/10/Energy-Stressed-in-Australia.pdf

Rapid change in the way energy is produced and delivered

The energy market is evolving rapidly, driven by technology change, preferences of some customers, and the need to transition to zero emissions energy.

The energy system has shifted from large scale, baseload, centralised energy distribution with passive consumers, to a mix of large and small scale, centralised and distributed, renewable and dispatchable energy, with a mix of active and passive energy users (see figure 1).



- Large, centrally located generation facilities
- Designed for one-way energy flow
- Utility controlled
- Technologically inflexible
- Simple market structures and transactions
- Highly regulated (rate base) and pass through

- Distributed energy resources
- Multiple inputs and users, supporting two-way energy flows
- Digitalization of the electric-mechanical infrastructure: smart grid and behind the meter energy management systems
- Flexible, dynamic, and resilient
- Complex market structures and transactions
- Regulation changing rapidly around renewables, distributed generation (solar, microgrid, storage), net metering etc.

Further, energy generation, transmission and retail that was once in public hands has increasingly been privatised. Including at the household level where households are no longer just consumers of energy but can generate, store and sell energy, and engage in demand management. For example, over 2 million homes already host rooftop solar and 80,000 have batteries.[3] Australia has the highest solar ownership in the world.[4]

CSIRO and Energy Networks Australia modelling suggests we could see almost half of our energy needs being met by rooftop solar and consumer-owned assets (including batteries and electric vehicles) within 20 years.[5]

New technology and services (see box 2) will change how energy users engage with energy, the market, and other energy participants, and enable greater uptake of distributive energy sources.

Box 2. Enablers of DER

- Digital advances (Block chain, Internet of Things)
- Social media
- Mobile connectivity
- Smart meter enabled
- Big data
- Technology advances
- Set and forget services
- Reduction in costs

[3] https://arena.gov.au/blog/darren-miller-the-energy-revolution-is-happening-in-our-homes/
[4] https://reneweconomy.com.au/nine-reasons-to-celebrate-solar-pv-in-2018-2018/
[5] Electricity Network Transformation Roadmap: Final Report', *Energy Networks Australia and CSIRO*, April, 2017, http://www.energynetworks.com.au/sites/default/files/entr_final_report_web.pdf

What does the energy user look like in the 21st century?

As outlined in Box 3, a new energy user typology is emerging, ranging from people and business who do not want to engage in DER right through to those who want to be able to generate and sell into the spot market.

While most people and businesses care about energy, not all actively engage in the energy system, either because they don't want to or because they experience barriers to actively engaging. Barriers include the type of home they live in, geography, renting, affordability, language, literacy, health, stress, complexity, lack of business models, network restrictions etc.

Motivations for wanting to engage in DER can also vary from bill savings to addressing the climate crisis.

For those that can and want to actively engage in the new energy system, how do we ensure their agency is maximised, that they are adequately rewarded for the benefits they provide the energy system and appropriately pay for the costs they impose on the energy system and other energy participants?

For those who don't want to or can't engage in DER, how do we ensure either the barriers are removed or minimised and/or they share in the benefits of DER and are not left behind?

Box 3. 21st century energy user typology

Energy User Typology

- Energy users with no DER:
  - Grid-connected with very limited interest in energy matters, just want reliable service.
  - Grid connected customer seeking best offer, service or value but not interested in managing energy
  - Grid connected attentive to energy consumption and management would like DER but there are barriers.
- Energy users with DER (possibly just solar) who are happy with passive controls such as fixed export limits.
- Energy users who are happy to have dynamic export limits (and/or the option of paying for high exports).
- Energy users who have some level of aggregated participation through, for example, remote control of appliances, solar, or batteries.
- Energy users who want to participate as active end users and bid into wholesale spot and FACS markets.

Motivations to access DER

- Not seeking DER:
  - Limited interest in energy matters just want reliable services (price may or may not matter).
  - But looking for best energy offers, service and value.
- Interested in DER:
  - But there are Barriers
  - Motivated by one or more of the following:
    - Environment/climate
    - Save money
    - Tech savvy early adopters
    - Low trust in energy companies
    - Improve reliability
  - No Barriers
  - Motivated by one or more of the following:
    - Environment/climate
    - Save money
    - Tech savvy early adopters
    - Low trust in energy companies
    - Improve reliability

DER creates benefits and opportunities

In the future, the CSIRO suggests that a well-planned shift to 100% renewable energy and a more distributed model will bring efficiency and costs reductions to the energy system and reduce energy bills for all households. The shift is modelled to provide greater efficiency in the system, reduce the need for significant investment in traditional poles and wires ($16 billion by 2050), improve reliability and security, pay customers for grid support, and save the average household $414 annually compared with a future based on business as usual. [6]

Box 4. DER: Opportunities and Benefits

- Providing people with more choice and control
- More affordable energy
- Healthier homes
- New energy markets and business
- Improve energy system efficiencies and reliability
- Faster emissions reductions.

To date rooftop solar has played an important role in reducing the energy bills of 2 million Australia households. New services such as demand management and products such as batteries, can reduce household's energy bills, for those who have access, even further.

Distributed energy resources (DER) such as rooftop solar, battery and demand management has reduced wholesale and in some cases network costs for all consumers, by reducing peak demand and need for investment in large scale generation. Further efficiencies can be achieved. In Western Australia investment in micro-grids is reducing the need for long-distance costly transmission lines.

DER has increased energy autonomy or independence for some people and communities. For example in regional and remote areas establishing micro-grids offers opportunity to reduce costs and improve reliability. In the case of community energy projects it can increase local social cohesion.

Virtual Power Plants (VPPs), can enable a third party to manage a range of distributed energy resources at the household level with other households as a collective to for example bid into the wholesale market. Or the emerging Decentralised Market Exchange create open marketplaces for distributed energy services to be generated, controlled or stored, and then traded between households, business, utilities and the larger market operators.

DER can provide voltage control services, or can be used to defer the need for network augmentation by locally supplying a growing load.

Large and small scale renewable energy, energy efficiency and demand management has and will continue to play a critical role in Australia's response to the climate crisis.

DER faces challenges and risks

Challenges are emerging around equity, inclusiveness, agency, and consumer protections. Some of the specific challenges follow.

Not everyone can access DER such as solar and batteries

While there may be a time in the future where more and more people will be able to access some DER products and services, at the moment there are millions of people and thousands of businesses who at the moment cannot access solar and batteries, or may be restricted in their use:

[6] Electricity Network Transformation Roadmap: Final Report', *Energy Networks Australia and CSIRO*, April, 2017, http://www.energynetworks.com.au/sites/default/files/entr_final_report_web.pdf

- There are 3 million people who live below the poverty line, who cannot afford to purchase solar, batteries or impactful energy efficiency measures.[7]
- Renters (people in private, public and community housing) cannot directly access solar/batteries and energy efficiency without landlord permission and where they can there are not always benefits to the renter. According to ABS at least 29% of households rent.
- People in apartments cannot directly access solar.[8] According to ABS at least 13% of households live in apartments.
- People in areas with high solar penetration me not be able to utilise solar or may be restricted from what they can export, because of the impact on network voltage.

Costs of the new energy system are not being distributed equitably

In some cases the costs of supporting the growth of DER are not being shared equitably, especially when these costs are recouped from energy bills where people on low-incomes pay disproportionality more of their income on energy.

- Solar subsidies have and in some cases continue to be recouped through energy bills of all households (LRET, SRES and some state government FiTs). The charges are applied *to each unit of energy consumed*, households with solar (who already benefit from FiT and SRES), typically contribute less. This is because solar households typically have lower energy bills due to less grid consumption. These schemes have provided broad benefits such as emissions reductions and downward pressure on wholesale prices, while avoiding new peak generation and job creation. However, allocating costs of these schemes through electricity bills is regressive.
- Solar households pay less network costs leaving non-solar households to pay more under flat tariffs and network revenue caps. Network charges are for the most part also applied *to each unit of energy consumed.* Note this problem is lessened under time of use and demand tariffs, but can be problematic for some households, especially vulnerable households, to manage.

Technical issues with two way flow

- Solar is causing voltage and thermal constraint issues on networks in some areas, affecting reliability and increasing costs to manage and reduce the issues. Most networks have limited size or export capacity of solar systems to manage the problems. The restrictions can be greater in regional/rural areas.
- Distributed energy is not currently visible to, and controllable by, AEMO, which could lead to system security and reliability issues until this is rectified.

[7] ACOSS (2018) Poverty in Australia 2018, https://www.acoss.org.au/wp-content/uploads/2018/10/ACOSS_Poverty-in-Australia-Report_Web-Final.pdf

[8] Noting that there are other opportunities for these households to invest in or buy energy from solar systems, including solar gardens.

Regulation, market structure and business models limiting customer agency

- Current regulation does not allow residential customers to easily engage in demand management (noting AEMC has put forward a wholesale demand response mechanism rule change to address this).
- Current regulation does not allow networks to charge solar-users to export to the network.
- Business models are not in place to adequately reward DER users for the benefits they provide the energy system and network. Such as network support (voltage control or to defer a need for network augmentation), services to AEMO (such as the emergency procurement services or system support), or peer to peer trading.[9]

There are fewer customer protections for households utilising distributed energy (behind the meter).

- Lack of consumer rights for distributed energy products
- Lack of consumer rights government business models of distributed energy
- Lack of clarity around data access and privacy

New energy user paradigm guided by principles is needed

The energy landscape is changing so rapidly it is hard to define one single future pathway or know with any certainty what the speed and scope of the transition will be. New technologies, business models, policies, regulatory and market reforms, and changes to how the energy industry engages with energy users (residential and business), will be needed.

There are multiple reform process underway the either are directly or indirectly looking at DER integration, including ENA and AEMOs Open Networks; COGATI; Integrated Systems Plan (ISP); AENA DEEIP; AEMCs Electricity Networks Economic Regulatory Frameworks Review; and ESB Future Market Structure.

There are concerns by many energy user groups that many of these reforms are technically focused and will not deal adequately with some issues like equity for example. Some of the solutions may have perverse outcomes if the needs or desires of all end user is not at the heart of developing the solutions.

Given the diverse way energy users want to engage in the energy system and some of the challenges growing DER engagement is already having, now more than ever we need to put the end user at the heart of policy and regulatory reform. However, the focus on customers as only a *passive consumers* and an energy system concerned only with price, quality, safety, reliability and security of supply (as defined in the National Electricity Objective NEO) is no longer fit for purpose to guide the reforms.

A new customer paradigm is needed to guide the reforms of a high DER energy system, defined by a set of principles, which considers issues such as equity, participation, agency, user pays, as well as affordability, quality, safety, reliability and security.

For comment please contact

Kellie Caught
Senior Adviser, Climate and Energy, ACOSS
E: kellie@acoss.org.au

[9] https://www.aemo.com.au/-/media/Files/Electricity/NEM/DER/2018/OEN-Final.pdf

Appendix C – Goodbye energy consumers, hello energy citizen

Mark Byrne is energy market advocate at the Total Environment Centre and the founder of the Local energy Facebook group.

Don't you just hate the idea of being a consumer?

A passive receptacle for all the goods and services that a capitalist economy pushes in your direction. Or an octopus-like feeder on whatever material goodies your tentacles can grab hold of to temporarily fill the emptiness within.

In the energy world, the idea of the consumer is only slightly better than that of the customer or end-user, who might not even be a human being but a business. The whole system is supposed to operate "in the long term interests of consumers".

But what if you don't want to be (just) a consumer?

In the brave new world of local energy (or distributed energy resources, DER) all that is changing. With the shift from a one-way to a two-way system, the passive (but economically rational) consumer is giving way to the ideal of the active prosumer or producer-consumer.

Even the idea of the prosumer is inadequate, though, as it does not capture the emerging context of energy storage and trading.

More importantly, it is a techie term that does not capture the social and political roles that we can play in an emerging energy system which will be increasingly dominated by local energy: not just solar, batteries and EVs but also energy efficiency, demand response, virtual power plants and microgrids.

What we're witnessing is akin to the political shift from feudal or totalitarian regimes to modern representative democracies.

Power is literally shifting to the people, and we have only just started to conceptualise what that might mean in metaphorical terms as well. It is not just about threats to the business model of the energy industry incumbents. It's about new forms of social organisation and decision-making.

Perhaps we now need to think of ourselves instead as energy *citizens*: actors (rather than consumers) with political power and legal rights in, but also moral responsibilities for, the new energy system. (This is not a new idea. There is a small but growing body of academic literature around energy citizenship.)

The implications are potentially wide-ranging.

For instance, we have come to think of electricity as an essential service, but we don't normally apply this concept beyond the right to access and consume it. Should the right to live in an efficient home and access energy generation, storage and trading also be considered an essential service?

Especially if these services are critical not only to the cost of living and wellbeing but also to the way we interact with our local communities?

Local storage, two-way flows and microgrids will become increasingly important contributors to system resilience in the face of accelerating climate change impacts and cyberattacks. Ergo, local energy may be considered an essential service.

Faced with a multitude of choices in a high DER world, the industry often complains that consumers don't want choice. They want simplicity, because energy is just a means to an end. But maybe that is because consumers have only been offered choices between fifty shades of powerlessness.

Recognise the power of the energy citizen and you give them a real stake in their world. Then see how much they care about energy. (A case in point: the likely stampede to electric cars when they are not only cost competitive but also offer vehicle-to-home discharge capability.)

On rights, the most basic is the right to be responsible for our own energy supply as well as demand.

Second, we might negotiate rights to export and trade energy, with limitations in view of competing domains for calls and wires, the needs of our fellow energy citizens, public policy imperatives and economic realities. Third, we should have the right to be rewarded for the private and public value of the services we provide.

And finally, we should have the right to an active role in grid management—a concept which is slowly gaining momentum with market bodies and the industry, but which is much easier to achieve the more the system is localised.

On the other hand, we should have the right *not* to be engaged energy citizens if all we want is a basic level of services. Creating opportunities for engagement is different to requiring it.

With rights come responsibilities. As energy citizens, we can't expect to profit where we provide services to the grid without also bearing the costs where we directly cause them. The regulatory regime was constructed around one-way flows; as it becomes bidirectional, we need to be open to new ways of cost- as well as benefit-sharing.

We also need to think about how to include those other energy citizens who may not own or control the resources themselves: renters, apartment dwellers, low income households.

Democracies are founded on the ideal of one person, one vote, irrespective of gender, income, etc. How do we ensure that our fellow energy citizens benefit equally from the transition?

Solar gardens and community scale batteries are two examples, but we also need better ways to ensure that everyone's voices are heard. Otherwise, some of our fellow energy citizens are likely to be unhappy at being left behind.

We should also be encouraged to share our energy rather than hoard it by disconnecting from the grid—a resource which may be mostly in private hands now, but which was built using public money and which still has considerable opportunities for the sharing of resources and services between haves and have-nots.

Finally, as the climate emergency unfolds, in order to maintain resilience the local energy system is likely to complement, rather than replace, the old centralised system of big power plants and long transmission lines.

As long as we get the right policy signals for rapid carbonisation, that is. The longer we have to wait, the more energy citizens are likely to take power into their own hands.

The choice is no longer between central control and individual choice; it is between democracy and anarchy.

End.

Appendix D – ECA: Why is this workshop necessary, important and timely?

For those of you who I haven't met, I'm Director of Advocacy and Communications at Energy Consumers Australia. We advocate for households and small businesses in energy policy and regulatory processes and engage directly with companies, drawing on what consumers tell us through our research and interactions with them.

What are they telling us?

They are telling us that energy services are not affordable, they are not Value for Money and they do not have confidence that the sector is working in their long-term interests. This is THE lens through which most people think about energy.

Clearly – the fact that the price of energy has for many essentially doubled in the past 10-15 years, with extraordinary price spikes along the way – is a root cause of the dissatisfaction we see coming through our research.

But it is also about a feeling of a lack of agency and control in the face of rising price.

Across the country people are asking themselves what can I do not just to get a better price, but how can I manage my use to keep my bills down?

For many this means door snakes, it means bubble wrap on single-glazed windows, it means switching off microwaves at the socket to save on standby power. It means painting the roof of their house white to reflect heat and ease the load on air-conditioners that are expensive to run.

And for an increasing number of Australians – more than 2 million now – it also means generating and storing their own power.

We equate this to the fans jumping the fence at the MCG to join the game.

This mass migration – driven by necessity and enabled by new technology – has already fundamentally changed the energy system and the energy market.

From a system of a 'small number of large things', to a 'large number of small things'.

From a market big engineering and orthodox economics were enough, to one where there is an incredible new social dimension.

And at the same time as there is a need to decarbonise the system.

But here is the problem.

<u>We have not defined – from the consumers-user-community perspective – how we want to organise this new 'paradigm' and to what ends.</u>

The values and principles that are needed to guide policy, regulation, investment, innovation, planning, safety-nets, consumer protections and technical standards to make a system in transition work for consumers are missing.

The lack of a clear 'social compact' that captures these values and principles, MEANS efforts to reform the sector – and in the context of DER, to resolve complex issues around pricing, control and access – are not bearing fruit.

I'm not sure about others, but sometimes when I'm in energy sector forums on technical issues I feel a bit like I'm trapped on the runaway bus in the classic 1994 movie *Speed*, with a terrified consumer (Sandra Bullock)

driving the bus, and our technical experts (Keanu Reeves) desperately trying to disarm an improvised device, keep the bus above 50 miles an hour, and the passengers calm …

… all without an instruction manual.

And our efforts to partner with consumers and the community in the transformation of the sector to meet emissions and other goals are frustrated because the terms of the 'deal' haven't been worked through with them.

Now while Australia special in many ways, others have recognised this problem and are beginning to respond.

I want to highlight two international examples and then refer to some important efforts in Australia that can help our thinking today.

Is there experience we can look to for guidance?

I'll start with the United Kingdom which I'm most familiar with having worked there as a consumer advocate before Energy Consumers Australia.

Now the climate policy watchers in the room will know that Theresa May, in the dying days of her Prime Ministership, legislated for a long-term, Net Zero by 2050 target.

At the same time as the Brexit debate is tearing the country apart, there is a remarkable, bi-partisan political consensus on this big objective in the UK.

What is most interesting from our point of view, is that sitting underneath this long-term target – indeed predating it – is an incredible amount of work that has been done on *'how'* transition should be managed.

This 'how' is expressed in different ways for different purposes, but I want to draw your attention to two examples which will give you the gist of what I am talking about.

Firstly, from the (until very recently) responsible minister for energy Greg Clark – who gave a major speech November 2018 – where he outlined four principles to manage the transition to a future power system:

1. The market principle – wherever possible use market mechanisms that take full advantage of innovation and competition.
2. The insurance principle – given intrinsic uncertainty about the future, government must be prepared to intervene to provide insurance and preserve optionality.
3. The agility principle – energy regulation must be agile and responsive if it is to reap the great opportunities of a smart digital economy.
4. The 'no free-riding principle' – consumers of all types should pay a fair share of system costs.

These important point to make is that these principles go well beyond the traditional competition and regulatory concepts that animated the privatisation and un-bundling of the energy system starting in the 1980s and embedded in the laws and the regulations that continue to govern the market now.

Instead we have principles going to risk and uncertainty in transition, going to a new role for government, going to cost allocation and equity issues.

Principles we can agree or disagree with, but a big step beyond the traditional approach nonetheless.

But I guess from our perspective, these principles still look a little removed from the core outcomes we want for consumers in a transforming system.

This is where influential work by the UK Energy Research Centre is relevant.

UKERC did a quite **radical** thing and went out and asked consumers across the UK what they thought!

About their values, preferences and attitudes to the transformation of the energy sector.

In essence, the problem they were trying to answer was, *what would it take to get the public to support transformation?*

UKERC found evidence that the public wanted and expected change – which they saw as inevitable – BUT – they wanted the opportunity to shape that change in line with a distinct set of principles and expressing core values. These being:

Table 1. Summary of core public values pertaining to energy system change

Principle /Value		Description
Reduced energy *use* overall Reduced use of *finite* resources		Reducing overall energy usage while simultaneously reducing the use of finite resources (as compared to the current state) will have positive consequences in terms of attaining the values outlined below.
Efficient and not wasteful	Avoiding Waste Efficiency Capturing opportunities	A system that does not involve wasting and/or produces waste products and that is efficient. A system that does not waste opportunities arising from energy system change, and capitalises on the resources and capacities ` of the UK.
Environment and nature	Environmental protection Nature and naturalness	A system that uses and produces energy in an environmentally conscious way and does not unnecessarily interfere with or harm nature.
Secure and stable	Availability and affordability Reliability Safety	A system that ensures access to energy services both in terms of availability and affordability. A system that is reliable and safe both in the production and delivery of energy services.
Autonomy and power	Autonomy and freedom Choice and control	A system that is developed in ways that do not overly threaten autonomy, infringe upon freedoms, or significantly compromise abilities to control personal aspects of life.
Just and fair	Social justice Fairness, honesty and transparency	A system that is developed in ways which are mindful of implications for people's abilities to live healthy lives. A system that is fair and inclusive and where all actors are honest and transparent about their actions.
Process and change	Long-term trajectories Interconnected Improvement and quality	A system that is developed with a focus on the long-term trajectories being created; that takes into account system interconnections and interdependencies; and represents improvement both in terms of socio-technological advances and quality of life.

The description of number five – autonomy and power – jumps out for our thinking about how to partner with consumers to get the most out of DER for them and the system:

A system that is developed in ways that do not overly threaten autonomy, infringe upon freedoms, or significantly compromise abilities to control personal aspects of life.

According to UKERC, '**reciprocity**' was the way to reconcile, or perhaps a better word is 'align' this expression of a *right*, with the *obligations* which come with being a part of a community in an interconnected system.

In the simplest possible terms what they're saying is that "I am prepared to change what I do, providing I am confident that the companies, governments, institutions do their bit, bear risk etc. too".

I want to quickly jump from one small island to another by talking about the approach in Hawaii.

ARENA recently hosted Lorraine Akiba a former Hawaiian Public Utility Commissioner, who talked about how mid-way through a major grid modernisation exercise in 2016 – the PUC called a halt to the process, developed new guidance based around a set of principles, which it gave to the companies and told them to go back to the drawing board.

The key section reads:

> *In advancing the public interest, the commission shall balance technical, economic, environmental, and cultural considerations associated with modernization of the electric grid, based on principles that include but are not limited to:*
>
> 1. *Enabling a diverse portfolio of renewable energy resources;*
> 2. *Expanding options for customers to manage their energy use;*
> 3. *Maximising interconnection of distributed generation to the State's electric grids on a cost-effective basis at non-discriminatory terms and at just and reasonable rates, while maintaining the reliability of the State's electric grids, and allowing such access and rates through applicable rules, orders, and tariffs as reviewed and approved by the commission;*

4. *Determining fair compensation for electric grid services and other benefits provided to customers and for electric grid services and other benefits provided by distributed generation customers and other non-utility service providers; and*
5. *Maintaining or enhancing grid reliability and safety through modernisation of the State's electric grids.*

Again, what stands out here is the **RECIPROCITY**: new obligations and costs but paired with new expectations about fair reward in return. And all under a preamble about advancing the public interest, and recognising, among other things, a broader set of objectives and interests, including culture.

Now here at home the National Consumer Roundtable, through its new DER Enabling Group, has started to work up a set of eight principles which covers similar territory around the public interest being advancing the overarching goal through reciprocal rights and obligations to what we're seeing in the UK and Hawaii, but cast in distinctively Australian and pragmatic terms.

In summary the principles go to:

1. The public good – government spending should be targeted to achieve social and environmental as a well as economic benefits, rather than individual benefits.
2. Fairness and equity – government spending on DER should reduce energy equality
3. Causer pays and benefits – causer pays AND rewarding benefits.
4. Transparency – visibility about system-wide costs for the public and policy-makers.
5. Materiality – assess the full costs and benefits of DER, and don't fixate on the immaterial.
6. Simplicity – speaks for itself.
7. Complementary measures – ameliorating to cross subsidy consider whether the best response is to directly help affected people.
8. Messaging – don't make DER owners the problem, find ways to empower people on low incomes and renters.

The power of language

I want to finish up by stating a strong personal belief and by making a request of everyone here today.

The strong personal belief is that framing and language – however simple and succinct – can act as incredibly powerful organising principles.

Including for things as big and complex as a transforming energy market.

We should reflect on the enduring influence of the watch-words of the last big transformation in the energy sector associated with the micro-economic reform agenda: competition; efficiency; productivity.

This point about framing is one that Yolande and Larissa make so well in their recent report on how to engage households on the future grid.

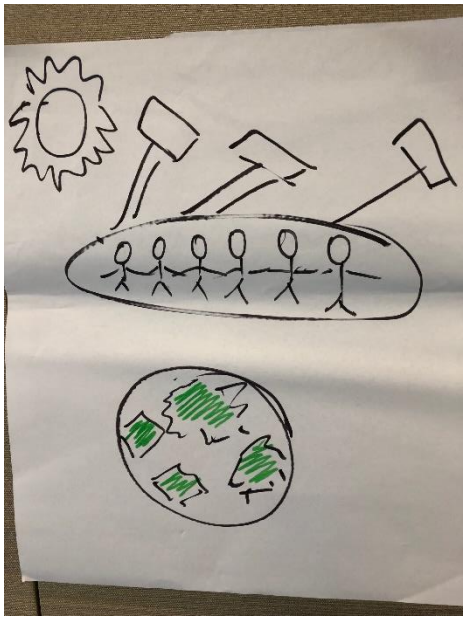
Simple language and principles that we can develop here today to capture the essence of what is important for consumers and the community in our new context can make a similar impact.

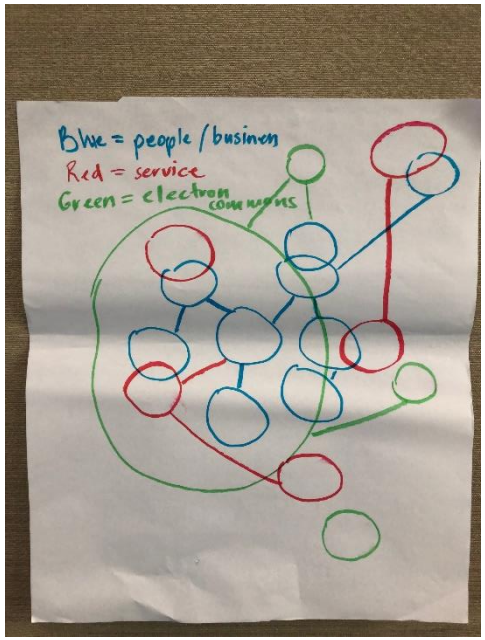
Words like my personal favourite '**reciprocity**'.

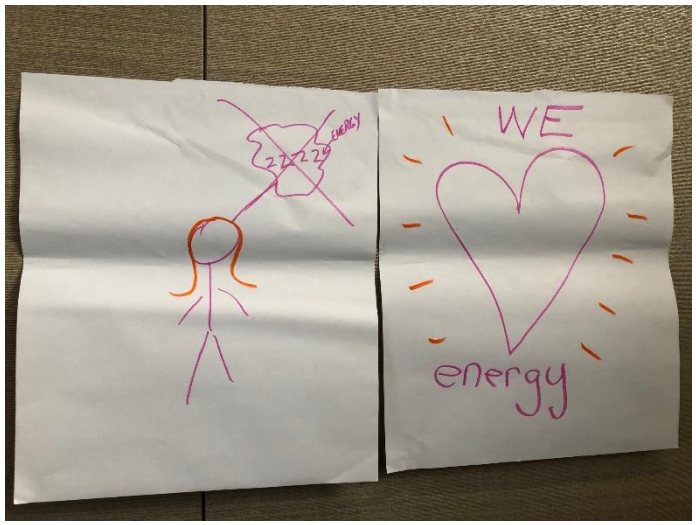
My request is to place your faith in the words, and not to become frustrated if we crank the handle today and the answers to all the technical challenges associated with DER don't magically pop out the other end.

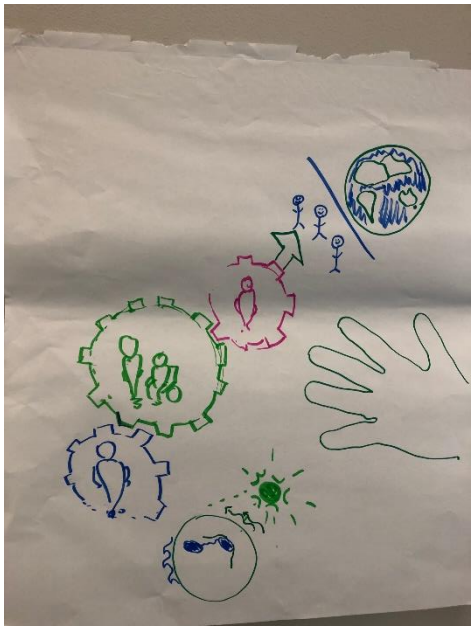
We need to be patient about the principles, and trust in the process and Trina to get us to where we need to be.

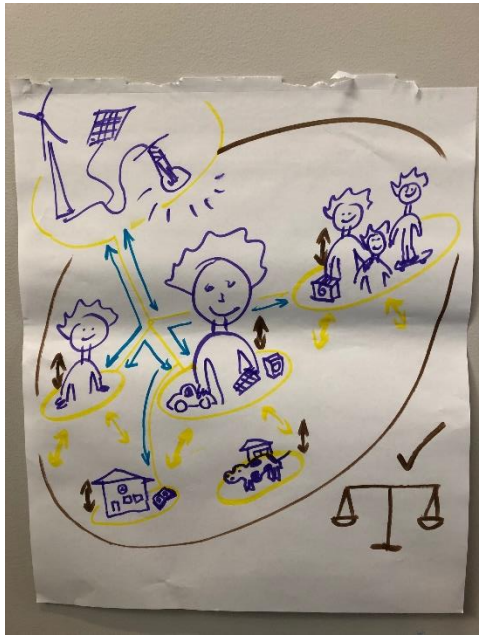
Appendix E – Outcome of group brainstorm: vision diagrams



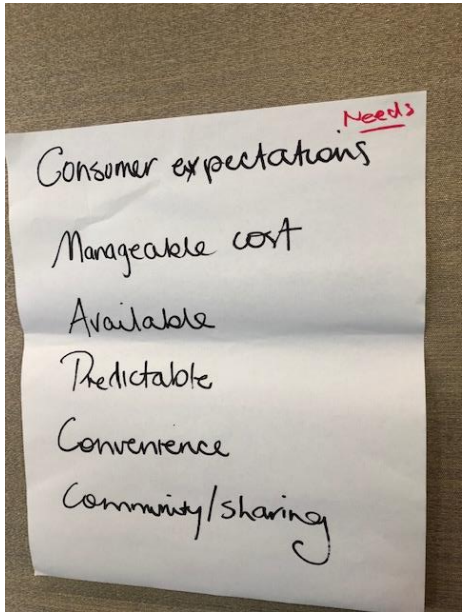


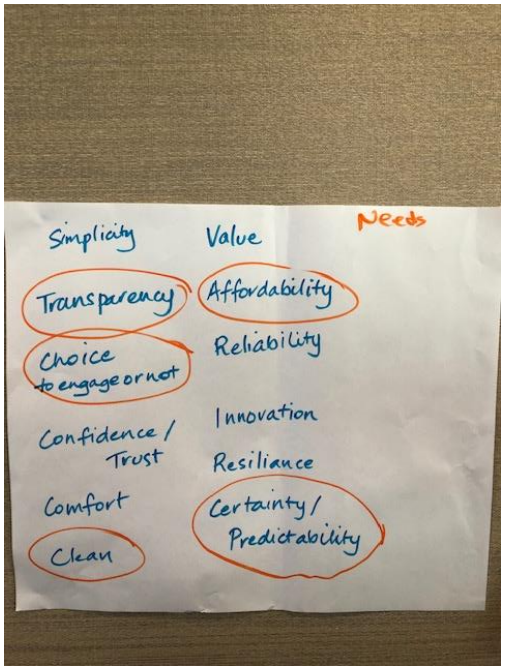


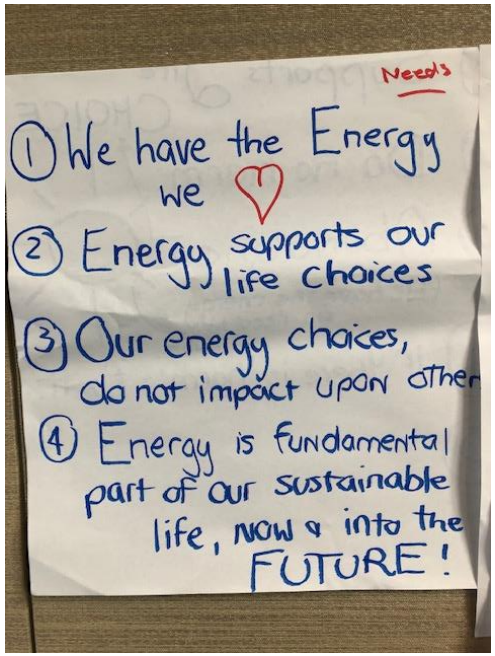


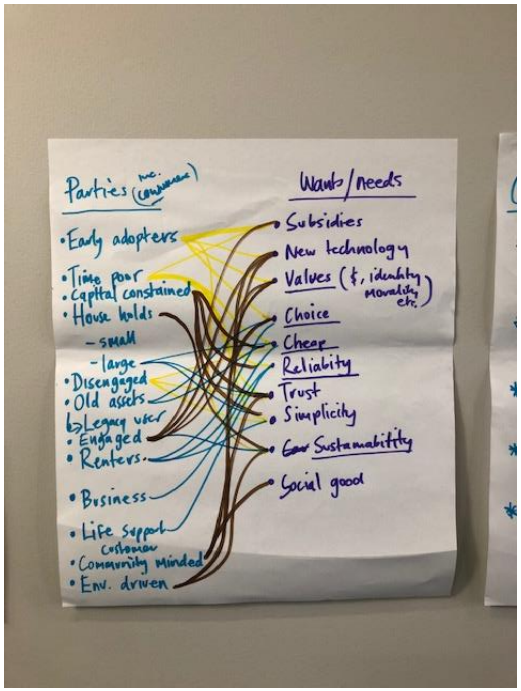


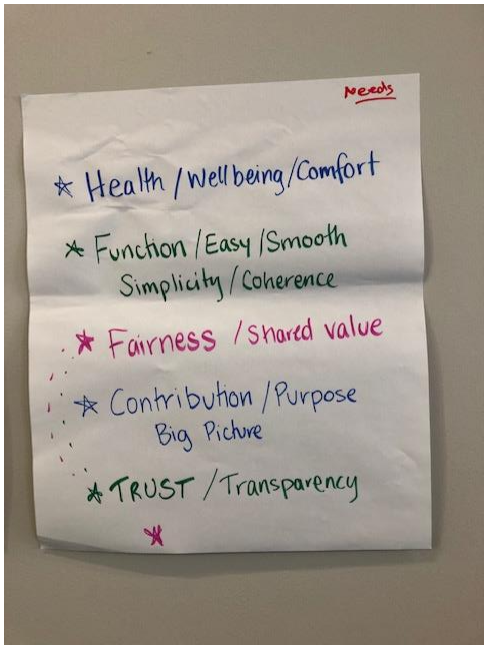
Appendix F – Outcome of group brainstorm: Customer needs

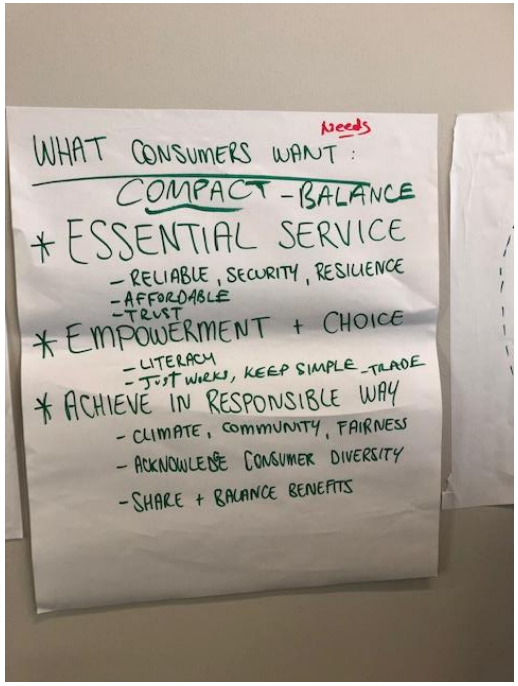




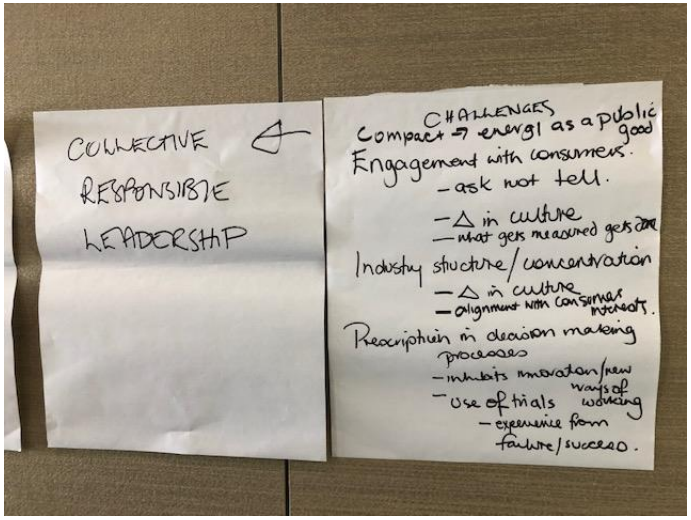


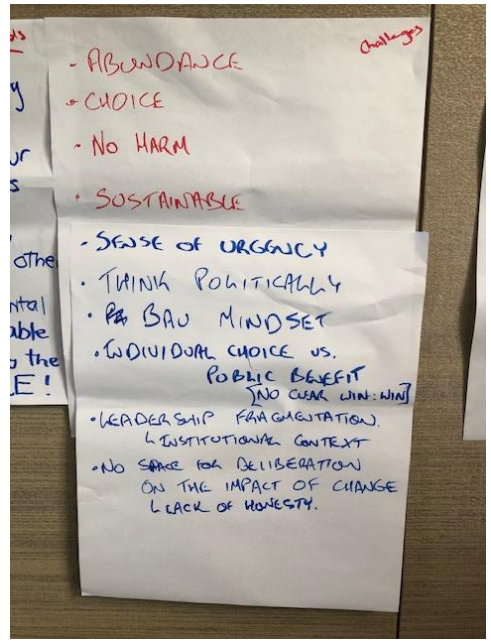


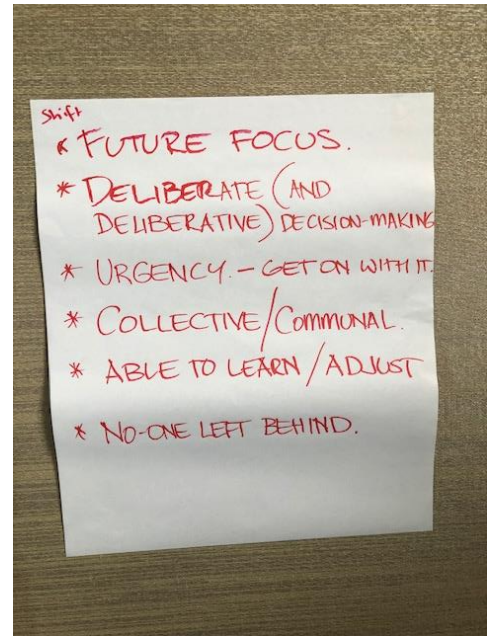


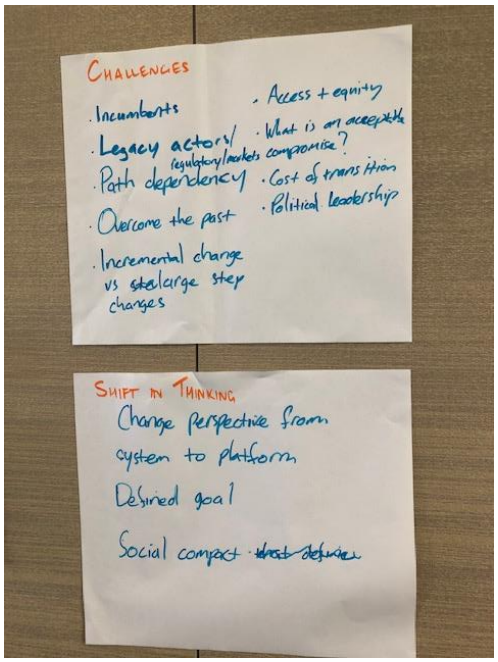


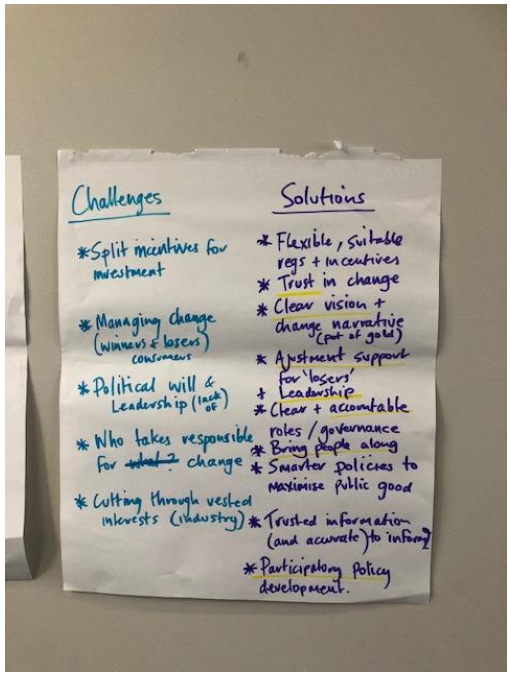
Appendix G – Outcome of group brainstorm: Challenges and what shift in thinking is required

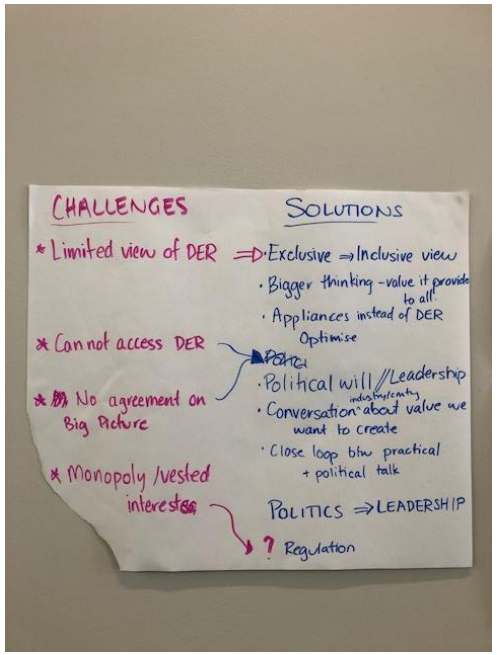


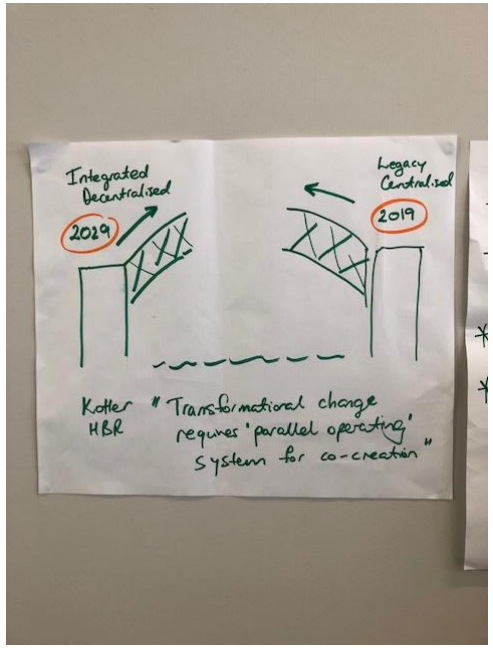












Appendix H – Outcome of group brainstorm: what are top 5 principles?