



A conversation about energy futures for remote Australian communities – summary and analysis of workshop findings

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Shortened forms

CLC	Central Land Council
CRC-REP	Cooperative Research Centre for Remote Economic Participation
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EE	energy-efficient
NatHERS	Nationwide House Energy Rating Scheme
NGO	non-government organisation
NT	Northern Territory
PWC	Power and Water Corporation (Northern Territory)

Executive summary

The ‘Energy futures in remote Australian communities’ project conducted two workshops in May 2014 with the purpose of developing a collaborative understanding of how alternative energy-related practices may impact on the future liveability of selected communities in remote Australia, focusing on housing and transport.

The workshops had the following specific objectives:

1. To understand participants’ thoughts and preferences with respect to energy-related housing and transport practices that are important for remote Australia (both in the present and considering a set of future scenarios)
2. To learn more about participants’ experiences related to the above topics
3. To seek content and process recommendations that might support ongoing dialogue and collaboration among interested participants (including processes appropriate for smaller remote communities).

The workshops were designed to build capacity of people based in particular place-based communities to answer the following key research question through dialogue and conversation, drawing upon participatory and collaborative research approaches:

If the future is uncertain, a strong economy, progressive social attitudes and policy support for energy-related innovations cannot be guaranteed. In your region, what particular policies and innovations should be promoted as no-regrets strategies, regardless of what the future holds? What policies and innovative practices may create new synergies or desired development dynamics?

The key issues that emerged from the workshops are summarised below:

Diversity	Participants raised several examples of the current housing provision system’s ability to meet diverse needs. Two key points were explored: 1) affordability of upfront costs for energy-efficient housing, and 2) the inability to service the needs of Aboriginal and Torres Strait Islander people in the housing system.
Institutional flexibility	Discussion focused on the need for solutions to combine institutional flexibility and technical innovation. Examples were explored from both the housing and transport workshops.
Innovative and recommended no-regrets energy practices	Participants valued a broad spectrum of practices, from improving end-user energy practices to urban planning.
Viability of settlements	Participants discussed the highly uncertain future of buildings and transport systems in existing settlements in light of the future scenarios. Issues related to the viability of settlements were seen as more complex than when considered from a simple ‘cost of services’ perspective.

Finally, the research team (consisting of Ninti One and CSIRO researchers) developed five recommendations, based on the authors’ interpretation of workshop findings and wider literature.

Recommendation 1:	State and Territory governments should invest in a participatory, multistakeholder review of building- and transport-related energy performance standards, including minimum performance standards and requirements for public disclosure of building and transport system energy performance. For remote Australia, the review should include the perspectives of organisations with expertise on housing and transport for Aboriginal and Torres Strait Islander people, so as to minimise unintended effects of more stringent standards.
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Recommendation 2:	Rigorous accounting methodologies are needed to assess and report on public programs that aim to improve housing and transport energy efficiency and other related performance attributes.
Recommendation 3:	Research funders and providers should invest in a systematic compilation and assessment of efforts by local groups and networks to develop practices that improve building- and transport-related energy efficiency. These initiatives should be assessed, using appropriate futures methodologies, for their potential to improve or transform conventional energy-related practices in remote Australia.
Recommendation 4:	In the remote Australian resource-constrained environment, State and Territory governments and non-governmental agencies should explore possible systems that share available transport and housing resources among multiple users.
Recommendation 5:	Researchers and research providers working in this multidisciplinary field need to make essential concepts and methodologies more accessible. Examples of such concepts and methods include scenario planning, innovation studies and collaborative governance.

To prepare for the workshops, the research team conducted a literature review and produced a Working Paper titled *A conversation about energy futures for remote Australian communities* (Foran et al. 2014a). We encourage the readers of this report to read that Working Paper, as it presents the wider project's purpose, key research questions and concepts and methods, which revolve around the possibilities for more end-user-driven innovation in energy-related systems of provisioning. The Working Paper poses some important and unresolved questions to the reader and discusses the importance of participatory approaches to conversations about energy futures. In addition, the paper also provides a framework that allows the political economy of energy-related services to be explored.

Analysis of workshop findings

Purpose of the research

In current conversations around energy issues, remote Australia figures mainly as a provider of energy and resources to a global economy. Its particular challenges and capacities for local innovation are not well understood; therefore, more attention needs to be paid to the future energy-related challenges facing remote Australia. One way to plan for challenging and confronting energy futures is to explicitly reflect on what could happen to people and communities under alternative future scenarios, taking into account uncertain future levels of factors such as policy commitment, local innovation and economic growth.

In the remote Australian context, such analysis should also try to understand opportunities that could arise from more effective, empowered, local ‘innovation’ networks. In order to support both kinds of reflection – around future storylines and around innovative responses – we need to improve the capacity of a range of actors, including government, non-government organisations (NGOs) and research providers to have productive and more rigorous energy futures conversations.

This document reports on two energy futures conversations, focused on housing and transport respectively, conducted in May 2014 in Alice Springs.¹ Based on our analysis of the workshop findings (Foran et al. 2015), we also distil a set of content as well as process recommendations.

When much of the current and future energy landscape is governed by higher level actors and forces, is it fruitful to invest in local-level futures conversations? We believe the answer is yes: energy policy regimes can occasionally be influenced by the actions of ordinary citizens and consumers. Germany’s turn to renewable energy is one prominent example.² In Australia, strong consumer interest in onsite solar photovoltaic generation (including new business models) provides another. For Australia, the systemic underrepresentation of remote issues signals that weaknesses exist in Australian democratic governance; such weaknesses are unlikely to be addressed without local action.

Method

The energy futures conversations held in May 2014 were designed to build capacity of people based in a particular place-based community to answer the following key research question through dialogue and conversation. To prepare for the May 2014 energy futures conversations, the research team (consisting of Ninti One and CSIRO researchers) conducted a literature review and produced a Working Paper (Foran et al. 2014a). This paper justifies the importance of participatory approaches to energy futures conversations and introduces a range of topics that could be covered during participatory workshops. The paper also provides a framework that allows the political economy of energy-related services to be explored.

Consistent with our interest in dialogue and conversation, and drawing on collaborative research approaches, we asked participants to consider the following statement and questions:

If the future is uncertain, a strong economy, progressive social attitudes and policy support for energy-related innovations cannot be guaranteed.

¹ An activity of the CRC-REP and CSIRO project ‘Energy futures in remote Australian communities’.

² Germany committed in April 2014 to generate at least 40% of electricity from renewable resources by 2025 (current share is 28.5%); see Eddy (2014), Morton (2014), Gillis (2014).

In your region, what particular policies and innovations should be promoted as no-regrets strategies, regardless of what the future holds? What policies and innovative practices may create new synergies or desired development dynamics?

These questions bring together two broad domains: scenario planning; and studies of innovation and social and technical transition. We define innovation essentially as social and technical learning and adaptation, not invention. The project focused on social innovations, as opposed to technological innovation. We find the concept of local innovation networks (including grassroots and niche innovations) relevant and helpful. Additional concepts from this domain include the regime of provisioning, which is based on a set of social understandings³ around housing, transport or energy. The regime is maintained when those social understandings, together with the physical infrastructure that supports them, get reproduced through everyday, often taken-for-granted practices. This focus is motivated by the proposition that remote Australia's context demands more social innovation around housing and transport. One particular type of social innovation, 'grassroots innovation', is driven by various visions of meeting social needs as affordably and inclusively as possible.

Essential concepts from scenario planning include creating explicit scenario frameworks, developing multiple contrasting storylines and assessing how different technologies and policies perform in different imagined future worlds. The no-regrets actions and positive synergies are the social and technical practices that seem to make sense regardless of what future unfolds.

Overview of the workshops

The workshops focused on developing the capacity among participants to answer the above key research question in a multistakeholder manner. The two workshops focused respectively on housing- and transport-related energy futures. Several types of participants were invited: those from organisations we had previously identified as proponents of particular noteworthy energy-related practices, representatives of government organisations, and researchers with experience in remote Australia.

Workshops began with a short introduction to the method and the three underlying concepts (scenario planning, innovation and energy-related practices). Examples of introductory materials used appear in the workshop PowerPoint presentations (Foran et al. 2014b). Participants were divided into small multistakeholder breakout groups to encourage greater interaction around the activities. Small group design allowed us to observe several replicates of the approach. A copy of the workshop agenda is provided in Appendix A, with a more detailed account of workshop responses and the theory underpinning the research in Foran et al. (2015).

Key workshop outcomes

The May 2014 workshops were not designed to seek definitive answers to all of the complex questions introduced in the Working Paper (Foran et al. 2014a). The workshops were designed to raise a range of relevant issues, some of which could be further studied by specialists, while other issues could be presented to participants for further deliberation. This section summarises the key issues that arose from the workshops.

³ Examples of social understandings include values, beliefs and rules (see Foran et al. 2014).

Diversity

Diversity in culture and social power means that people have diverse conceptions of what they need, are capable of providing for themselves and want provided. Current systems of housing provision are not meeting this set of diverse needs well, with several examples being raised by participants. A portion of society could afford higher upfront costs of more energy-efficient (EE) housing. This point is significant to us, because we would expect landlords to fall into the class of building owners who are more able to afford EE upgrades or new highly EE building designs, although under the current housing provisioning regime they are not particularly rewarded to do so.

Importantly, we also heard that Aboriginal and Torres Strait Islander people are not well served by the housing system of provision. Existing housing in towns are frequently overcrowded. Appropriate designs such as aged care residences and higher density accommodation for younger people are not sufficiently provided. Issues of racism in the private real estate market were also raised. Driven by higher future food and energy costs (and possibly encouraged by policies), more future migration to towns could occur. The innovative solutions discussed (e.g. modular housing) all appear to have a marginal or experimental status. Considering all of these points, it is difficult to escape the conclusion that the diverse needs of Aboriginal and Torres Strait Islander people, in particular, appear to be inadequately met. More innovations are needed.

Institutional flexibility

Solutions will require a combination of institutional flexibility and technical innovation. For example, the Central Land Council (CLC) set aside money to invest in community infrastructure. They chose to explore options for youth shared housing in Aboriginal and Torres Strait Islander communities and called on the Centre for Appropriate Technology for advice. The option that was trialled consisted of small shipping containers located under a larger supported roof. This configuration offers a large, shaded, outdoor space, while allowing airflow through the space beneath to aid cooling. This means the residents can exercise their preference to mostly live and sleep outside, only using the containers for sleeping quarters in the colder months.

The funds set aside were untied, which meant that the CLC had the freedom to decide how the funds would be used and could exercise their own judgement as to where it would be best spent. It also meant that they were not bound to the usual extent by government standards in regard to the building criteria and had more freedom to design options best-suited to their own requirements.

A transport example of institutional flexibility might consist of fleet management systems scaled regionally. Such systems could allow multiple stakeholders to travel more efficiently through vehicle pooling, achieving substantial savings in vehicle capital and operational costs. A possible co-benefit of a shared transport fleet may be enhanced mutual understanding among service providers leading to more effective service delivery.

Innovative and recommended no-regrets energy practices

Table 1 summarises the set of innovative practices that participants valued. Of these, they felt that a subset of these (marked with a caret [^] symbol) would be no-regrets investments. In this initial exercise we see that participants valued a broad spectrum of practices, from improving energy end-user practices to urban planning. Participants also valued institutional and grassroots innovations, which could apply across this range of domains. The diversity of practices valued aptly reflects the complexity of housing systems.

The practices in Table 1 could be supported by a number of different policy approaches, instruments and other collective actions. For example, retrofits to increase EE could be supported by more stringent building codes (a regulatory approach) as well as by market-based approaches, such as energy performance contracting, and fiscal approaches, such as subsidised loans.⁴ The ‘optimal’ package of collective actions to support an innovative practice cannot be predicted – it will depend on what future emerges. However, the further use of scenario-based techniques could inform the discussion about no-regrets policy approaches, instruments and collective actions.

Table 1: Innovative practices discussed by May 2014 workshop participants

Type of practice	Housing-related	Transport-related
Awareness raising, education and information campaigns	Smart water and energy meters (supported by PWC & Alice Solar City Program) EE rating schemes	Information on public transport access Active transport (e.g. bicycling, walking)
Retrofits to increase EE	White roofs, shading, external wall insulation, appropriate use of windows	
Commercial buildings with solar passive design	Green Well Building, Alice Springs	
Urban planning	Allowing higher density residential dwellings closer to Alice Springs central business district	Transport system integration
Institutional innovations (crosscutting)	^Culturally appropriate models of innovation (e.g. CLC approach to youth housing) Bushlight solar and hybrid power systems with management control features CoolMob (an influential social network around sustainable liveability, based in Alice Springs)	^Multiuser vehicle fleet systems ^Centre Bush Bus: network and operational model Changing the calendar of the administrative year in NT (e.g. so outdoor work can be scheduled during cooler months)
Grassroots innovations (crosscutting)	^Self-build, community-specified Aboriginal and Torres Strait Islander housing (Foran et al. 2015, section 5.3) ^Recognising and allowing grassroots sustainability innovations to persist (Foran et al. 2015, section 5.3)	Maintenance and recycling system for vehicle parts

Source: Editors. Note: ^ designates no-regrets energy practices.

Viability of settlements

The Energy Futures project has focused on improving the viability of buildings and transport systems in existing settlements. Some of the future storylines suggest that some settlements may be markedly less pleasant places to live in certain adverse futures, but did not go so far as to question their future existence. This highly uncertain future issue, however, did not escape the attention of participants in both the workshops held in May 2014. For example, participants in the Transport workshop questioned the viability of the NT’s Growth Towns strategy⁵ if energy subsidies were no longer affordable. Housing workshop

⁴ These approaches are reviewed in the *Global Energy Assessment* chapter on energy end-use in buildings (Ürge-Vorsatz et al. 2012)

⁵ In 2009, 20 settlements were designated by the NT Government as ‘Growth Towns’, including 15 existing Commonwealth Remote Service Delivery Centres. The policy vision is that these settlements become nodes that are more commercially vibrant as well as sustainable.

participants questioned the viability of living in smaller remote outstations if energy and associated prices increased. The concept of viability is, however, more complex than a simple function of the cost of services. It also depends on social conceptions of what services and at what standards are acceptable.⁶

Process outcomes

We demonstrated that it is possible to begin a conversation around energy futures with a group of actors representing different interests (responsibilities, worldviews, backgrounds). Not only that, but participants seemed to enjoy the opportunity given by the structured methodology to discuss and debate energy futures issues. Groups appeared to appreciate the opportunity to have in-depth discussions about a subset of innovative practices, as opposed to a more superficial interaction with a larger array of practices (for example, through a questionnaire survey).

While room exists for both surveys and in-depth discussion, the implication from participant evaluations is that the multistakeholder social space provided during the May 2014 workshops was valued positively (Table 2). In particular, respondents agreed that energy-related issues were complex. They considered that contributions made by other respondents were important and based on reasoned argument. They also believed in their potential ownership of the collaborative process (Table 2, Q4) and recognised their interdependence on other organisations (Table 2, Q7). The evaluation questions were based on five concepts viewed as drivers of collaboration in the literature on collaborative governance.

Table 2: Participants' responses to evaluation questions (n=9, 56% response rate)

Item	Average	Min.	Max.
(Q1) [Mutual understanding] I have a better understanding of how other participants think.	4.0	2	5
(Q2) [Mutual understanding, complexity] Other participants raised many other important goals and policy options.	4.2	3	5
(Q3) [Reasoned argument] The arguments put forward by other participants were reasonable and not simply reflections of their personal or organisational interests.	4.0	3	5
(Q4) [Shared ownership] It is important for me to continue providing inputs into this process, even on topics beyond my agency's mandate.	3.9	2	5
(Q5) [Uncertainty, complexity] We need to take uncertainty in remote Australia's energy-related systems into account more seriously.	4.6	3	5
(Q6) [Complexity, uncertainty] We need to diversify our policy goals and options.	4.7	4	5
(Q7) [Interdependency] In order to improve energy-related liveability, I need to improve my understanding of how my organisation depends on other organisations.	3.9	2	5

Notes: Responses based on a Likert scale: 1 = strongly disagree, 5 = strongly agree.

Key recommendations

The recommendations offered here are based on our analysis and interpretation of workshop proceedings, supplemented by the additional literature review (Foran et al. 2014a).

Recommendation 1

State and Territory governments should invest in a participatory, multistakeholder review of building- and transport-related energy performance standards, including minimum

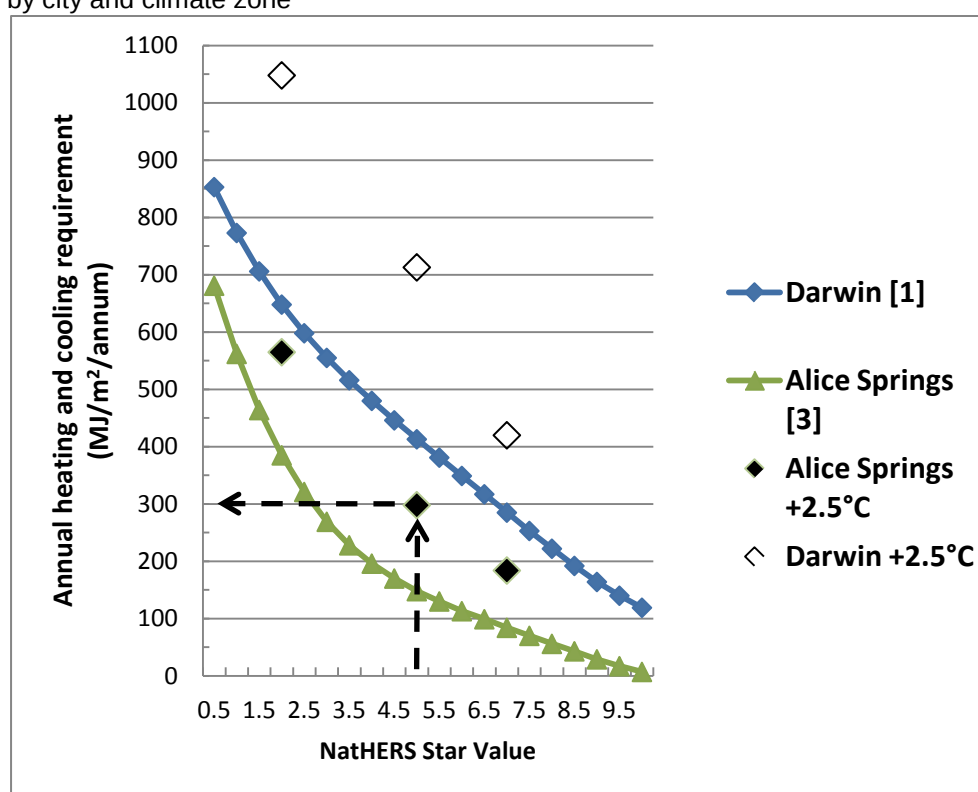
⁶ See Stafford Smith and Cribb (2009, pp. 103–109) for extended discussion.

performance standards and requirements for public disclosure of building and transport system energy performance.

For remote Australia, the review should include the perspectives of organisations with expertise on housing and transport for Aboriginal and Torres Strait Islander people, so as to minimise unintended effects of more stringent standards.

Buildings: Because they do not yet anticipate future impacts of climate change or possible impacts of carbon policy, existing building energy codes appear to serve Australia poorly (Wang et al. 2010; Strengers and Maller 2011). Since May 2010, the current residential building energy efficiency performance requirement in the NT is 5 stars for new homes and extensions and 3.5 stars for apartments. However, by 2050, with anticipated climate warming, 5-star houses in Darwin and Alice Springs will require, respectively, about 72% and 101% more energy than they do today (Figure 1).

Figure 1: Annual heating and cooling requirements corresponding to Australian house energy ratings by city and climate zone



Note: Arrows show how increased cooling requirements under +2.5°C downgrade the EE rating of a 5-star house. The number in brackets refers to the Nationwide House Energy Rating Scheme (NatHERS) climate zone.

Source: Authors, based on NatHERS (2010); and Wang et al. (2010) for +2.5°C.

This means that by 2050, a house built in Alice Springs to a 5-star level will actually perform at a 3-star level or worse (Figure 1, dashed arrows). Similarly, an apartment built at 3.5-star level will actually perform at a 2-star level or worse by 2050. For Darwin, the anticipated impacts of climate change are even more severe: a 5-star house in Darwin performs at a 1.5-star level or worse by 2050. An apartment built at 3.5-star level is expected to perform at approximately a 0.5-star level by 2050. In order to perform at a 5-star level in 2050, a house built today would need to achieve approximately an 8-star rating.

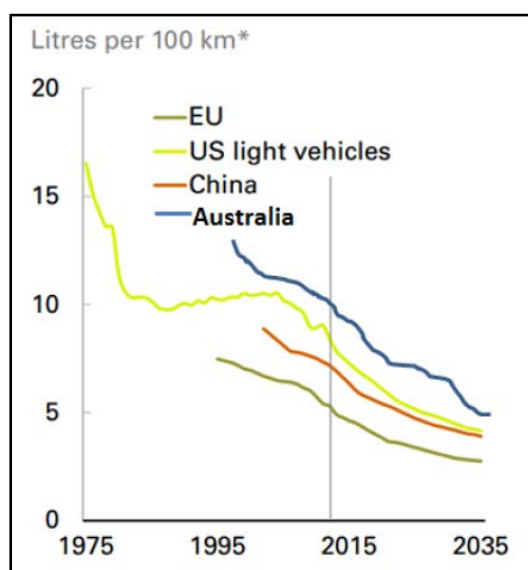
Once long-term, life-cycle costs and benefits are taken into account, the existing housing regime is inadequate. For example, analysis for a cool, temperate climate such as Melbourne shows that investing in

high-efficiency (8 star) homes yields net positive present values (a measure of benefit to cost) compared to a 5-star baseline (Morrissey and Horne 2011, Morrissey et al. 2013). This finding holds across a range of future energy prices and discount rates. We would expect that investing in 8-star homes in central Australia would provide similar net benefits. Moreover, the analysis by Morrissey et al. (2013) did not include increased cooling loads resulting from a warming climate. Once climate change is taken into account, net present values would increase beyond those reported by Morrissey et al. (2013).

Transport: With respect to transport systems in remote Australia, very significant inequalities exist in terms of safety, access, efficiency and affordability (Spandonide 2014).

While these issues interact with each other in a complex and multidimensional way, existing transport energy efficiency standards in Australia are not on par with international best practice (Figure 2).

Figure 2: Historical and projected average fuel consumption, light vehicles, 1975–2035



Source: Editors, based on British Petroleum (2014). Australian projections based on Li et al. (2008, 2009) and Diesendorf et al. (2010).

To date, very little fuel consumption research exists that is specific to remote Australia. Available data indicate that average fuel consumption in remote Australia is 20–50% higher than in urban Australia. This is the result of a predominance of unsealed roads, requiring the use of off-road vehicles, combined with an over-representation of inefficient second-hand vehicles (Young 2001, Worth and Endean 2005, Holcombe 2006, Perriot 2008).

Only 50% of the population in remote Australia has access to public transport, compared to 82% in non-remote Australia (Australian Bureau of Statistics 2010). High levels of diesel fuel use have been reported (Green Energy Taskforce 2012), and diesel fuel costs are 20–100% higher in remote Australia. The majority of the most disadvantaged households in remote Australia spend over 30% of their income on transport activities, with half accounting for fuel costs (Spandonide 2014). High transport costs significantly magnify living costs (Doll et al. 2014, Litman 2014, NT Council of Social Service Inc 2014).

Consistent policy development to further encourage the use of more fuel-efficient vehicles and safer, more regular public transport services would contribute to enhancing the economic participation, self-sufficiency and resilience of remote communities and enterprises.

Providing coherent national transport safety, access and emissions standards would allow more consistent benchmarking by State and Territory agencies developing transport policies. A particular need exists for cross-border and cross-department collaboration in documenting best practice and tools, both to develop national guidelines and to implement appropriate policies for remote Australia.

Recommendation 2

Rigorous accounting methodologies are needed to assess and report on public programs that aim to improve housing and transport energy efficiency and other related performance attributes.

Methods and techniques by which costs, benefits and other performance indicators are assessed by organisations receiving public funding need to be publicly accessible. For example, utilities in North America administering EE programs have developed a range of accounting tests, approved by independent regulators, by which they evaluate and report on cost effectiveness (Molina 2014). Such evaluation protocols contribute significantly to integrated, demand- and supply-side energy services provision. In addition to expected climate change, such methodologies should also incorporate future uncertainty (i.e. they should go beyond deterministic cost-benefit analysis techniques).

Recommendation 3

Research funders and providers should invest in a systematic compilation and assessment of efforts by local groups and networks to develop practices that improve building- and transport-related energy efficiency. These initiatives should be assessed, using appropriate futures methodologies, for their potential to improve or transform conventional energy-related practices in remote Australia.

From the perspective of mainstream society, certain initiatives or efforts may appear marginal or unviable (e.g. rammed earth housing in central Australia). Adapting to energy futures, however, means we need to re-assess the value of such initiatives in alternative future landscapes. As part of such an undertaking, it is also important to understand how and why innovative practices emerge and are sustained, or not, in particular places and times.

Recommendation 4

In the remote Australian resource-constrained environment, State and Territory governments and non-governmental agencies should explore development of systems that share available transport and housing resources among multiple users.

For example, vehicle fleet systems could allow multiple stakeholders to travel more efficiently through vehicle pooling, achieving substantial savings in vehicle capital and operational costs. A possible co-benefit of a shared transport fleet may be enhanced mutual understanding among service providers, leading to more effective service delivery.

Recommendation 5

Researchers and research providers working in this multidisciplinary field need to make essential concepts and methodologies more accessible.

Addressing energy futures requires more than creative technical solutions. We believe the search for social and technical solutions will be easier if, in particular communities of place and social networks, collective capacities are built, for example, the capacities to:

1. listen to different values and beliefs
2. tolerate and make productive use of scenario thinking, which inevitably includes a capacity for abstract thinking
3. to unpack different components of systems of housing and transport provisioning.

Based on the analysis of the workshop findings (Foran et al. 2015) and literature reviewed in the Working Paper (Foran et al. 2014a), three fields – scenario planning, innovation studies and collaborative governance – offer concepts of value. Established connections exist between scenario thinking and innovation studies. We need to understand the potential of these approaches to deepen collaborative engagements, which unfold more gradually over time as trust and commitment are built. More experience applying such concepts in remote Australia will allow policy actors and researchers to independently assess which concepts and techniques are essential to acquire and use more widely to plan for energy futures.

Appendix A: Workshop agenda

	Session and topic	Presenter/Facilitator
08:00 – 08:30	Registration	
08:40 – 09:10	(1) Welcome, Introduction to Project Participant self-introductions Review agenda	S. Morton (Facilitator)
09:10 – 10:00	(2) Key issues – presentation	T. Foran, D. Fleming Interactive Q&A
10:00 – 10:20	Morning tea	
10:20 – 12:00	(3) Energy-related housing practices that support liveability	Group discussion Feedback to plenary
12:00 – 13:00	Lunch	
13:00 – 14:00	(4) Overview of energy-related futures for Australia – concepts, storylines, techniques	T. Foran, D. Fleming Interactive Q&A
14:00 – 14:45	(5) (Part I) Implications of alternative futures for innovative energy-related practices	Group discussion
14:45 – 15:05	Afternoon tea	
15:05 – 15:50	(5) (Part II) Implications of alternative futures for innovative energy-related practices	Plenary discussion
15:50 – 17:00	(6) Next steps: discussion between science team and participants Meeting evaluation Closing remarks	All participants Facilitator

Note: Based on Housing Workshop 13 May 2014.

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