Visions and Scenarios of Low-Carbon and Resilient Australian Cities in 2040

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Abstract: Visions and Pathways 2040 is a research and engagement project that seeks to envision possible future forms of Australian cities and lifestyles in 2040 if they have achieved an 80% reduction in their greenhouse gas emissions (on 2013 levels) and have addressed broader resilience issues, and, secondly, to ‘backcast’ from visions possible pathways to the present that may, in turn, suggest policies, strategies and governance structures for reaching them. This paper describes the approaches that were used in the initial phases of the project and early research results. A selection of the ‘glimpses’ of possible future low-carbon, resilient city forms and their associated lifestyles are presented. The ‘glimpses’ convey emerging aspirations for urban change, such as those related to localised resilience, cultural change, and community sustainability. We also outline an initial set of scenarios end-states (i.e. set in 2040), describing alternative futures of sustainable, resilient Australian cities based on different possible trajectories of social and technological drivers of change and emerging disruptive innovations. Elaborating and critically examining the set of scenarios, consulting further on specific domains of disruptive innovation, and developing governance and policy implications are part of the next phases of the project.

1. Introduction

As with other Cooperative Research Centre for Low Carbon Living (CRC LCL) projects, Visions and Pathways 2040 (VP2040) is about understanding the trajectory of urban development and intervening to change it. VP2040 is more unique in its core focus on city-scale change. The project seeks to envision some of the forms that major southern Australian cities and lifestyles might take in 2040 if they have achieved an 80% reduction in their greenhouse gas contribution and have addressed vulnerabilities that arise with changing climates and extreme events. These visions and related scenarios will also be used to consider the policy, investment and further research that could bring them about.

The aim of this paper is to present and discuss the main research results to-date. These results include ‘glimpses’ or optimistic visual projections of elements of possible future low-carbon, resilient cities and associated lifestyles, along with preliminary ‘proto-scenarios’. In recent phases of the project, only the scenario end-states (i.e. outcomes) were explored in-detail. In future phases we will conduct backcasting exercises to consider how scenario end-states could be achieved or otherwise arise.

The outline of this paper is as follows. Section 2 outlines background literature, similar projects and theoretical considerations that have influenced the project. Section 3 expands on the project description provided above and describes the methods which have been used. We then present an outline of the research results (Section 4). Section 5 and 6 provide a brief discussion and conclusions.

2. Background literature and theoretical considerations

The project is located within a number of related traditions and literatures. These include various so-called ‘futures’ techniques, such as scenario and backcasting methods, which are used as a means to explore, debate and shape possible futures (Dixon, 2011; McGrail & Gaziulusoy, 2014). These methodologies have a long history, with a number of traditions such as in futures studies (Slaughter, 2002; 2004) and urban planning. Many projects have recently emerged in the EU, Canada and the USA that use similar collaborative and creative visioning’ approaches to urban futures in a climate change constrained world. Some particular projects that we have followed and have had an influence on VP2040 include RETROFIT 2050 (http://www.retrofit2050.org.uk/), SPREAD (http://www.sustainable-lifestyles.eu/), CRISP (http://crisp-futures.eu) and VISIONS 2030 (http://www.visions2030.org.uk/).
Given the complex nature of the city, and the systemic challenges implied by decarbonisation and building resilience, an ongoing research task of the project has been to adopt a ‘systemic’ big picture perspective and look for disruptive forces that could have systems-wide effects. In the related sustainability transitions field, transitions towards sustainability are typically ‘framed from a systems perspective’ (Farla et al. 2012, p. 991). In taking such a systems-wide perspective, the project is particularly interested in innovations that are directed to ‘redesigning entire systems of practices and provision, instead of individual products or processes’ (Sterrenberg et al., 2013, p. 9). Focusing on the design of the entire system potentially leads to much greater sustainability gains than can be achieved from single product or process innovations such as have been the focus of traditional eco-design (Gaziulusoy & Brezet, 2015; Brezet & van Hemel, 1997; Ryan, 2004). “Disruptive” forces are defined in VP2040 as an ‘area of change or innovation that is capable of shifting the trajectory of development in nonlinear ways’ (Ryan et al., 2014, p.43).

This project is also set against the low carbon agenda which seeks to move countries and cities towards a more sustainable future. An examination of eco-cities and role of cities in the transition to a low-carbon economy is the subject of a forthcoming project report (Kautto & Ryan, forthcoming).

3. Project design and research methods

The progression of the project and how the various elements of the project are integrated are illustrated in Figure 1. Central to VP2040’s methodology is multi-stakeholder dialogue. As such, the use of participatory workshops such as visioning workshops has been an important dimension of the project. This is based on the idea that a process of extensive engagement and open collaboration will aid in addressing the multidisciplinary dimensions of cities and urban life and can potentially also help build a stronger consensus on desirable urban futures. To this end, the overarching project design follows basic principles of participatory action research, a methodology where ongoing steps in a project are shaped in response to findings of workshops and by subsequent stakeholder/partner engagements. At the time of writing one scenario workshop has been held in Adelaide and the Perth workshop is being planned.

Figure 1. VP2040 processes and progress

3.1 Visioning processes and methods

Two visioning workshops were conducted in 2014, one in both Melbourne and Sydney. The workshops aimed to develop ‘glimpses’ of the shape and life of low carbon and resilient future cities in Australia,
where significant deviations from the current trajectory of development has been achieved (i.e. resulting in deep emissions cuts and urban resilience). The process design and choices are described in detail elsewhere (McGrail et al. 2015a; 2015b), but a brief outline is provided here. A two-stage process was used. In brief, the workshops were a process of open dialogue designed as a modified ‘world café’ style process, in which participants moved through fixed themed tables (regarding mobility, energy systems, food and water, buildings and public space, and behaviours and social/cultural activities) and they were encouraged to share and develop ‘visionary’ ideas about what 2040 could be like. The participants were a cross-sectoral group of innovative or visionary thinkers – sometimes termed “frontrunners” – identified by the project team. Depending on the workshop a smaller group of selected designers either hosted or observed the table-based discussions and subsequently drew on these discussions to produce ‘glimpses’ of low-carbon futures in 2040. In the second stage, participants returned for a second workshop to see and hear what the designers had produced. This second workshop was structured more as a type of focus group, where the concepts were interrogated and debated in small groups.

3.2 Approaches used for scenario development

Initially we considered common scenario ‘building blocks’. Underlying forces of change, often termed drivers of change (or “driving forces”), are commonly discussed in terms of the STEEP framework, i.e. social, technological, economic, environmental and political drivers. The team collected a long list of drivers of change, based on desktop research and a survey of expert citizens. Extending the STEEP categories to six, we explicitly incorporated demographic and geographic trends. Second, we sought to identify emerging areas of disruptive innovation. A disruption was defined as a change(s) which significantly disturbs the status quo. This research and outputs from the visioning workshops were drawn on to identify scenario dimensions, such as those related to urban form and land-use.

Methodologically, the scenario development process was mostly inductive. Drawing on earlier research findings, research team members proposed and debated possible scenarios. Common quality criteria were used such as wanting challenging, divergent, plausible characterisations of possible futures. Additionally, the research team attempted to combine multiple elements – ranging from concepts in the ‘glimpses’ to trend data – into coherent description of plausible futures of sustainable and resilient Australian cities. Logical coherence was attempted through different core socio-politico-economic conditions. In addition, differential uptake of social and technological innovations was considered, according to the core scenario ‘logic’. Following this analysis the city-level implications will be explored, but this is not reported here.

This approach can be contrasted with deductive scenario-building approaches, which often proceeds by choosing a pair of critical uncertainties and populating a matrix (van der Heijden, 1996). The multi-dimensional nature of cities meant that a 2x2 framework was considered inappropriate.

3.3 Other concurrent research activities

Three PhD students started their candidature at the three universities collaborating in this project. Their projects focus on distributed energy generation in cities; open space in suburban areas; and urban redevelopment models for achieving greater residential density. Expert workshops are also conducted to provide a deeper ‘dive’ into identified areas of potential ‘disruptive’ change.

4. Outline of results produced to-date

4.1 Glimpses of low-carbon resilient urban futures

Glimpses were produced by each designer at three scales ranging from households/building scale to city-scale urban environments. A small selection at each scale is presented below in figures 2, 3 and 4 (see http://www.visionsandpathways.com/research/visions/ for a fuller range).
In 2040, the sharing economy and maker culture have become mainstream. With the help of smart technologies, redundant postboxes have been converted to book and toy exchange hubs. Each community shares a 3D printer. Carbon footprints are also monitored in real-time, both individual and community carbon footprints.
This residential home in 2040 generates its own energy from wind and solar. The house harvests rainwater and uses blinds and a ‘green roof’ to regulate its temperature. The residential vehicle is electric.

By 2040, some buildings in Melbourne had been abandoned due to heat and their excessive running costs during climate extremes. These buildings are being repurposed as urban greenhouses.
Figure 3: A selection of glimpses at the scale of communities, precinct, suburb and related support systems

Cycling takes priority in this streetscape of Melbourne 2040. Bicycle lanes are widened to encompass the road and, while cars still exist, they are considered a form of public transport. They are smaller, solar powered and used communally. Food is grown in garden beds to reduce ‘food miles’ and the tram continues to be an integral part of the city’s transport.

Suburbs are no longer just a myriad of introverted cul-de-sacs. They are strongly inter-connected with pedestrian-orientated streets that promote a community-based culture. Streets and areas within our suburbs are differentiated with more shared ways for people, bicycles and shared-vehicles which are clearly differentiated from those for through-transport.
A sharing and exchange culture in communities is enabled by information technology such as online brokering services where people can list and exchange needs, skills and capacities. Sustainable options, for any situation, are available from “Low Carbon” Broker Apps which help minimise community carbon use. People post requests, such as moving furniture across the city, to which other community members can respond.

In Glebe, in the Inner West of Sydney, the Living Road has helped to revitalise a community that was lifeless and where much of the street space had been used for car parking. Now the street is a public plaza with many residents having converted their living spaces into offices, cafes, and other small businesses. The street is now a place of collective pride and play. People are comfortable with having barbecues and social gatherings in the street.

At its simplest level, a “living road” takes in sunlight and uses the energy to power a hi-speed Wi-Fi network and provide electricity. It comprises many layers and is a hybridisation of biological and technological systems.
The South Bank district (in Melbourne) has been heavily planted to address the urban heat island effect. It has become a site for urban agriculture, some commercial and some community run. Aquaponic farms are located on the river edge along with the introduction of terraced farming. The bridges crossing the river provide pedestrian connection and new ways to experience the city. River traffic has greatly increased and it is all electric or hybrid. While the density of building around the river has greatly increased the net effect is a more natural, bucolic environment.

4.2 Proto-scenarios of low-carbon, resilient cities and key scenario inputs

This section provides a brief outline of the four core ‘proto’ scenarios. Before outlining these, related research results on key drivers, trends and scenario dimensions are summarised.

Drivers of change

We identified a large number of drivers in six categories: (i) socio-cultural drivers, such as the cultural environment and changes to it, and the (relatively) enduring social structures (e.g. socio-economic structures) which influence human behaviour; (ii) geo-demographic drivers, such as demographic changes (e.g. ageing populations) and changes in the use of land and nature (e.g. urban sprawl); (iii) technological drivers, such as technological advancement (i.e. technological change as a driver of change) and associated drivers such as learning rates in emerging technology development; (iv) economic drivers, such as changes to the macroeconomic situation and related economic cycles and policies (e.g. interest rates), changes in housing market confidence, and the rate of foreign investment (e.g. in the housing market); (v) environmental drivers, such as the level of climatic variability and change (e.g. changes in the frequency of extreme weather events), and the degree of natural resource availability/competition; and, finally, (vi) political drivers, which include relevant macrosocial, geopolitical forces/factors (e.g. related to oil supply and prices) and lower level factors such as the level of federal government support for (or opposition to) new urban redevelopment models. These categories are interrelated and often overlap.
example, the advancement and uptake of new technologies is often considered a technological driver of change but it is equally a social process which, furthermore, is also influenced by political drivers which shape the policy environment. A summary of the important drivers of change and related disruptive forces that are shaping Australian cities is provided in Figure 5 below.

Figure 5: Drivers of change and disruptive forces shaping the future of Australian cities

Trends that could prove disruptive for Australian cities
Seven main trends that could be particularly disruptive for Australian cities were identified:

Small-scale renewable energy technologies and reductions in electricity consumption
More than 1.2 million rooftop solar photovoltaic (PV) systems have now been installed in Australia, up from only 8000 in 2007 (Flannery & Sahajwalla, 2013). While many of the subsidies for solar have been removed, the continued fall in the cost of PV cells, development of lower-cost localised electricity storage systems, more active user/consumer engagement and new business models may contribute to further significant changes in this area over coming decades (CSIRO 2013).

The sharing economy
The concept of the ‘sharing economy’ has become mainstream over the past few years (Botsman, 2014). Information and communications technologies (ICTs) and online platforms have enabled more people to share resources, skills and property in new ways and have led to access-based consumption models. There is great potential that these will expand and move into new areas in the coming decades.

New technological urban infrastructures / smart cities
A set of new information technologies and innovations has led to the prospect of: a) urban environments that are sensored/measured/monitored using communication technologies (forming a city-embedded internet of things); b) new urban management systems based on real-time analytics (i.e. ‘smart cities’);
and c) new forms and modes of virtual interaction. These all have the prospect for facilitating various types of efficiencies and shaping behavioural changes for more sustainable cities.

**Distributed systems and distributed manufacturing models**

More distributed systems of infrastructure and critical services systems are offering new ways to address concerns about the vulnerability of existing infrastructure, and have potential for localised and networked systems to provide additional social benefits.

**Infill objectives/development and associated challenges**

There is widespread agreement among state agencies and other government bodies responsible for strategic planning in Australia’s major cities that future development and redevelopment needs to be more compact and principally within established urban areas. This is termed ‘infill’ (Newton, 2012). However, the achieved rate of infill housing has been well below the targets listed in metropolitan planning strategies (Newton, 2012). If infill targets are not met, the net result will be further low-density urban sprawl (as has been seen in Melbourne and Perth) and potentially a consequently larger environmental footprint. Urban infill is thus a major urban governance and innovation challenge.

**Population growth, declining housing affordability and ‘Generation Rent’**

A growing minority of lower-income Australians are not affordably housed, and home ownership is not the readily achievable goal it once was for an increasing number of people. Furthermore, if current trends continue (for example, if fertility, net overseas migration and life expectancy rates continue in line with recent trends) Australia’s population will grow to around 30 million in 2030, with approximately 20% of the population older than 65 (up from 14% today), and to around 40 million in 2060 (Australian Bureau of Statistics 2014). As the ABS note, these trends and projected population levels have implications for the need for amenities such as housing, along with the level of infill or low-density sprawl.

**Disruptive corporate governance, financial and investment initiatives**

A rapidly expanding range of innovative corporate governance and financing strategies are creating significant new opportunities for disruptive investment in low-carbon urban infrastructure, technologies and systems. These include new business models such as Benefit Corporations, not-for-profit social enterprises, climate bonds, crowdfunding and open source business models.

**Preliminary scenario dimensions**

Drawing on all the above research, and the debate and discussion in the initial visioning workshops, we identified an initial set of scenario dimensions. These are summarised in Table 1 below.

**Table 1: Seven main scenario dimensions and associated major uncertainties**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Major uncertainties</th>
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<tbody>
<tr>
<td>Centralised/distributed systems of provision</td>
<td>How centralised or distributed will our city systems of provision be? Will energy systems become more distributed over the next 25 years? Will other systems of provision (for example, of food and water) also become more distributed? At what scales will this occur and to what extent?</td>
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<tr>
<td>The characteristics and use of urban space</td>
<td>What will be the balance of public, private and shared spaces? Will current preferences for private space shift towards greater sharing? What will be our attitudes towards open, public spaces and private spaces and their possible trade-offs?</td>
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<tr>
<td>Urban form</td>
<td>What will be the spatial form of future Australian cities? Will density increase or will urban sprawl continue? Will higher density housing only be achieved through high-rise residential towers or are other models available such as small-lot, low-rise housing? Will urban form also be ‘distributed’ – such as a polycentric city of urban villages?</td>
</tr>
<tr>
<td>Embedding of new informational and 'smart' technologies in urban and household environments</td>
<td>To what extent and degree will cities be embedded with, and be dependent on, new information and communication technologies? How will the ‘internet of things’ develop in the urban context? Can such systems move beyond making current systems more efficient to assisting transformation? How will privacy/surveillance concerns influence the development and use of these technologies?</td>
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Relative importance of production and consumption in emissions reduction

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<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>Will emissions reductions come primarily through production efficiencies and changes (e.g. through greater adoption of low-carbon or zero-carbon energy production technologies), or primarily through changes in consumption patterns and lifestyles?</td>
<td>To what extent will the sharing economy contribute to emissions reduction (e.g. through avoided consumption)? Will consumption continue to grow or will there be a moderation or even decline?</td>
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Ways of life within the city (how lifestyles and norms may change)

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<tr>
<th>Question</th>
<th>Answer</th>
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<tr>
<td>Will our values shift in the direction of greater individualism or greater collectivism?</td>
<td>How will this influence other dimensions such as the use of urban space and forms of economic exchange (market exchange, reciprocal exchange, and so on)? Will there be an emphasis on individual freedom, private ownership and related ways of living or a more collective and communal approach? How will these values influence the use of urban space and related systems of provision? How will they influence consumption (by, for example, a culture of sharing or willingness to pay premiums for sustainable goods and services)?</td>
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Economic and political institutions

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<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>Will economic and political institutions remain similar to the present liberal market economy or will these institutions evolve?</td>
<td>On what level(s) could such changes occur – local, state, national or beyond? How could these changes influence low-carbon development and/or societal resilience (e.g. community-energy projects vs private sector energy projects etc.)?</td>
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Initial proto-scenarios of low-carbon, resilient cities

The following first-pass or ‘proto-scenarios’ for southern Australian cities out to 2040 focus on scenario end-states/outcomes rather than presenting scenario storylines (which outline the events and social processes that could plausibly lead to those outcomes). Additional work is currently exploring these scenarios in the context of specific Australian cities, including interrogating the potential implications of such scenarios, and examining the challenges and plausibility of the scenarios.

Scenario 1: “Market-Driven Living”

Keywords: Efficiency; circular economy; energy technology; service economy; electrification.

Scenario end-state description
This is the city of efficient production. A market economy has focused innovation on triple bottom line success. Large, for-profit companies are the primary actor in the economy. Significant decarbonisation of the city has been achieved principally through a focus on changing production, with shifts in consumption patterns only as necessitated by those changes.

Electricity is now more than 95% renewable even though consumption of electricity has grown. Technology is focused on delivering highly energy efficient products; the service sector is large with an increasingly diverse range of businesses aimed at assisting in the efficient management of energy, food, water, transport and waste from a carbon perspective. Innovation and application of information technology within the city helped to create a city that is smart and efficient. Market competition in smart city technologies is significant. Within the mix of products and services, the economic identity of the city is strongly consumerist and individualistic, with wealth, status and economic growth as political goals and a societal priority.

Scenario 2: “Planned Efficient Living”

Keywords: Centralised governance; social equality/egalitarianism; public service; sustainable urbanism.

Scenario end-state description
This is the city of planned order. Everywhere in the city there is evidence of a past democratic consensus that the challenges posed by a carbon and resource constrained world are best addressed through tighter regulations that limit behaviour and practices to an acceptable environmental norm. Rational and technocratic approaches guide all areas of development. An 80% reduction in greenhouse gas emissions has been achieved through pricing carbon, investing in renewable energy supplies, reducing per capita
energy consumption through technological efficiencies and changes in social behaviour, planning for a more compact city, comprehensive and integrated public transport systems and strong green building codes.

New behaviours and practices (and limitations on consumption generally) align with the imposed conditions, rather than a proactive seeking of more sustainable lifestyles. Smart city information systems provide feedback on consumption levels. Economic identity is defined by: a market where real full costs of all commodities are recognised and priced (‘internalised costs’); citizens embracing careful and moderated consumption for social and environmental well-being; wide social agreement on directions for research and innovation and for high government expenditure on this area and for infrastructure more generally; valuing of collective, community needs over individual interests and greater equity; and growth measured in social prosperity as well as GDP.

**Scenario 3: “Digital Networked Living”**

*Keywords:* Digital; networks; freelance workers; peer-to-peer; creative.

*Scenario end-state description*

This is a low consumption city of dematerialised living. Big business and government have significantly less influence in this city where citizens take an entrepreneurial do-it-yourself approach to making life fulfilling and reducing greenhouse emissions. An 80% reduction in greenhouse gas emissions (on 2014 levels) has been achieved through: a highly diverse renewable electricity system; significantly less consumption of material goods, except for digital technologies necessary for digital living; very low energy use for personal mobility and transport more generally.

Deliberative online collection and sharing of environmental data is part of the democratic spirit. Ad hoc alliances solve problems in a pragmatic way. This is a world where ‘everyone should be an entrepreneur’; the aim is for a nimble and dynamically changing economy. Consumers and producers seek innovative uses of digital and distributed technologies. New businesses are supported by ever changing informal, digitally connected networks. One-person, networked businesses are flourishing. Whilst non-profit social entrepreneurialism is strong, small business is still primarily profit oriented. The form of the city reflects the low transport of material goods; digital networking; the predominance of small businesses; sharing of goods and public space; low per-capita private space (compared to 2014); and building re-use.

**Scenario 4: “Localised Living”**

*Keywords:* Localisation; self-reliance; village style living; wellbeing; decentralisation.

*Scenario end-state description*

This is a city as a mosaic of localised and slow living. It is a city that reflects strong (but diverse) values about the creation of a socially and environmentally meaningful life, acceptance of low levels of consumption and a strong interest in face-to-face community. The 80% reduction on greenhouse emissions has been achieved through a highly diverse system of renewable electricity production, with local and national grids and limited production of biofuels. Consumption of energy (and materials) is low and expected not to rise much with increases in population. Sustainable lifestyles have also reduced transport energy consumption with more localised living and high levels of human powered and electrically-assisted mobility.

The economic identity of the city is characterised by: measures of prosperity that are not related to growth in GDP or material/resource consumption, with a cultural focus on more complex and nuanced measures of human flourishing (with these measures being a regular topic for community debate). Local currencies are common. People and social relationships are valued more than material possessions. A high proportion of overall economic value is derived from creative activities. Working is not seen as critical to identity and a high proportion of the population spends less than five days per week engaged in the formal economy.

These four scenarios can be further characterised and compared in relation to core dimensions such as the main source of emissions reduction and future political economy (see Figure 6).
Figure 6. Characterisation of four scenarios along a selection of dimensions
5. Discussion

As we discuss in detail elsewhere (McGrail et al. 2015), the majority of glimpses are consistent with the increasing emphasis on localised urban sustainability. Large changes to urban form, land-use and building stock are entailed by many of these glimpses, which raises issues about plausibility (see below) and transition pathways. The glimpses also extrapolate emerging forms of technological and social innovation and dramatically convey options and challenges for low-carbon resilient urban cities.

We are yet to assess in-detail the plausibility of the scenarios – both in terms of whether they are realistic (in terms of real-world change) or whether they will achieve the normative targets (e.g. 80% reduction in greenhouse gas emissions on 2013 levels) – so these cannot be commented on here.

What we can point to is two key issues identified by our analysis to-date. First, it has surfaced important trade-offs and related considerations. For example, one PhD researcher’s work highlights the relationships between urban density, urban biodiversity, open space and related potential consequences (e.g. for urban heat island effects). Where such relationships exist, trade-offs may need to be made. Secondly, as our review of roadmaps showed (McGrail 2014) the existing literature poorly considers the interactions between key domains of innovation such as (i) technological innovation, (ii) innovation in the planning, design and management of urban development; and (iii) attitudinal, cultural and behavioural change. Such interactions can be explored through scenarios and should inform the pathways analysis.

Second, the causes and consequences of urban inertia need to be further examined. Many of the experts we interviewed emphasised the inertia in urban environments (e.g. building stock turnover) and viewed 2040 as not far away. This may constrain the amount of change that can be achieved by 2040, unless better interventions for reducing inertia can be identified. It also raises questions about what we should realistically expect from emissions reductions that are sought in cities. We will also need to be sensitive to this issue when attaching quantitative emission figures to the scenarios (see next steps below).

Finally, in addition to suggesting high-level outcomes/end-states, the internal logic of the proto-scenarios
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captures what others have termed governance logics (Foxon et al. 2013) and alternative worldviews (Watson & Freeman, 2012). This aspect is relevant to the upcoming pathways analysis.

6. Conclusions and next steps

As the project is a work-in-progress, it is premature to reach definitive conclusions. What the results to-date convey is some of the emerging aspirations for urban change related to climate change and urban resilience (such as the ideals and ideas embedded in the ‘glimpses’), trends and drivers of change that will influence whether these aspirations are realised, and related possible characteristics of future Australian cities. The results also convey some of the emerging ways that the urban decarbonisation challenge is being grappled with, ranging from the technocratic approaches associated with some ‘smart city’ programs and related policy agendas through to more bottom-up change. To the extent that the scenarios are not mutually-exclusive futures they convey multiple ways of simultaneously tackling this challenge.

The results so far have also reinforced one of the original premises of the project; namely that the complexity of large cities along with the systems that support cities and urban living requires a more systemic approach to envisioning low-carbon and resilient futures for cities. This lesson has implications for the upcoming pathways analysis, such as with respect to the urban inertia challenge.

Next steps

The next phases of the project will involve elaboration and refinement of scenarios including quantitative emissions comparisons, developing policy and innovation pathways, and exploring the governance implications. As part of this, the project will collaborate with the Integrated Carbon Metrics project of the CRC LCL and the Australian Stocks and Flows Framework project to develop estimations of the scenarios’ potentials to reduce emissions. This aims to determine whether these scenarios do indeed have the ability – or what would be required – to reduce city emissions by 80% by 2040.

Subsequent phases will also involve backcasting exercises. This involves more deeply considering potential pathways to low carbon resilient cities, asking what could help bring about these (or other) scenarios or particular desired elements of the scenarios.

References

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