

Article

Citizens' Views of Australia's Future to 2050

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Abstract: In four focus group exercises involving both forecasting and backcasting approaches, we gave approximately 100 Australian citizens the opportunity to discuss likely, desirable and feared futures to 2050. The image they paint is both coherent and consistent. Education, governance, personal attitudes and societal trends, rather than specific events, are drivers of a future which is perceived as being largely shaped by human choices. Innovation is believed to be more necessary in novel social arrangements than in further technology. The most feared futures arise from an amplification of trends already at play in the present: economic growth at the expense of the environment and quality of life, lack of equity, poor government, corporate greed, commercialism and erosion of social values. Economic and material growth does not feature in the most desired futures which are local, inclusive, peaceful, equitable and in some cases frugal. The visions and scenarios developed find a place within established foresight frameworks and global political narratives, but seem to lie at the fringe of current media and short-term political discourse. These results should not be interpreted as representative of the overall Australian population, but suggest that extending the analysis to the broader community could provide significant insights and enrich the discussion of important societal choices.

Keywords: future studies; sustainability; australia's future; future archetypes; narrative analysis; climate change; economic growth

1. Introduction

Someone will think about the future. It had better be us. Imagine that it's 7am, January 1 2050. What world would you be waking up to? What world would you want to wake up to?

With these two headlines we recruited members of the Australian population to a set of focus groups to explore their views about Australia's mid-century future. The first sentence stresses that while 2050 may appear well beyond most people's time range, several organisations have already started addressing this issue [1–13]. The second sentence creates the image of the far away future as a familiar experience and demystifies the aim and approach to the focus groups.

Our motivation was to verify whether the frameworks and narratives commonly used in discussing the future within the political, media and academic circles match the ones used by the general public, or whether they need to be augmented to include a richer and more diverse repertoire. We asked our participants to discuss what alternative paths Australia might take, what are the most desired and most feared futures and to consider what choices might lead to either of them. Our aim was neither to predict the future [14], nor to provide direct policy directions as in the Anticipatory Democracy tradition [15], nor to access disparate sources of knowledge, provide consultation and add depth, breadth and length [16] to a decision-making process via public participation as in the fully-fledged foresight tradition [17]. While we did not plan to foster any specific foresight attitude as in strategic foresight and organizational learning [18], our aim was to learn. We hoped our audience could benefit from the experience, from sharing ideas with other team members, and from the learning which arises from participating in a Futures exercise. In addition, our aim was to observe how a group of citizens go about talking about the future, how they frame the exercise and what narratives they use. For this purpose, we did not provide any background information and we did not define the context of the focus groups. To the best of our abilities, we let the context arise spontaneously from the participants' interests, beliefs and motivations.

Obviously, no human interaction occurs in a vacuum, and can ever be considered independent of context. Context is often implicitly defined by situations, locations, membership and expectations. For example, Andersen *et al.* [19], discussed the impact of national traditions on perceptions of the future and distinguished an English-speaking cluster, which includes Australia, in which a relatively equal society comfortable with uncertainty is better suited than others to discuss long-term futures. Our main results confirm this image of a confident, forward-looking community, able to shape some components of its future. First, our participants see the intersection between governance and education as the main driver determining their future: a better educated public would display more political awareness and participation and would limit the influence of vested interests, via the media, on decision-making. Second, they describe climate change, economic development, health, environmental and economic sustainability and lifestyles as being shaped by human decisions and actions. Third, they see the future as less determined by discrete events, such as technological breakthroughs or conflicts, than by large-scale social trends, which are shaped by human behaviour. Finally, they seem to reject economic growth, at

least in its material form, as a positive force and consequently as a worthwhile long-term future goal. The crucial challenge in determining the future is then seen in the need to move from a status-quo characterised by decision making based on short-term goals, mostly influenced by private and corporate interest to a new system which allows complex decision making to be inclusive, address long-term goals and provide for social equity.

In the next section we describe the cultural and geographical settings in which we ran the focus groups. Next, we introduce the methods used in this work and we summarise the main results. We then proceed with the main contribution of this work, which consists of analysing these results within a unified framework which includes narratives from the foresight tradition, the political sciences and the ecological literature. We notice that while these results fit naturally within this framework, they lie at the periphery of mainstream political and media discourse. This suggests that our participants are both suited to and ready for more sophisticated and diverse political discussions. We then analyse the participants' cognitive signature in order to assess to what extent our audience may differ from an unbiased sample of Australian citizens, and conclude with a general discussion of the overall process.

2. Experimental Section

Between April 2012 and November 2013 we ran four focus groups in different Australian locations: a very large city, Australia's capital city, a medium-side city and a very remote small coastal town. These were chosen to represent different socio-economical and demographic backgrounds:

- (1) Melbourne, with a population of just above 4 million people, is the second largest city in Australia. Here too tensions are explicit. On the one hand, Melbourne is considered Australia's cultural capital, a "garden" city and regularly ranks among the World's most liveable cities. On the other hand, its considerable outward suburban sprawl results in significant social and environmental issues, including large urban footprint, large motor vehicle ownership, high demand for infrastructure and services, and water shortages.
- (2) Canberra (population just below 400,000) is Australia's largest inland city. A fully planned city, it was designed for the specific purpose of being Australia's capital and hosts Australian Parliament and main government bodies. As a result, the city has a high proportion of public servants, lower than average unemployment rate, higher than average income and tertiary education and a fairly young population for Australian standards.
- (3) Hobart, with a population of just above 200,000 people, is the capital of the Australian island state of Tasmania. For several decades, Tasmania has been at the forefront of environmental debates both at a state and national level. On the one hand, it holds large extensions of relatively unspoiled natural environments of great beauty: many of its inhabitants see it as a "natural" state, and it is promoted as an "Island of Inspiration" and "A World Apart, Not A World Away" in terms of tourist destination. On the other hand, much of its economy and employment depend on resource extractions (mining, forestry, energy and fishing). The tension between environmental protection and economic development is an important reality for Hobart's community.
- (4) Exmouth is a small town (population just above 2000) in the North West of Western Australia, located 1200 km from Perth, the closest city. Originally built to service a navy base in the 1960s, Exmouth is the main centre of a region of high tourism visitation due to its exceptional beauty,

which includes the Ningaloo Reef (UNESCO-listed World Heritage Area). At the same time, it is also undergoing a considerable industrial development, largely based around oil and gas extraction, which makes of the region an extraordinary example of the conflicts inherent in jointly managing economic development, tourism, fishery and conservation [20,21].

Australia is considered to be a multicultural nation due to several waves of immigration from all over the world. This diversity is probably not well represented in our focus groups, which included a clear Caucasian majority.

Participants were recruited mostly via local newspaper ads. For Hobart's event, word-of-mouth was also used targeting sporting groups and the contacts amongst the broader community to avoid a bias toward a single sociocultural group. The Canberra event was part of the 2013 "You Are Here" festival [22], and was advertised within the festival program. Fliers were also posted in local public venues. The newspaper ad/flier included the heading presented at the beginning of the Introduction. As an example, the flier used for the Melbourne event can be found at [23]. Each focus group ran for approximately 3 h. Participants were compensated for their effort with a \$50 gift voucher and a light buffet lunch. Several participants provided feedback that the gift voucher and buffet were neither expected nor necessary and were grateful for the opportunity to participate, express their views and be exposed to the opinions of other participants. The anonymous, post-workshop feedback forms returned mostly positive comments.

Each focus group was carried out by subdividing the team into Subgroups of 5–10 people. Each group was then assigned one of the tasks described in the next section. The tasks were designed to be carried out as a team, allowing for discussions and brainstorming, although no explicit request for agreement or consensus was given and it was explicitly stated in the introduction that there were no "right answers". Participants were also encouraged to respect each other's views (by not trying to silence them) even if they differed from their own views.

3. Results and Discussion

During the workshops we carried out two exercises, Future Forward and Future Backward, as described below and summarized in Table 1.

3.1. Future Backwards

While it can be hard to assess the likelihood of different futures, it is easier to describe what we would or wouldn't like out of the future. The Future Backwards approach helps explore these extremes and builds largely on the backcasting tradition [24,25]. This exercise was run in two different ways. In Hobart and Melbourne the participants were divided into two groups and one group was asked to carry out the Future Backward exercise. First, responders were asked to define their visions of Utopia and Apocalypse. We imposed no requirement for common agreement within the group on these visions, nor did we require the visions to be constrained by self-consistency or likelihood of occurrence. Next, participants were asked to consider the current state of Australia and discuss what past events and trends contributed to it. The purpose of this step was to draw attention to the inevitable relations existing between past, present and future. Lastly, possible pathways to utopia or apocalypse were mapped out.

Table 1. Description and purpose of the Future Forward and Future Backward approach.

Future Forwards		Future Backwards	
Aim	Develop Future Scenarios	Identify the Most Desired and the Most Feared Futures	
Task	1. Consider the main issues and processes at play today 2. Identify five scenarios of possible future development 3. Project these five scenarios forward in time a decade at a time 4. Present possible final outcomes for each scenario	1. List the characteristics of an unwanted future: “apocalypse”. 2. List the characteristics of an ideal future: “utopia”. 3. List the characteristics of our current existence: “now”. 4. Identify key events in our past that have led to our current state. 5. Identify possible future events that could lead to “apocalypse”. 6. Identify possible future events that could lead to “utopia”.	
Assumptions	1. Time naturally flows forward 2. Some events occur unplanned and spontaneously 3. Some events are the consequence of choices and events occurring in the past, whose significance is appreciated only in hindsight 4. Society tends to adapt and react, rather than consciously plan and anticipate.	1. Time naturally flows forward but humans can also mentally run time backward and consider counterfactuals 2. The future can be the result of conscious planning 3. We can employ a reverse-engineering or scientific approach to understand the drivers of possible desired or undesired future events 4. Once understood, we can act on those drivers	

Due to constraints on the shape and acoustic properties of the venue in Canberra and attendance numbers in Exmouth, the participants could not be split into two groups. Here, all participants were asked to describe their views of Utopia and Apocalypse on sticky notes posted on the walls.

The versions of Utopia and Apocalypse (see Figure 1) were very similar in all locations. They also largely match lists provided by people of other cultures [24,25]. They reflect humanity’s universal desire for a safe and secure future. Most important, they closely match the visions collected via the online survey among a representative sample of the Australia population [26,27]. Some minor differences could be detected between different locations, with Hobart placing more emphasis on the ecological aspects of both Utopia and Apocalypse.

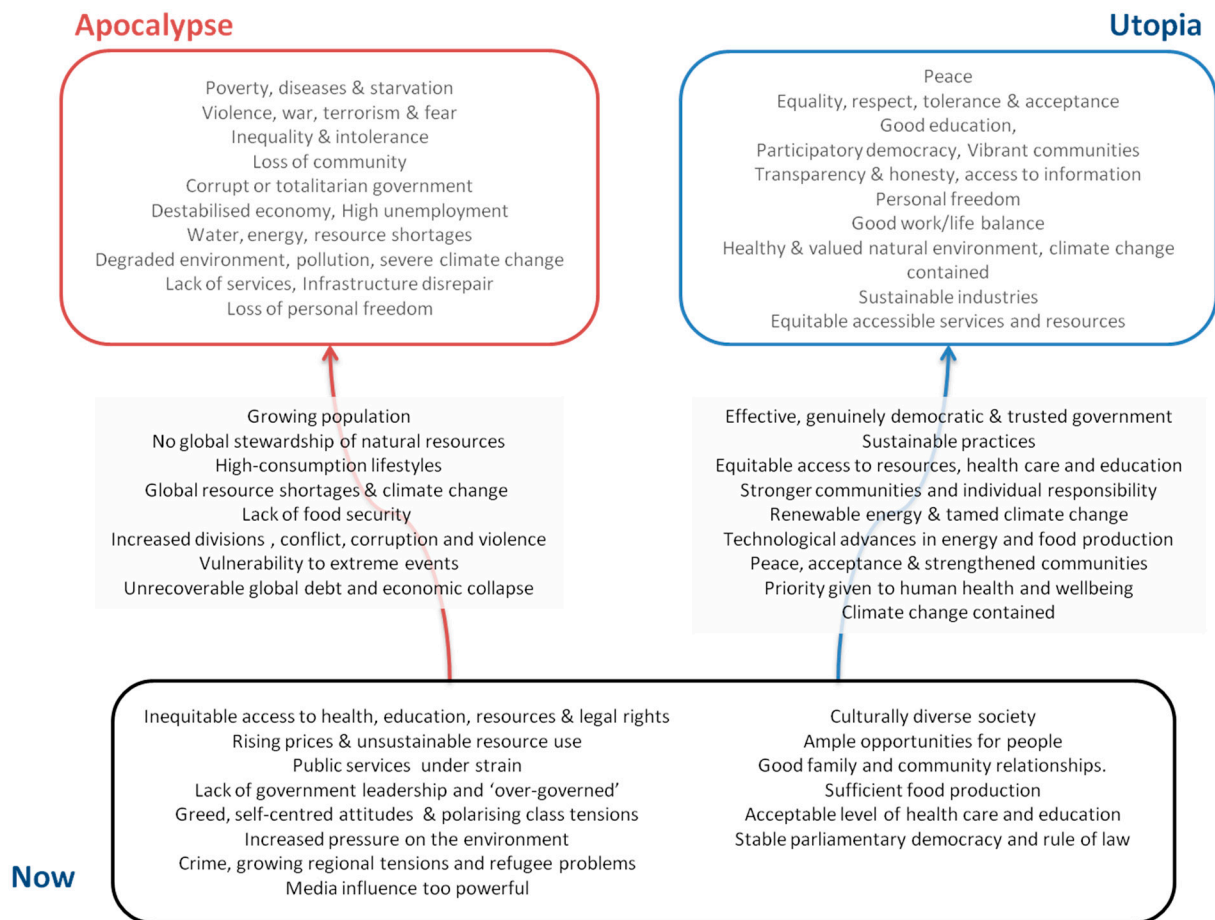


Figure 1. Description of current state of Australia Society (Now), Utopia, Apocalypse and possible paths leading to them.

Figure 1 shows a considerable amount of structure in the narratives expressed in the Future Backwards exercise. Despite the lack of requirements for agreement or physical plausibility, most of the characteristics and events described in the Apocalypse and Utopia are already present in the description of Australia current state (“Now”). The future Utopia or Apocalypse are described as sharper or more extreme versions of Now, rather than completely novel states. Effective government, sustainable practises, community focus and equitable decision making are seen as avenues which can enhance the positive aspects of Now and lead to Utopia. Growing population, ineffective government, consumption-driven lifestyle and poor environmental stewardship are seen as paths enhancing the negative aspects of Now, leading to Apocalypse. Throughout the workshop, the latter processes were often identified as “business as usual”, suggesting that current dynamics are seen as unhelpful and need reversing if considerable future deterioration is to be avoided.

We noticed a lack of symmetry in how the participants viewed the past and the future. In reviewing the past, participants identified (i) social movements and trends (the end of feudalism, increase in public education and women’s rights, decrease in consumption of locally produced food, increase in media influence on society, and increased global trade and communication); (ii) specific events (e.g., World Wars, Great Depression); (iii) inventions (fire, wheel, printing press, medical discoveries, industrial revolution, car, aeroplanes, cinema, television, communication devices, internet); and (iv) specific people (e.g., Hitler, Churchill and Henry Ford) which led to dramatic and possibly unforeseeable

changes. On the contrary, events, inventions and people are mostly absent from narratives about the future. These focus on social trends, most of which are already in existence (largely based on social equity and the natural environment, “continuing development of weapons of mass destruction”, “faster development of renewable energy”), societal values (e.g., “people want more wealth” or “tolerance for others’ beliefs” or “stronger focus on community”) or value judgments (“too much corporate greed” or “cars take up too much space”). In the few instances where specific triggering events were named, these involved Apocalypse but were largely absent in descriptions of what would take us from today’s society to Utopia.

3.2. Future Forwards

An alternative way to think about the futures is to step forward through time. After dividing the Future Forward team in 4–5 groups, we asked each group to imagine standing at the beginning of each decade up to 2050, and consider how that decade may unfold, what processes might be important and what significant event may occur. These discussions and the key issues they identified were then woven into a story of how the future may unfold, which in the rest of the document we label as scenarios. In some cases this last step was carried out by the participants’ group itself, other times by the authors during the post-workshop analysis, by examining the written material produced by the participants as well as the notes taken by the authors. These scenarios are listed in Supplementary material; each is labelled with a letter identifying the city it originates from and a number (e.g., M3 = third scenario from Melbourne’s workshop).

Some specific scenario themes and messages were specific to individual locations:

- (1) “Small is beautiful”, both in terms of (local) governance, business development, family and community caring is the strongest message arising from Hobart.
- (2) While governance is central to all scenarios, it was felt as particularly crucial among the participants in Melbourne.
- (3) Societal attitudes and the role of tipping points were frequently discussed in Canberra.
- (4) The ethical imperative and implications of education regarding responsibilities, not just rights, were felt strongly in Exmouth.

However, the similarity of the main themes characterising the ensemble of scenarios developed by all teams far overweighs the local difference. These include energy, the economy, the environment and climate change, governance, education, technology, population and aging, with extreme events, wars or nuclear catastrophes, discussed to a lesser extent.

4. Analysis: Interpreting Our Results within Common Narratives and Frameworks

In this section we try to cast the results of the exercises described in the previous section within established foresight frameworks and global political narratives. We begin by describing the frameworks and narratives which we believe are most suitable to this purpose.

Discussions about the future can be framed within very different contexts. If the aim is prediction, forecast or projections, different approaches are available based on formal modelling, trend extrapolations, probabilistic approaches and expert opinions [28–36]. Guessing what the future may bring was not the

primary scope of this study and as a result we did not take this direction. Rather, we aimed to explore aspirations, expectations, opinions, hopes and fears about possible futures, the most common motives which lead people to future studies [32]. A number of concepts relate to our purpose. The Time Perspective [37–39], Socio Emotional Selectivity theory [40], Time Construal literature [41,42] and Episodic Future Thought [43], among others [44], address these in terms of individual attitudes towards the past, the present and the future, how these relate to personality types and how they affect individual decision making and behaviour. A discussion on how propensities at an individual level can affect participation in Future Studies is also found in [45]. For a different literature, anticipating the future is a defining feature of life and a crucial component of human cognitive abilities [33,46–50]. In all these studies, the focus is on the individual and to a lesser extent on communities and social contexts. Analysis of future attitudes in terms of national identities and shared narratives about the past is found in [19,51,52]. The focus here is on entire nations or a racial identities. These focuses are either too narrow or not narrow enough for our purposes given that our focus groups ranged between 10 and 50 people in size and were influenced by local as much as national concerns.

Within a social-cognition framework, a different literature has focussed on the ideological polarisation currently characterising many developed democracies [53–72]. Most of this work has been carried out within English-speaking countries and is particularly suitable to the Australia setting [19,73,74]. It tends to see individual preferences towards economic management, government style, environmental protection, crime control and moral stands as highly clustered and closely related to ideological stances. It is suggested that these stances and preferences are often chosen to address the individual's needs and to define and reinforce its role within its own social group and social reality. This framework is well suited to our study because, as we will see, governance, environment, ethics and community values are the main issues discussed in our focus groups.

It is important to note that the polarisation this literature discusses is identified experimentally. At one extreme, it describes a market-centric ideology which gives priority to economic growth over other concerns. The narratives of this ideology are firmly based on right-wing beliefs, according to which competition fosters ingenuity and productivity, wealth improves human conditions, wealth inequality drives healthy competition, Nature's role is to support human life, technology enables mankind to overcome most hurdles and communities flourish when individual liberties are fostered. At the other extreme, an eco-centric ideology emphasises the role of mankind within Nature, sees Nature as deserving protection for its own intrinsic value and gives priority to sustainability over economic growth. The narratives of this ideology see competition as fostering greed and selfishness, wealth as just one among many contributors to "a good life", technology as a source of some good and potentially unlimited harm, mankind's potential constrained by clear natural boundaries and individuals flourishing when community strength is fostered.

Naturally, only a minority of people identifies with either extreme, while the majority lies somewhere in a continuum between the two. Even among conservationists, for example, market instruments are not necessarily always seen as antagonistic to environmental concerns [75–78].

Differences can be quite nuanced. By employing a discourse and narrative analysis framework [79–81] to explore the eco-centric side of this continuum, [81] reviewed and summarised a number of approaches proposed by both governmental organisations, NGOs and academic institutes to address the relation

between economic development and ecological sustainability. These include, among others, Green Growth, Green Economy, Green New Deal, Steady State Economy and De-Growth, defined as follows.

- **Green Growth** means fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. To do this, it must catalyse investment and innovation which will underpin sustained growth and give rise to new economic opportunities [82]. It emphasises growth via “Incentives for greater efficiency in the use of resources and natural assets: enhancing productivity, reducing waste and energy consumption and making resources available to highest value use”, as well as via innovation, new markets and policy interventions. It is often described as a win-win solution to the challenge of aligning economic growth and environmental sustainability.
- **Green Economy** aim to achieve “improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities”. “In its simplest expression, a green economy is low-carbon, resource efficient, and socially inclusive. In a green economy, growth in income and employment are driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services” [83]. It also envisages growth, but places emphasis on social inclusiveness and respect for future generations.
- **Green New Deal** is defined slightly differently by different sources [84–87] but overall, drawing a parallel between the Great Depression and the GFC, envisages government intervention to address both economic and ecological crises and regulation to limit the influence of the financial sector over the economy.
- **Steady State Economy** “is an economy of relatively stable size. It features stable population and stable consumption that remain at or below carrying capacity” [88]. Its roots are based in the Ecological Economics literature [89] and an entropic view of the economy in terms of natural constraints, energy flows and waste generation [90–93]. It aims to give a strong physical and economic rationale to the principle that constant growth is not possible in a finite world [89,90,94–98].
- **De-Growth** takes the concept of Steady State Economy one step further and proposes a conscious, planned and willing reduction of global economic activities [99–102]. It is usually argued for along three lines of reasoning: (i) natural limits to growth and the planet’s carrying capacity have already been surpassed so a reduction in economic activities is needed to re-establish balance; (ii) natural limits may not have been surpassed yet, but inevitably soon they will and a planned and conscious de-growth is more desirable than an unplanned costly decline or collapse [103] and (iii) currently the cost of maintaining the status-quo far outweighs the benefits in terms of quality of life [98,99,104–106]. The implications of aiming at de-growth are far reaching [100,107–109] and often associated with vast societal transformation towards more democratic, locally focussed communities and a rejection of capitalist beliefs. As a result, this narrative is often seen as utopian and so extreme to lie largely beyond the mainstream political discourse.

The above narratives address ecological sustainability and eco-centric sentiments. At the other end of the spectrum, market-centric narratives capture the belief that market forces and innovation can provide

for continuous economic growth even in a world of finite resources. They extrapolate over a human history of development and innovations which are seen as having always been able to push natural boundaries beyond what were seen to be natural limits. As it is for eco-centric narratives, market-centric narratives also come in various descriptions, of which [110] provides a careful analysis. Particularly relevant to our work is the distinction between (i) (traditional) liberalism; (2) free-market liberalism and (iii) neo-liberalism, which rests on the relation between markets and governance:

- **(traditional) Liberalism** sees markets as natural to human relations. It also sees markets as naturally imperfect. As a result, this narrative identifies a role for government in the economy. This role may be accepted with suspicion, but is nevertheless seen as necessary to address market failures and ensure the markets' efficient functioning for the good of society.
- **Free-Market** goes a step further. If markets are natural to human relations, then interfering with them is unnatural and thus should be carried out as little as possible. This leads to a more sceptical outlook of government intervention. Not only is government interference with the market unwarranted, but also it can be counterproductive since not even the best intentioned government can deal with the complexity arising from the immensely vast network of economic relations, which a market, via its decentralised nature is in a better position to address.
- **Neo-Liberalism** is less concerned with seeing markets as natural to human relations, than with market as instruments for governance. Government is not seen as possible source of interference, rather as an avenue through which markets can be created. This includes the creation of markets in areas traditionally not seen as subject to market relations, including policy and social problems and failures in the very same markets [111]. Markets are thus seen as instruments for governance, rather than social relations subjected to governance. Particularly relevant to this analysis, [110] sees the introduction of market-based instruments to address environmental problems, including cap-and-trade schemes, as one early example of the use of markets as policy solution to a social problem. This is not unlike the incentives mentioned in the description of Green Growth above. It highlights that it is not the use of markets per se which differentiates some of these narratives, rather the role and priority the markets are given in relation to environmental and social issues.

Finally, we combine into a further narrative various views of societal Collapse, due to either military, economic, social or ecological drivers, often seen as inexorably linked to the civilisation natural cycles [112].

The above list is obviously skewed: narratives of the left side of the political ideologies outnumber the ones on the right. To the authors' knowledge and own analysis, this reflects a bias in the futures studies, cognitive science and ecological literature. This bias has two facets. First, left-wing/eco-centric are more nuanced (see for example [79] for a very detailed classification). Second, in the literature, right-wing narratives are most often described by left-wing writers and consequently mostly described in negative and possibly biased terms. This may be a consequence of a preponderance of left-wing views in academic circles [113]. Balancing this distribution was beyond the scope of this work, but is probably a worthwhile effort for future analysis.

In a different approach, the foresight literature has also proposed a number of frameworks to analyse and develop future scenarios. The need to manage the combinatorial explosion in the number of

scenarios which may arise from concurrently addressing several issues and drivers has led many teams to adopt the double uncertainty, grid or 2×2 matrix approach [9,45,114–117], in which the two most important or most uncertain issues under analysis define the axes of a 2D futures' plane in which the resulting four quadrants provide alternative paths to explore. A different, but somehow related, approach relies on the observation that different teams dealing with different foresight questions even in different cultural contexts often converge towards a small number of themes, or future “archetypes” [9,11,115–129]. In applied foresight exercises, often these archetypes are plotted on a 2×2 plane or may naturally emerge from the choice of the double uncertainty axis, which results in a certain overlap between the archetypes and grid approaches [4–6,9,12,13,123,130–132].

In this work we borrow extensively from the archetype framework described in [124], which draws on the reviews by [119,128]. The archetypes there described are good representatives of several similar choices available in the literature [119,128,129,133–135]. For visualisation purpose the original authors plotted these archetypes on a 2×2 plane, but avoided the potentially ambiguous task of assigning meaning to the axes. We follow the same approach and adopt four archetypes:

- **Growth** represents a “business as usual” world with globalisation and free trade as major forces under the premise of possible continuous economic growth.
- **Restraint**, highlights the government role in oversighting economic and environmental priorities, which can emerge either top-down or bottom up. Social, environmental and economic concerns are given comparable attention.
- **Transformation** envisages a very different future, as a result of technological, environmental, moral or social forces, or a combination of them.
- **Decline** sees our civilisation approaching some kind of breaking point, as a result of environmental, social or moral stresses. Some serious, possibly painful, adjustment will have to happen before further development is possible. This archetype was referred to as “Catastrophe” in [124].

If, as the literature suggests, these archetypes do cover the range of futures likely to arise in a foresight study, then we should expect they also encompass the narratives describing the most common political ideologies, since these are meant to be about preferred ways to construct and adapt to the future. We make this explicit by mapping the ideological narratives described above into an archetype plot similar to [124]. In Figure 2 we follow [124] by not labelling the axes of this abstract space, but respect the spatial ordering of the archetypes. Over this space, we add a growth gradient (blue to maroon background) where maroon represents economic decline, blue economic growth and white a stable economy. Naturally, the Continued Growth archetype maps into economic growth while the Decline archetype maps into economic decline. However, the Transformation and Discipline archetypes are orthogonal to this gradient. Both can be conceived in a growth, decline or stable economy settings.

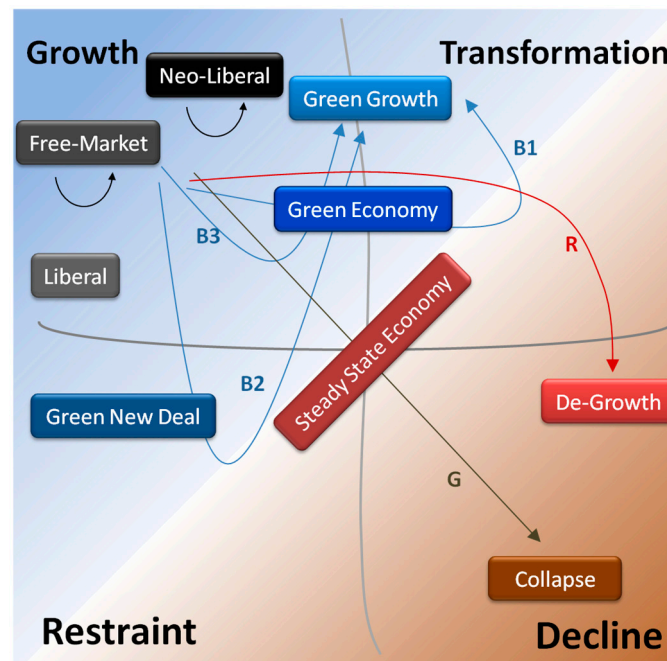


Figure 2. Narratives about relationship between economic growth and environmental sustainability, mapped into the futures archetypes space. Narratives may or may not result in their implementation. Similarly, transitions may or may not eventuate. As a result a scenario (an arrow) crossing a narrative (text box) in the figure does not necessarily imply that these may co-occur.

In addition, Figure 2 allows us to capture how the narratives evolve in time. For example, the blue arrows show how Green Growth could achieve its desired win-win goal of economic growth and ecological sustainability via technological transformation (B1), government intervention (B2) or market forces (B3). Similar paths can be imagined for the Green Economy and possibly the Stable State Economy, while the Green New Deal is more clearly driven by regulation and discipline. Collapse and De-Growth both imply the Decline archetype, but via a very different paths: Collapse occurs via undesired crisis and failure (arrow G in Figure 2), De-Growth occurs via sought after social and political transformation (arrow R).

In Figure 3 we superimpose the outcomes from both the Future Forward and Future Backward exercises into the archetypes space. The “story” embedded in each scenario from the Future Forward exercise is visualised via an arrow, where a dark circle represents Now, the arrow point represents Australia in 2050 and the path summarises how the story unfolds. We can make a few observations:

- (1) As mentioned above, “Now” includes many negative aspects. For some this is the result of too much emphasis on economic growth and wealth inequality, for others of too much regulation or both. This is to be expected since the dilemma between too little and too much governance characterises much of the current political discourse.
- (2) The stories describing collapse tell of a smooth linear deterioration by exacerbating the negative trends already in action now.
- (3) Several stories leading to a positive future tell of a transition period and possible turmoil, which happens either via government intervention (M2, E3), via experiencing decline (H4, H5) or via

deep social transformation (H2, H3). Others describe a more smooth transition leading either to better government or social transformation.

- (4) No story envisages material growth or business-as-usual economic growth. The very few stories which mention growth relate this to desire for equity and full employment. All other stories either do not mention growth, or imply no growth and possibly de-growth.

As we should expect, the outcome of the Future Backward exercise amplifies these “stories”. Particularly noticeable is that Utopia includes no mention of economic growth, material growth or material concerns in general. Utopia is about balance (between humans and Nature, in work-life, in wealth distribution and equity), peace, respect and education. Aristotle would be proud of our participants [136,137].

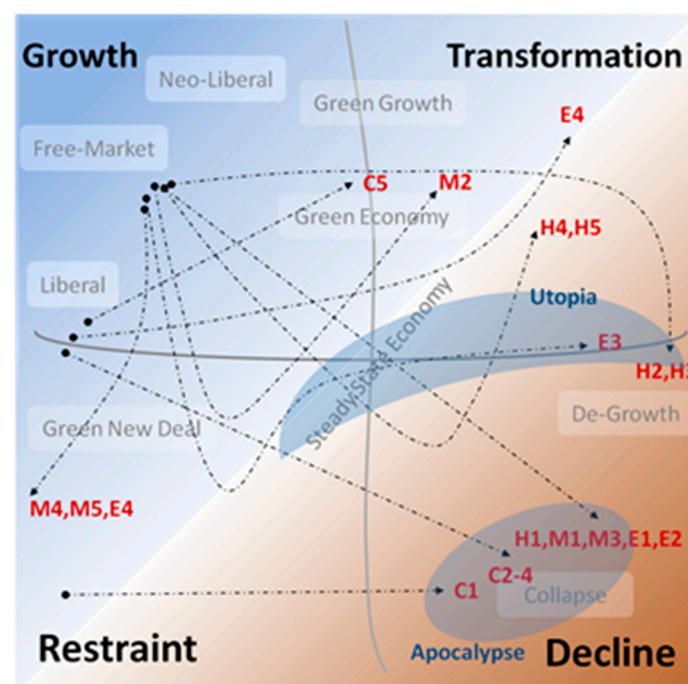


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5. Participants' Cognitive Signature

While both the scenarios and descriptions of Utopia and Apocalypse are consistent with the archetypes and narratives described above and find a natural place in the archetype map, it is considerably harder to fit them within mainstream media and political discourses, in which the desire for economic growth is rarely questioned. This leads us to ask (i) whether our participants are representative of the Australian population; (ii) whether some bias could have been at play in the way we ran the focus groups and (iii) whether people might behave differently in a focus group to how they behave when asked to express their preferences by voting or spending choices.

The participants were volunteers recruited via newspaper advertisements and fliers rather than members of an unbiased sample of the Australian population. It is possible that the knowledge that the focus groups were run by research scientists from a large government research institute may have affected both the participant selection and the focus groups dynamics. Also the team-based approach used in both the Future Forward and Future Backward exercises may have led to more communitarian outcomes (as envisioned in [138]) than if we had asked our participants to work in isolation or via online surveys [139] (Leviston, personal communication). In addition, it is possible that the opening statements in the flier used for recruitment (the first lines in the Introduction of this paper), which imply a moral imperative to do something about the future, tolerance of uncertainty and openness to change, would be more appealing to individuals with progressive political orientation (Price, personal communication).

In order to further explore these issues, we asked some participants to answer the questionnaire described in [140], which was designed to sketch an individual's cognitive signature, by exploring political attitudes, worldviews and other cognitive constructs. Only the participants willing to be contacted as follow up to the focus groups were asked to respond to the survey. Of these, only 24 completed the questionnaire. We then compared their responses with the ones from 290 responders chosen as a representative sample of the Australian population [26]. The results of this comparison are shown in the Supplementary Material (Cognitive signatures analysis).

The questionnaire included 11 cognitive constructs: Need for Closure and Cognition, Attitude towards Risk and Uncertainty, Myths of Nature (Elastic and Ductile), Social Dominance Orientation, Right-Wing Authoritarianism, Time Perspective, Attitude towards Science and Environmentalism. A description of each constructs can be found in [140]. It also included questions about political orientation, climate beliefs, expectations about Australian future, trust in institutions, environment commitment and some basic demographics.

Among the constructs, four show statistically significant differences (see table in the Supplementary Material). Our participants display lower Need for Closure [141] than the larger Australian sample. Need for Closure is defined as “the desire for a definite answer on some topic, any answer as opposed to confusion and ambiguity” [142]. In general, people low in Need for Closure are more willing to re-evaluate their views [143]. Nevertheless, no difference was found in the related concept of ‘Need for Cognition’ [144] described either as “a need to structure relevant situations in meaningful, integrated ways”, “a need to understand and make reasonable the experiential world” [145] or more intuitively as enjoying thinking, a “quest for reality” [146], a “need to understand” [147]. Need for Cognition correlates with “positive” thinking dispositions, IQ and a preference for complex vs. simple cognitive tasks [144] and our participants did not display significant difference compared to the rest of the population. In other words, while the focus group participants appear to be slightly more open-minded, they do not appear to display a preference for a deeper or more complex approach to the issues we discussed, compared to the rest of the nation. They are less likely to believe that Nature is able to recover from human impacts and stressors (Nature Elastic in [148]). They are less authoritarian (lower Right-Wing Authoritarianism [149,150]), but show no differences on other measure of political beliefs (Social Dominance Orientation [65]) or affiliation [26]. They are more likely to believe that climate change is anthropogenic (we used measures from [74]). They show no difference in attitudes towards Science [140], Risk [151], Uncertainty [152], the environment [140]. Finally we did not find

significant differences in levels of trust in local and federal Government, family, community and News [140], but display less trust in Scientists and Environmental Organisations.

For what regards specific attitudes towards the Future, our participants differ in the Consideration of Future Consequences [153] and belief that Australia will be safer in 2050 [51]. The average score for these two measures are similar but our participants display more extreme values. They are more likely to believe that Australia will be more honest but show no difference compared to the general population in beliefs that Australia will be more friendly, wealthy and skilled in 2050 [51].

On demographic measures, the balance between male and female was even, but our participants tended to be older and better educated than the average age of citizens included in the national survey.

The statistically significant differences do not portrait an unequivocal picture. While our participants are stronger climate change believers on average and are more doubtful of Nature being able to sustain human pressures, other measures of attitude towards the environment show no difference. While our participants seem to be slightly more open-minded on average, this is compensated by lack of difference in related measures like desire for knowledge and attitudes towards uncertainty and risk. While they are less authoritarian, the other measures of political attitude show no difference. A similarly unclear message comes from the set of constructs related to the future. To what extent age and education affect choices and decision making independently of cognitive constructs is currently under debate [59,154,155].

Clearly this analysis is largely inconclusive. In addition, the number of focus groups participants who answered the questionnaire was very low (24) not only in comparison to the Australia sample (290) but also in comparison to the overall number of focus groups participants (128). As a result, the question we formulated at the beginning of this section (whether the differences in views expressed in our focus groups compared to mainstream media and political discourses are due to the focus group participants or to the nature of the focus group activities) is left answered. What the tentative results discussed in the section suggest is that we should not necessarily assume that the views expressed at the focus groups come from an unusual combination of self-selected individuals and that employing the survey we described in a larger number of focus group activities of this type may provide valuable information. On the other hand, it is also possible that the ‘communitarian’ setting implied in how we ran the focus group may have influenced the outcome and this also requires experimental validation.

6. General Discussion

During the focus groups a few of the participants showed a considerable awareness of the issues under discussion. Some, unprompted, made use of a vocabulary which displayed a high level of knowledge in these matters. On the other hand, many found the Future Forward and Future Backward exercises challenging in ways which suggest they had rarely, if ever, considered time spans beyond one or two decades. In the Future Forward exercises all groups struggled past 2030 and some did so sooner. To our knowledge, few had experience with scenario building. They were given very little instruction, no definite direction to follow and no requirement for consensus or consistency. Nevertheless, in the end all scenarios, as well as the descriptions of Apocalypse and Utopia, are meaningful, (in our opinion) consistent with previously published scenarios, interesting and provocative.

The foresight literature has proposed a number of criteria to assess the quality of a scenario or of a future study in general [156]. In [124] these are summarised in terms of Plausibility, Consistency,

Utility/Relevance, Challenge/Novelty and Differentiation. On a similar line [118] ask for Pertinence, Coherency, Likelihood, Importance, and Transparency and [157] emphasizes Plausibility within a fairly rigorous causal framework, not only in a scenario outcome but also in its storyline. The relative ease with which we have been able to cast the scenarios and descriptions of Apocalypse and Utopia within established frameworks, suggests that the Plausibility, Consistency, and Coherency criteria may be satisfied or at least may be considered as credible building blocks for more detailed alternative futures. The Likelihood criterion is of course much harder to assess but the picture of Apocalypse as a continuation of current trends may indicate what set of scenarios the participants see as more likely. We suggest that Utility/Relevance, Pertinence and Importance, are also satisfied since the scenarios address issues of clear political, social, ecological and social significance. Differentiation is clearly displayed in Figure 3. Less clear is the evaluation of the Challenge/Novelty criterion. On the one hand, we did not hear much novelty: no new religion, no new political ideology, no not-yet-thought technology, no not-yet-experienced social or economic arrangement and little mention of already-developed science-fiction ideas. Even Utopia and Apocalypse look remarkably plausible. On the other hand, both Utopia and the scenarios which lead to it are so far from current media and political debate to look indeed “utopian”. We like to see the Challenge/Novelty criterion satisfied in this very observation.

One of our original intents in using both the Future Forward and Future Backward approaches was to test their effectiveness for possible later use. While conceptually the two approaches are similar, our experience is that they engage different mental processes and abilities and as a result are somehow complementary. We assigned the participants randomly to either of them. Some participants in the Future Forward exercises found it challenging to progress in time from today along anything but a business-as-usual path. The ones who explored alternatives found it very hard to cross the 2030 threshold. Some participants working on the Future Backward found it difficult to “go backward in time”, with a minority being unable to. Among the few individuals who swapped exercises, some found the new task easier to contribute to.

Both Future Forward and Future Backward approaches contributed to the powerful image of human choices and actions being the primary influence on the future, to the extent that the participants see mismanagement as the most likely driver of even events which are historically interpreted as externally imposed, like wars and pandemics. We have become accustomed to acknowledging the ubiquitous impact of human actions at a planetary level as captured by the concept of Anthropocene [156,158–160], an era during which human *actions* have impacts of magnitude comparable to biogeochemical processes of the Earth system. This study seems to go one step further, emphasising the awareness that human thought, knowledge and social relations are the ultimate drivers of such impacts. This is an image of *ideas* as a powerful force of change to the Earth system, an image not explicitly suggested, but inspired by the participants’ responses.

This picture also reflects a very clear distinction between “positive” and “negative” forces. According to the majority of our participants positive forces include equity, community, sharing, and acting locally mindful of long-term global consequences, while, in their view, negative forces include selfish short-term interests, corporate power dominating more diverse interests, and structures that reinforce unequal opportunities. [79–81] highlight not only the importance of narratives in social and political discourses, but also of stories with subjects, objects and causal explanations. We have all of them in our stories, including the good and the bad characters.

The belief in mankind's power to influence Nature brings both optimism and pessimism. Optimism arises from the awareness that humans are not powerless victims at the mercy of events. Pessimism arises from the power of the perceived drivers of current social processes: the media, economic and power interests and greed. A paradox is lurking here; while humanity may be the dominant influence shaping Nature and the environment, it appears much less in control of its own social forces, leading some workshop participants to fatalism.

7. Conclusions

Win-win solutions to complex problems are as unlikely as they are appealing. Neo-Liberalism provides a win-win rhetoric: economic growth will make everyone wealthier and wealth will provide the means to solve socio-ecological problems otherwise too costly to address. Everyone, as well as the environment, will be better off. Green Growth provides another win-win rhetoric: innovation, energy efficiencies and best practices will provide for both economic growth and ecological sustainability. It is often argued (see [81] and references within) that Green Economy, Green New Deal, Steady State Economy and some versions of De-Growth have less appeal because their message is more complex and they imply hard choices rather than win-win solutions.

Some participants in our focus groups also favour a win-win solution to current complex problems but one which is closer to an alternative version of De-Growth. Relinquishing a quest for economic growth and material consumption will both protect the environment *and* make us happier, by focussing our energies on deeper human values, social relations and work-life balance. This utopia may not need technological advances or violent revolutions, but new social arrangements and innovations in how these goals can be pursued.

This work did not aim to explore the technical feasibility or likelihood of different futures, but to learn what futures currently live in the minds of some Australia citizens. It suggests that extending this work to a broader audience may lead to significant insights which, as is often the case, can reveal as much about future desires as about attitudes towards the present.

Supplementary Materials

Supplementary materials can be accessed at: <http://www.mdpi.com/2071-1050/7/1/222/s1>.

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Conflicts of Interest

The authors declare no conflict of interest.

References

1. Australian Government. *Australia to 2050: Future Challenges*; Commonwealth of Australia: Canberra, Australia, 2010.
2. Coates, J.F. Energy needs, choices, and possibilities, scenarios to 2050. *Technol. Forecast. Soc. Chang.* **2002**, *69*, 527–531.
3. Copley, G. *Australia 2050: An Examination of Australia's Condition, Outlook, and Options for the First Half of the 21st Century*; Sid Harta Publishers: Glen Waverley, Australia, 2007.
4. FAO. How to Feed the World In 2050. In *Technical Meeting of Experts on How to Feed the World 2050*; FAO: Roma, Italy, 2009.
5. Fouré, J.; Bénassy-Quéré, A.; Fontagné, L. *The Great Shift: Macroeconomic Projections for the World Economy at the 2050 Horizon*; CEPII: Paris, France 2010.
6. HSBC Global Connections. *The World in 2050: Quantifying the Shift in the Global Economy*; HSBC: London, UK, 2011.
7. Odegard, I.Y.R.; van der Voet, E. The future of food—Scenarios and the effect on natural resource use in agriculture in 2050. *Ecol. Econ.* **2014**, *97*, 51–59.
8. Organisation for Economic Co-operation and Development; SourceOECD (Online service). In *Oecd Environmental Outlook to 2050: The Consequences of Inaction*; OECD Publishing: Paris, France, 2012.
9. Pinnegar, J.; Viner, D.; Hadley, D.; Sye, S.; Berkhouf, F.; Simpson, M. *Alternative Future Scenarios for Marine Ecosystems*; The University of East Anglia: Norwich, UK, 2006.
10. Economics, P.C. *World in 2050, the Brics and Beyond: Prospects, Challenges and Opportunities*; PricewaterhouseCoopers: London, UK, 2013.
11. Grundy, P. *Shell Energy Scenarios to 2050*; Shell International BV: The Hague, The Netherlands, 2008.
12. Staniford, S. Food to 2050. Available online: <http://www.theoildrum.com/node/3702> (accessed on 19 December 2014).
13. Weirauch, W. Energy scenarios to 2050. *Hydrocarb. Process.* **2008**, *87*, 7.
14. Henshel, R.L. Sociology and social-forecasting. *Annu. Rev. Sociol.* **1982**, *8*, 57–79.
15. Bezold, C. Anticipatory democracy revisited. *Democr. Futur.* **2006**, 38–51.
16. Conway, M. Strategic Thinking: What it is and How to Do it. Available online: http://www.researchgate.net/publication/253238955_Strategic_Thinking_what_it_is_and_how_to_do_it (accessed on 22 December 2014).
17. Miles, I. The development of technology foresight: A review. *Technol. Forecast. Soc. Chang.* **2010**, *77*, 1448–1456.
18. Bootz, J.-P. Strategic foresight and organizational learning: A survey and critical analysis. *Technol. Forecast. Soc. Chang.* **2010**, *77*, 1588–1594.
19. Andersen, P.D.; Rasmussen, L.B. The impact of national traditions and cultures on national foresight processes. *Futures* **2014**, *59*, 5–17.
20. Fulton, E.; Jones, T.; Boschetti, F.; Chapman, K.; Little, R.; Syme, G.; Dzidic, P.; Gorton, B.; Sporic, M.; de la Mare, W. Assessing the impact of stakeholder engagement in management strategy evaluation. *IJEME* **2013**, *3*, 82–98.

21. Fulton, E.; Gray, R.; Sporcic, M.; Scott, R.; Little, R.; Hepburn, M.; Gorton, B.; Hatfield, B.; Fuller, M.; Jones, T.; *et al.* *Adaptive Futures for Ningaloo*; Ningaloo Collaboration Cluster: Perth, Australia, 2011.
22. You Are Here Canberra Inc. You are here. Available online: <http://youareherecanberra.com.au> (accessed on 22 December 2014).
23. Boschetti, F.; Fulton, B.; Grigg, N.J. Australia 2050 melbourne. Available online: <http://www.per.marine.csiro.au/staff/Fabio.Boschetti/A2050Melbourne.pdf> (accessed on 22 December 2014).
24. Bosselmann, K.; Engel, J.R. *The Earth Charter: A Framework for Global Governance*; KIT Publishers: Amsterdam, The Netherlands, 2010; p. 275.
25. Schwartz, S.H. An overview of the schwartz theory of basic values. *Online Read. Psychol. Cult.* **2012**, 2, Article 11.
26. Boschetti, F.; Richert, C.; Kitto, K.; Walker, I. Cognitive constructs and environmental attitudes. **2014**, unpublished work.
27. Kitto, K.; Sonnenburg, L.; Boschetti, F.; Walker, I. Modelling attitudes to climate change—An order effect and a test between alternatives. In Proceedings of the 8th international conference on Quantum Interaction (QI-14), Filzbach, Switzerland, 30 June–3 July 2014.
28. Cooke, R.M.; Goossens, L.L.H.J. Tu delft expert judgment data base. *Reliab. Eng. Syst. Safe* **2008**, 93, 657–674.
29. Nagar, Y.; Malone, T.W. Making business predictions by combining human and machine intelligence in Prediction Markets. In *ICIS*; Galletta, D.F., Liang, T.-P., Eds.; Association for Information Systems: Chicago, IL, USA, 2011.
30. Kamar, E.; Hacker, S.; Horvitz, E. Combining human and machine intelligence in large-scale crowdsourcing. In Proceedings of the 11th International Conference on Autonomous Agents and Multiagent Systems—Volume 1, International Foundation for Autonomous Agents and Multiagent Systems: Valencia, Spain, 4–8 June 2012; pp. 467–474.
31. Meadows, D.H.C.O.R. *The Limits to Growth; a Report for the Club of Rome's Project on the Predicament of Mankind*; Universe Books: New York, NY, USA, 1972.
32. Micic, P. Future markets-radar: A case study of applied strategic foresight. *Technol. Forecast. Soc. Chang.* **2010**, 77, 1499–1505.
33. McGregor, D. The major determinants of the prediction of social events. *J. Abnorm. Soc. Psychol.* **1938**, 33, 179–204.
34. Harrison, P.A.; Holman, I.P.; Cojocaru, G.; Kok, K.; Kontogianni, A.; Metzger, M.J.; Gramberger, M. Combining qualitative and quantitative understanding for exploring cross-sectoral climate change impacts, adaptation and vulnerability in europe. *Reg. Environ. Chang.* **2013**, 13, 761–780.
35. Burt, G. Towards the integration of system modelling with scenario planning to support strategy: The case of the UK energy industry. *J. Oper. Res. Soc.* **2011**, 62, 830–839.
36. Busetti, F.; Marcucci, J. Comparing forecast accuracy: A monte carlo investigation. *Int. J. Forecast.* **2013**, 29, 13–27.
37. Milfont, T.L.; Gouveia, V.V. Time perspective and values: An exploratory study of their relations to environmental attitudes. *J. Environ. Psychol.* **2006**, 26, 72–82.

38. Daly, M.; Harmon, C.P.; Delaney, L. Psychological and biological foundations of time preference. *J. Eur Econ. Assoc.* **2009**, *7*, 659–669.
39. Zimbardo, P.G.; Boyd, J.N. Putting time in perspective: A valid, reliable individual-differences metric. *J. Pers. Soc. Psychol.* **1999**, *77*, 1271–1288.
40. Carstensen, L.L. The influence of a sense of time on human development. *Science* **2006**, *312*, 1913–1915.
41. Trope, Y.; Liberman, N. Temporal construal. *Psychol. Rev.* **2003**, *110*, 403–421.
42. Trope, Y.; Liberman, N. Construal-level theory of psychological distance. *Psychol. Rev.* **2010**, *117*, 440–463.
43. Szpunar, K.K. Episodic future thought: An emerging concept. *Perspect. Psychol. Sci.* **2010**, *5*, 142–162.
44. Milfont, T.L.; Wilson, J.; Diniz, P. Time perspective and environmental engagement: A meta-analysis. *Int. J. Psychol.* **2012**, *47*, 325–334.
45. Bezold, C. Lessons from using scenarios for strategic foresight. *Technol. Forecast. Soc. Chang.* **2010**, *77*, 1513–1518.
46. Seligman, M.E.P.; Railton, P.; Baumeister, R.F.; Sripada, C. Navigating into the future or driven by the past. *Perspect. Psychol. Sci.* **2013**, *8*, 119–141.
47. Boschetti, F.; Fulton, E.; Bradbury, R.; Symons, J. What is a model, why people don't trust them and why they should In *Negotiating Our Future: Living Scenarios for Australia to 2050*; Raupach M.R., McMichael A.J., Finnigan, J.J., Manderson, L.H.W.B., Eds.; Australian Academy of Science: Canberra, Australia, 2013; Volume 2, pp. 107–118.
48. Rosen, R. *Anticipatory Systems. Philosophical, Mathematical and Methodological Foundations*; Pergamon Press: Oxford, UK, 1985.
49. Poli, R. An introduction to the ontology of anticipation. *Futures* **2010**, *42*, 769–776.
50. Poli, R. The many aspects of anticipation. *Foresight* **2010**, *12*, 7–17.
51. Kashima, Y.; Shi, J.Q.; Tsuchiya, K.; Kashima, E.S.; Cheng, S.Y.Y.; Manchi, M.; Shin, S.H. Globalization and folk theory of social change: How globalization relates to societal perceptions about the past and future. *J. Soc. Issues* **2011**, *67*, 696–715.
52. Liu, J.H.; Hilton, D.J. How the past weighs on the present: Social representations of history and their role in identity politics. *Br. J. Soc. Psychol.* **2005**, *44*, 537–556.
53. Feygina, I.; Jost, J.T.; Goldsmith, R.E. System justification, the denial of global warming, and the possibility of “system-sanctioned change”. *Pers. Soc. Psychol. B* **2010**, *36*, 326–338.
54. Gagnon Thompson, S.C.; Barton, M.A. Ecocentric and anthropocentric attitudes toward the environment. *J. Environ. Psychol.* **1994**, *14*, 149–157.
55. Heath, Y.; Gifford, R. Free-market ideology and environmental degradation. *Environ. Behav.* **2006**, *38*, 48–71.
56. Heaven, P.C.L.; Quintin, D.S. Personality factors predict racial prejudice. *Pers. Individ. Differ.* **2003**, *34*, 625–634.
57. Jost, J.T.; Amodio, D.M. Political ideology as motivated social cognition: Behavioral and neuroscientific evidence. *Motiv. Emot.* **2012**, *36*, 55–64.
58. Jost, J.T.; Glaser, J.; Kruglanski, A.W.; Sulloway, F.J. Political conservatism as motivated social cognition. *Psychol. Bull.* **2003**, *129*, 339.

59. Kahan, D.M.; Peters, E.; Wittlin, M.; Slovic, P.; Ouellette, L.L.; Braman, D.; Mandel, G. The polarizing impact of science literacy and numeracy on perceived climate change risks. *Nat. Clim. Chang.* **2012**, *2*, 732–735.
60. Kahan, D. Ideology, motivated reasoning, and cognitive reflection. *Judgm. Decis. Mak.* **2013**, *8*, 407–424.
61. Kahan, D.M.; Braman, D.; Slovic, P.; Gastil, J.; Cohen, G.L. The second national risk and culture study: Making sense of—And making progress in—The american culture war of fact. *GWU Leg. Stud. Res. Paper* **2007**, No. 307.
62. Kunda, Z. The case for motivated reasoning. *Psychol. Bull.* **1990**, *108*, 480–498.
63. Leiserowitz, A. Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Clim. Chang.* **2006**, *77*, 45–72.
64. Leiserowitz, A.A. American risk perceptions: Is climate change dangerous? *Risk Anal.* **2005**, *25*, 1433–1442.
65. Pratto, F.; Çidam, A.; Stewart, A.L.; Zeineddine, F.B.; Aranda, M.; Aiello, A.; Chryssochoou, X.; Cichocka, A.; Cohrs, J.C.; Durrheim, K.; *et al.* Social dominance in context and in individuals: Contextual moderation of robust effects of social dominance orientation in 15 languages and 20 countries. *Soc. Psychol. Pers. Sci.* **2013**, doi:10.1177/1948550612473663.
66. Unger, R.K. Them and us: Hidden ideologies-differences in degree or kind? *Anal. Soc. Issues Public Policy* **2002**, *2*, 43–52.
67. Mirisola, A.; Sibley, C.G.; Boca, S.; Duckitt, J. On the ideological consistency between right-wing authoritarianism and social dominance orientation. *Pers. Individ. Differ.* **2007**, *43*, 1851–1862.
68. Lewandowsky, S.; Gignac, G.E.; Oberauer, K. The role of conspiracist ideation and worldviews in predicting rejection of science. *PLoS One* **2013**, doi:10.1371/journal.pone.0075637.
69. Duckitt, J.; Bizumic, B.; Krauss, S.W.; Heled, E. A tripartite approach to right-wing authoritarianism: The authoritarianism-conservatism-traditionalism model. *Polit. Psychol.* **2010**, *31*, 685–715.
70. Duckitt, J.; Sibley, C. A dual-process motivational model of ideology, politics, and prejudice. *Psychol. Inq.* **2009**, *20*, 98–109.
71. Duckitt, J.; Wagner, C.; du Plessis, I.; Birum, I. The psychological bases of ideology and prejudice: Testing a dual process model. *J. Pers. Soc. Psychol.* **2002**, *83*, 75–93.
72. Blee, K.M.; Creasap, K.A. Conservative and right-wing movements. *Annu Rev. Soc.* **2010**, *36*, 269–286.
73. Kahan, D. Culturally polarized australia: Cross-cultural cultural cognition. In *The Cultural Cognition Project*; Yale University: New Haven, CT, USA, 2012.
74. Leviston, Z.; Price, J.; Malkin, S.; McCrea, R. *Fourth Annual Survey of Australian Attitudes to Climate Change: Interim Report*; CSIRO: Perth, Australia, 2014.
75. Sandbrook, C.G.; Fisher, J.A.; Vira, B. What do conservationists think about markets? *Geoforum* **2013**, *50*, 232–240.
76. Costanza, R.; d'Arge, R.; deGroot, R.; Farber, S.; Grasso, M.; Hannon, B.; Limburg, K.; Naeem, S.; O'Neill, R.V.; Paruelo, J.; *et al.* The value of the world's ecosystem services and natural capital. *Nature* **1997**, *387*, 253–260.

77. De Groot, R.; Brander, L.; van der Ploeg, S.; Costanza, R.; Bernard, F.; Braat, L.; Christie, M.; Crossman, N.; Ghermandi, A.; Hein, L.; *et al.* Global estimates of the value of ecosystems and their services in monetary units. *Ecosyst. Serv.* **2012**, *1*, 50–61.
78. Daly, H.; Farley, J. *Ecological Economics, Principles and Applications*; Island Press: Washington, DC, USA, 2010.
79. Dryzek, J.S. *The Politics of the Earth, Environmental Discourses*, 2nd ed.; Oxford University Press: New York, NY, USA, 1997.
80. Roe, E. *Narrative Policy Analysis: Theory and Practice*; Duke University Press: Durham, UK, 1994.
81. Urhammer, E.; Ropke, I. Macroeconomic narratives in a world of crises: An analysis of stories about solving the system crisis. *Ecol. Econ.* **2013**, *96*, 62–70.
82. Organisation for Economic Co-operation and Development. Secretary-General OECD iLibrary. In *Towards Green Growth*; OECD: Paris, France, 2011; p. 142.
83. United Nations Environment Programme. *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*; UNEP: Nairobi, Kenya, 2011; p. 630.
84. Green European Foundation. Green New Deal. Available online: <http://greennewdeal.eu/what-is-the-gnd.html> (accessed on 22 December 2014).
85. Green New Deal Group. Green New Deal. Available online: <http://www.greennewdealgroup.org/> (accessed on 19 December 2014).
86. NEF. A Green New Deal. Available online: <http://www.neweconomics.org/publications/entry/a-green-new-deal> (accessed on 19 December 2014).
87. Wikipedia. Green new deal. Available online: [http://en.wikipedia.org/wiki/Green_New_Deal\(2014\)](http://en.wikipedia.org/wiki/Green_New_Deal(2014)) (accessed on 19 December 2014).
88. Wikipedia. Steady state economy. Available online: http://en.wikipedia.org/wiki/Steady_state_economy (accessed on 19 December 2014).
89. Daly, H.E. Ecological economics. *Science* **1991**, *254*, 358–358.
90. Daly, H. From a Failed-Growth Economy to a Steady-State Economy. Available online: <http://www.eoearth.org/view/article/152885/> (accessed on 19 December 2014).
91. Daly, H. *A Steady-State Economy*; Sustainable Development Commission: London, UK, 2008.
92. Daly, H. Economics in a full world. *Sci. Am.* **2005**, *293*, 100.
93. Meadows, D.L.; Al, E. *Dynamics of Growth in a Finite World*; Wright-Allen Press: Incorporated Cambridge, MA, USA, 1974.
94. Lawn, P. Facilitating the transition to a steady-state economy: Some macroeconomic fundamentals. *Ecol. Econ.* **2010**, *69*, 931–936.
95. Daly, H.E. *Beyond Growth: The Economics of Sustainable Development*; Beacon Press: Boston, MA, USA, 1996.
96. Daly, H. A further critique of growth economics. *Ecol. Econ.* **2013**, *88*, 20–24.
97. Dietz, R.; O'Neill, D.W. *Enough Is Enough: Building a Sustainable Economy in a World of Finite Resources*, 1st ed.; Berrett-Koehler: San Francisco, CA, USA, 2013, p. 240.
98. Jackson, T. *Prosperity Without Growth: Economics for a Finite Planet*; Earthscan: London, UK/Washington, DC, USA, 2011.
99. Victor, P. Questioning economic growth. *Nature* **2010**, *468*, 370–371.

100. Martinez-Alier, J.; Pascual, U.; Vivien, F.D.; Zaccai, E. Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm. *Ecol. Econ.* **2010**, *69*, 1741–1747.
101. Levallois, C. Can de-growth be considered a policy option? A historical note on nicholas georgescu-roegen and the club of rome. *Ecol. Econ.* **2010**, *69*, 2271–2278.
102. Bonaiuti, M. *From Bioeconomics to Degrowth: Georgescu-Roegen's "New Economics" in Eight Essays*; Routledge: Abingdon, UK; New York, NY, USA, 2011; p. 280.
103. Garcia, E. Degrowth, the past, the future, and the human nature. *Futures* **2012**, *44*, 546–552.
104. Robinson, T.J.C. *Work, Leisure and the Environment: The Vicious Circle of Overwork and Over Consumption*; Edward Elgar: Cheltenham, UK; Northampton, MA, USA, 2006.
105. Costanza, R.; Kubiszewski, I.; Giovannini, E.; Lovins, H.; McGlade, J.; Pickett, K.E.; Ragnarsdottir, K.V.; Roberts, D.; de Vogli, R.; Wilkinson, R. Time to leave gdp behind. *Nature* **2014**, *505*, 283–285.
106. Easterlin, R.A.; Mcvey, L.A.; Switek, M.; Sawangfa, O.; Zweig, J.S. The happiness-income paradox revisited. *Proc. Natl. Acad. Sci. USA* **2010**, *107*, 22463–22468.
107. Trainer, T. De-growth: Do you realise what it means? *Futures* **2012**, *44*, 590–599.
108. Cattaneo, C.; D'Alisa, G.; Kallis, G.; Zografos, C. Degrowth futures and democracy introduction. *Futures* **2012**, *44*, 515–523.
109. Ophuls, W. *Plato's Revenge: Politics in the Age of Ecology*; MIT Press: Cambridge, MA, USA, 2011.
110. Zuidhof, P.-W. Thinking like an economist: The neoliberal politics of the economics textbook. *Rev. Soc. Econ.* **2014**, *72*, 157–185.
111. Baumol, W.J.; Blinder, A.S. *Economics--Principles and Policy*, 3rd ed.; Harcourt Brace Jovanovich: San Diego, CA, USA, 1985.
112. Diamond, J.M. *Collapse: How Societies Choose to Fail or Succeed*; Viking: New York, NY, USA, 2005; pp. 524–575.
113. Gross, N. *Why are Professors Liberal and Why Do Conservatives Care?* Harvard University Press: Cambridge, MA, USA, 2013; p. 393.
114. Ramirez, R.; Wilkinson, A. Rethinking the 2×2 scenario method: Grid or frames? *Technol. Forecast. Soc. Chang.* **2014**, *86*, 254–264.
115. Raven, P.G. The future's four quarters: Proposing a quadrant methodology for strategic prototyping in infrastructural contexts. *Technol. Forecast. Soc. Chang.* **2014**, *84*, 115–130.
116. Amer, M.; Daim, T.U.; Jetter, A. A review of scenario planning. *Futures* **2013**, *46*, 23–40.
117. Curry, A.; Schultz, W. Roads less travelled: Different methods, different futures. *J. Futures Stud.* **2009**, *13*, 35–60.
118. Durance, P.; Godet, M. Scenario building: Uses and abuses. *Technol. Forecast. Soc. Chang.* **2010**, *77*, 1488–1492.
119. Bezold, C. Jim dator's alternative futures and the path to iaf's aspirational futures. *J. Futures Stud.* **2009**, *14*, 123–134.
120. Shell International. *Global Scenarios 1995–2020*; Shell International BV: The Hague, The Netherlands, 1995.

121. Shell International. *People and Connections—Global Scenarios to 2020*; Shell International BV: The Hague, The Netherlands, 2002.
122. Shell International. *The Shell Global Scenarios to 2025*; Shell International BV: The Hague, The Netherlands, 2005.
123. The Royal Borough of Kensington and Chelsea. *Royal Borough 2028*; The Royal Borough of Kensington and Chelsea: London, UK, 2009.
124. Alford, K.; Cork, S.; Finnigan, J.J.; Grigg, N.; Fulton, B.; Raupach, M.R. The challenges of living scenarios for Australia in 2050. *J. Futures Stud.* **2014**, *18*, 115–112.
125. Dator, J. The future lies behind! Thirty years of teaching futures studies. *Am. Behav. Sci.* **1998**, *42*, 298–319.
126. Dator, J. Alternative Futures at the Manoa School. Available online: <http://www.jfs.tku.edu.tw/14-2/A01.pdf> (accessed on 22 December 2014).
127. Dator, J. Dream society? Ubiquitous society? No society? *Futura* **2012**, 39–43.
128. Hunt, D.V.L.; Lombardi, D.R.; Atkinson, S.; Barber, A.R.G.; Barnes, M.; Boyko, C.T.; Brown, J.; Bryson, J.; Butler, D.; Caputo, S.; *et al.* Scenario archetypes: Converging rather than diverging themes. *Sustainability* **2012**, *4*, 740–772.
129. Kok, K.; Alcamo, J. *Report Reviewing Existing Large-Scale Scenarios and Reasons for Selection of the Set Most Relevant to European Water Issues for the Fast-Track Process*; Wageningen University: Wageningen, UR, USA, 2007.
130. International Energy Agency. Energy to 2050: Scenarios for a Sustainable Future. Available online: <http://reaccess.epu.ntua.gr/LinkClick.aspx?fileticket=L1hQE9qMN4%3D&tabid=580&mid=1094> (accessed on 22 December 2014).
131. United Nations Environment Programme. *Geo4, Global Environment Outlook 4*; Progress Press Ltd.: Valletta, Malta, 2007.
132. European Commission Community Research. World Energy Technology Outlook—Weto h2. Available online: http://cordis.europa.eu/publication/rcn/11845_en.html (accessed on 22 December 2014).
133. Raskin, P.D.; Banuri, T.; Gallopin, G.; Gutman, P.; Hammond, A.; Kates, R.; Swart, R. *Great Transition: The Promise and Lure of the Times Ahead*; Stockholm Environment Institute: Boston, MA, USA, 2002.
134. Raskin, P.; Gallopin, G.; Gutman, P.; Hammond, A.; Swart, R. *Bending the Curve: Toward Global Sustainability*; Stockholm Environment Institute: Stockholm, Sweden, 1998.
135. Raskin, P.; Monks, F.; Ribeiro, T.; van Vuuren, D.; Zurek, M. Global scenarios in historical perspective. In *Ecosystems and Human Well-Being*; Carpenter, S.R., Pingali, P.L., Bennett, E.M., Zurek, M.B., Eds.; Island Press: Washington, DC, USA, 2005; Volume 2, pp. 35–44.
136. Foster, S.E. Aristotle and the environment. *Environ. Ethics* **2002**, *24*, 409–428.
137. Frasz, G.B. Environmental virtue ethics—A new direction for environmental ethics. *Environ. Ethics* **1993**, *15*, 259–274.
138. Costanza, R. Social goals and the valuation of ecosystem services. *Ecosystems* **2000**, *3*, 4–10.
139. Altemeyer, B. What happens when authoritarians inherit the earth? A simulation. *Anal. Soc. Issues Public Policy* **2003**, *3*, 161–169.

140. Boschetti, F.; Richert, C.; Walker, I.; Price, J.; Dutra, L. Assessing attitudes and cognitive styles of stakeholders in environmental projects involving computer modelling. *Ecol. Model.* **2012**, *247*, 98–111.
141. Kruglanski, A.W.; Webster, D.M.; Klem, A. Motivated resistance and openness to persuasion in the presence or absence of prior information. *J. Pers. Soc. Psychol.* **1993**, *65*, 861–876.
142. Kruglanski, A.W. *Lay Epistemics and Human Knowledge: Cognitive and Motivational Bases*; Plenum Press: New York, NY, USA, 1989.
143. Kruglanski, A.W.; Peri, N.; Zakai, D. Interactive effects of need for closure and initial confidence on social information seeking. *Soc. Cogn.* **1991**, *9*, 127–148.
144. Cacioppo, J.T.; Petty, R.E. The need for cognition. *J. Pers. Soc. Psychol.* **1982**, *42*, 116–131.
145. Cohen, A.R.; Stotland, E.; Wolfe, D.M. An experimental investigation of need for cognition. *J. Abnorm. Soc. Psychol.* **1955**, *51*, 291–294.
146. Murphy, G. *Personality: A Biosocial Approach to Origins and Structure*; Harper: New York, NY, USA, 1947.
147. Katz, D. The functional approach to the study of attitudes. *Public Opin. Q.* **1960**, *24*, 163–120.
148. Price, J.C.; Walker, I.A.; Boschetti, F. Measuring cultural values and beliefs about environment to identify their role in climate change responses. *J. Environ. Psychol.* **2014**, *37*, 8–20.
149. Altemeyer, B. *Right-Wing Authoritarianism*; University of Manitoba Press: Winnipeg, MB, Canada, 1981; p. 352.
150. Heaven, P. Social identities and individual differences: Relationships with prejudice. In Proceedings of the 3rd Annual Conference of the Society of Australasian Social Psychologists, Wollongong, Australia, 17–20 April 1997; Heaven, P., Ed.; Australian Journal of Psychology: Wollongong, Australia, 1997.
151. Meertens, R.M.; Lion, R. Measuring an individual's tendency to take risks: The risk propensity scale1. *J. Appl. Soc. Psychol.* **2008**, *38*, 1506–1520.
152. Smith, J.B.; Bristor, J.M. Uncertainty orientation: Explaining differences in purchase involvement and external search. *Psychol. Mark.* **1994**, *11*, 587–607.
153. Joireman, J.; Shaffer, M.J.; Balliet, D.; Strathman, A. Promotion orientation explains why future-oriented people exercise and eat healthy: Evidence from the two-factor consideration of future consequences-14 scale. *Pers. Soc. Psychol. B* **2012**, *38*, 1272–1287.
154. Stanovich, K. *Who Is Rational? Studies of Individual Differences in Reasoning*; Lawrence Erlbaum Associates: Mahwah, NJ, USA, 1999.
155. Stanovich, K.E.; West, R.F. Individual differences in rational thought. *J. Exp. Psychol.* **1998**, *127*, 161–188.
156. Brown, A.G.; Tooth, S.; Chiverrell, R.C.; Rose, J.; Thomas, D.S.G.; Wainwright, J.; Bullard, J.E.; Thorndycraft, V.R.; Aalto, R.; Downs, P. The anthropocene: Is there a geomorphological case? *Earth Surf. Proc. Land* **2013**, *38*, 431–434.
157. Hendrickson, N. Counterfactual reasoning and the problem of selecting antecedent scenarios. *Synthese* **2012**, *185*, 365–386.
158. Gowdy, J.; Krall, L. The ultrasocial origin of the anthropocene. *Ecol. Econ.* **2013**, *95*, 137–147.
159. Slaughter, R.A. Welcome to the anthropocene. *Futures* **2012**, *44*, 119–126.

160. A global perspective on the anthropocene. *Science* **2011**, *334*, 34–35.

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