













Acknowledgements

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Message from the President

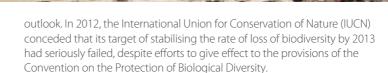
When the Conservation Council SA (CCSA) released its Blueprint for a Sustainable Future in October 2009, this constituted the culmination of an extensive process of investigation and consultation, including with other stakeholder interests besides the environment movement. The stated goal of the Blueprint was "to take a comprehensive look at environmental policy in South Australia in six key areas, and to consider how it might be improved to deliver the best possible outcomes." It presented 64 detailed recommendations across these six areas of Biodiversity, Coast and Marine, Water, Planning and Development, Energy and Waste.

Over four years later, it is inevitable that this impressive document, which has served well in providing a framework and point of reference for CCSA's environmental campaigns and advocacy, needs refreshing. However, given the solid policy foundation that it provides, it has not been felt necessary to repeat the lengthy and complex process that led to its creation. Instead, each of the six policy chapters has been reviewed by the CCSA Environmental Standing Committee responsible for policy in that area

This review has taken into account developments in the past four years in each of the six areas for example in relation to marine protected areas, the Murray-Darling Basin, the national carbon tax and renewable energy. We then reviewed and revised where appropriate the 2009 document's recommendations. Regrettably, many of the original recommendations remain unattended to by the state and federal governments and have been retained. Other recommendations were revised in response to changing conditions and circumstances while a number of new ones were added.

This review also provided an opportunity to reflect on the 2009 Blueprint's overall structure and content. In framing its recommendations across six selected areas of environmental policy, the original document focussed on the key symptoms of environmental degradation, but confined its treatment of the underlying causes to an introductory chapter. In its introduction, the 2009 Blueprint outlined the challenge faced on a global scale in relation to climate change and briefly discussed the influence of resource consumption and the growth paradigm. It then sought to link these matters to the challenges faced in South Australia, noting in particular the clear conflicts between the sustainability and other targets in the 2004 SA Strategic Plan. For example, it questioned whether it is possible to reduce South Australia's ecological footprint while growing our population substantially.

The past four years have seen some disturbing developments in relation to global environmental trends. The impacts of climate change appear to be accelerating, as reflected in increased major weather events and melting of the Arctic ice sheet. Meanwhile, the loss of biodiversity continues unabated. This period has also seen the manifest incapacity of the international treaty system to effectively address these challenges. The Copenhagen Climate Change Conference in December 2009 signalled that a new, comprehensive global agreement on the reduction of greenhouse gas emissions was nowhere near reality, and subsequent annual meetings of climate change negotiators have served to confirm this bleak



What seems increasingly evident therefore is that responses to environmental degradation based on law and regulation, whether at the global, national or local level, will not be capable of delivering the responses required because almost exclusively they address the symptoms rather than the underlying causes. Both climate change and biodiversity are ultimately symptoms, rather than causes, of environmental degradation and can only be addressed effectively by acknowledging and tackling the underlying drivers of the unsustainable patterns of human society.

With these stark realisations in mind, the review of the Blueprint has involved an additional task, namely to strengthen the introductory analysis of the global context and its implications for South Australia. This chapter presents some specific recommendations with respect to how to approach the drivers of unsustainability in South Australia, bearing in mind that ultimately only global action can effectively deliver strategies that may enable human civilisation to avoid a catastrophic ecological and economic collapse within the first half of this century – or in other words, within the next 35 years or so.

Finally, the review considered two other matters.

First, it was agreed to once more treat climate change as a cross-cutting, interconnected issue to be addressed where relevant in each of the six specific policy areas. Hence mitigation of climate change is considered in the Energy section, adaptation is discussed within the Biodiversity section and references to climate change policies will be found in most other sections.

Second, a significant omission from the original Blueprint was identified in relation to indigenous peoples and the environment. CCSA acknowledges the importance of engagement with indigenous communities in relation to the management of the natural resources of South Australia and also the need for prior, informed consent to be obtained from such communities wherever policies or decisions might affect them and their land. The nature

of the current review, in particular the desire to produce an updated version within a tight timeframe of six months, has not allowed sufficient time for an appropriate level of consultation with representatives of indigenous interests in South Australia before incorporating relevant recommendations. Instead, CCSA commits to undertaking a process of consultation with representatives of indigenous communities in order to develop an additional, future component of the Blueprint that will address this important perspective.

The extensive range of policy-related recommendations contained in this revised version of the Blueprint were also taken on board in preparing a new strategic plan for CCSA. Taken together, these two documents chart a clear direction for our campaign and advocacy activities over the next few years.



PROFESSOR ROB FOWLER

CCSA PRESIDENT



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COAST
AND MARINE
ENERGY
ENERGY
DEVELOPMENT
WASTE



OUR SUSTAINABILITY VISION

Our Sustainability Vision

Our sustainability vision is for a world in which humans live healthy, fulfilling lives in balance with nature. Economic activity has been fundamentally remodelled to reuse non-renewable resources as many times as possible or replace them with renewable ones. Human societies no longer require resources beyond our planet's carrying capacity. The result is that ecosystems are able to increase their size and diversity, providing a stable base for all life on earth for generations to come.

The Unsustainability Problem

Each chapter in this volume deals with a symptom of Australia's environmentally unsustainable direction. Just as with human disease, symptoms demand attention. But unless the underlying disease is cured, no amount of attention to the symptoms will maintain health.

The underlying disease facing human civilisation and our ecosystems is the almost universal attempt to achieve continual growth on a finite planet. This is what the environmental economist, Robert Costanza, has labelled the "growth addiction". It was recognised over 40 years ago by the Club of Rome in its seminal report, "The Limits to Growth", which remains on track in terms of its future scenarios despite widespread criticism by conventional economists in the 1980s and 1990s. Humanity is fast approaching a situation in which it must confront significant changes of an economic, social and ecological character unless there is a rapid transition to a sustainable world.

In 1969 the US National Academy of Science published a book of essays, edited by Preston Cloud, titled Resources and Man. It concluded:

It now appears that the period of rapid population and industrial growth that has prevailed during the last few centuries, instead of being the normal order of things and capable of continuance into the indefinite future, is actually one of the most abnormal phases of human history. It represents only a brief transitional episode between two very much longer periods each characterised by rates of change so slow as to be regarded essentially as a period of non-growth. It is paradoxical that although the forthcoming period of non-growth poses no insuperable physical or biological problems, it will entail a fundamental revision of those aspects of our current economic and social thinking which stem from the assumption that the growth rates which have characterised this temporary period can be permanent.

In 2009 the Stockholm Resilience Institute identified nine interlinked planetary boundaries that define "a safe operating space for humanity!". The world has already exceeded three of these boundaries: biodiversity loss, climate change, and the nutrient cycle. Of the remaining six, four are at the threshold: ocean acidification, ozone depletion, freshwater consumption, and land use. The remaining two, atmospheric pollution and chemical pollution, are currently unquantified.

Humanity does not live within its means – or, in ecological terms, within the carrying capacity of the planet. At current estimates, at a global scale, 2.9 planet Earths are required to continue human beings' current rate of consumption². The fact that people are temporarily able to consume this way obscures the fact that the systems that provide resources and ecosystem services are depleting. If everyone lived like South Australians, humanity would need nearly four planet Earths³.

Many scientists have dubbed the current age the Anthropocene⁴, because changes to the planet are not due to geological shifts as in the past, but due to humans. Over the past 250 years people have caused more change to the planet than in the previous 10,000 (the Holocene). Over the past 40 years alone it is estimated the globe has lost over 28% of vertebrate animals⁵. Over the past 200 years, nearly a third of the world's mammal extinctions have been in Australia. The world has reached a point where most ecologists no longer talk about if collapse is coming, but how bad it will be

To add to the story of environmental degradation there is also the issue of climate change - once thought to be a problem for future generations but now bearing down on us today. The 2012-13 summer broke over 30 climate records in Australia⁶, while the projected changes to arctic ice coverage are happening decades faster than originally predicted. It can no longer be said that climate change is simply something that will happen far into the future, or to other countries; the reality is, it is happening right here, right now⁷.

¹ http://www.nature.com/nature/journal/v461/n7263/full/461472a.html

²WWF (2012) Living Planet Report

³ Government of South Australia (2006) South Australia's Ecological Footprint: Living Well within the Means of Nature

*Steffen, W, Crutzen, P and McNeill, J (2007) The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature' AMBIO: A Journal of the Human Environment 36 (8), 614-621

5 WWF (2012) Living Planet Report

⁶ Climate Commission (2013) The Critical Decade: Extreme Weather

⁷ 2007 Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change Core Writing Team, Pachauri, R.K. and Reisinger, A. (Eds.) IPCC, Geneva, Switzerland. pp 104







OUR SUSTAINABILITY VISION

Yet Australian governments at both the state and federal level are pursuing an extraordinary growth in fossil fuel exploration, development and exports, acting as if climate change did not exist – even as they claim to be acting on it.

However, oil and gas reserves are becoming harder and more costly to extract, in both environmental and economic terms. Industrial societies developed in the age of cheap oil and it is hard to imagine life without it. It has become integral to the global economy, not just as a fuel source but as a basic material in thousands of consumer products, agricultural inputs, medicines, chemicals and so on. But the age of cheap oil will not continue indefinitely.

Two factors affect oil availability – reserve sizes and flow rates. People currently feel energy-secure because of the focus on reserve sizes, but the large reserves of fossil fuels remaining are giving lower and lower flow rates and becoming far more energy-intensive and expensive to extract.

Energy return on investment (EROI) is measured in the number of barrels of oil it takes to extract 100 barrels. At the start of the twentieth century, the EROI was 1:100. Now it is approaching 1:9 and this is likely to drop to less than 1:5 as unconventional reserves that require hydraulic fracturing⁸ are pursued. At this ratio, it is likely that the energy used in extraction is more than the oil provides because the calculations do not include energy used in the whole production lifecycle, or ecological impacts.

One barrel of oil represents 25,000 hours of human labour, which is more than one decade of work. The average American uses 25 barrels per person per year⁹ and Australians are not far behind.

Society currently does little more than treat the symptoms of humanity's excesses. Programs designed to adapt to climate change, conserve and restore biodiversity or recycle goods simply treat the symptoms.

Humanity's environmental impact is a product of population size and per capita consumption. In the medium to long term, this damaging impact can only be stabilised or reduced if both population and per capita consumption stop increasing.

We therefore need to look at the causes of the world's unsustainable growth.

Drivers of unsustainable growth

A flawed economic system

In Australia, as in most nations, the primary measure of progress and dominant focus of media and government attention is Gross Domestic Product or GDP. However GDP was never intended to be used in this way. It reflects the amount of economic activity, but it cannot distinguish between economic activity that has long-term benefit to society and the opposite. For example, the recent extreme weather events caused by climate change,

leading to much suffering and destruction, necessarily increase economic activity in repair and replacement activities and thus add to GDP.

Neither does the capitalist economic system factor in the harmful by-products of economic activity, such as environmental destruction or increases in social inequality. This is partly because conventional economic theory places no value on functional ecosystems and the enormous range of services they provide¹⁰. For this reason, environmental and other problems are described as 'externalities' because they are external to conventional economic measures and not measured in a way that allows consideration of all the impacts – both positive and negative -- of any given activity.

What is measured is what becomes important to a society. Under capitalism, our main measure of progress is growth in economic activity rather than societal well-being. We have lost sight of why we needed to produce many goods and services in the first place.

GDP growth

In the past decade, Australia's GDP has grown by around 3% on average each year. Projections see this increasing¹¹, which matches the aspirations of governments around Australia.

Three per cent annual growth may sound small, but it is exponential: the result is the economy will double in size in just 23 years. On this trajectory, Australia's economy in 2060 would be quadruple the size it is today.

The long-term environmental damage caused by excessive consumption of non-renewables is mostly overlooked by governments, corporate entities and citizens alike. Instead, society focuses on short-term benefits that are enjoyed by a small (and shrinking) proportion of the global population.

As we are not living sustainably now, the longer we delay dramatic changes to production and consumption the more dramatic the inevitable environmental collapse will be.

Culture of over-consumption and debt reliance

As things stand, companies are rewarded and applauded for increasing their profits, their size, and their contribution to GDP. Well into the 20th century, our culture valued frugality, promoted re-use, repair and recycling and recognised limits to material consumption. More recently, the West has moved to a culture of increasing material consumption that is now globally pervasive.

This consumer culture is not focussed on the identification and satisfaction of needs, but rather on the identification and exploitation of features of our psychology to stimulate desires for possessions, experiences, and status or symbols of group identification - appetites which can never be satisfied by their acquisition. Their stimulation therefore creates infinite demand, without a corresponding increase in what economists describe as "utility", which might be roughly equated with benefit or satisfaction.

The failure of increasing consumption (expressed as income per capita) to continuously increase human happiness has been demonstrated by numerous studies¹² that find happiness initially increasing as higher income takes people out of poverty, but reaching a plateau at relatively modest income levels.

The folly of high debt not only supports our unnecessary consumption culture but has also allowed the international explosion of financial services of dubious social worth. Easy loans and high debt have undermined the original social value of banks, encouraged useless speculation, and helped direct vast wealth into the hands of financial and property dealers. Many commentators are now warning that levels of national and personal debt are unsustainable, and that our financial systems now have much in common with Ponzi schemes. This is a seriously unstable scenario with unpredictable consequences for citizens and governments alike, and we need to take it into account as we plan a more sustainable economic future.

Inequality

The one-eyed pursuit of economic growth means that environmental and social considerations are often treated as secondary. Economic growth may alleviate extreme poverty to some extent, and this is an important goal. However, it has been demonstrated that economic growth does not single-handedly prevent stark inequalities within societies. Ideas for addressing income inequality have included setting maximum pay differentials, more employee ownership, more cooperatives, better gender balance and work time reduction¹³.

Inequality between nations means high rates of poverty in the developing world, substandard living conditions and healthcare and high birth rates (to both increase a family's potential breadwinners and overcome high levels of infant mortality). These factors also contribute to higher rates of unsustainable population growth.

Population

The structure of our economic system rewards population growth, which increases demand for water, energy and other resources and thereby adds to GDP. Population growth is therefore viewed as 'a good thing' and generally dominates government agendas – even when communities clearly see its flaws.

Australia's rate of population growth of 1.7% per annum¹⁴ is one of the highest in the developed world and even greater than Indonesia's at 1.3%. State and federal governments work to facilitate this growth, rather than target a stable population for Australia as soon as possible.

Population growth is a product of three factors: the birth rate, average longevity of the population, and net migration (the difference between immigration and emigration).

Longevity relates to good health, which is clearly a desirable goal. Governments are therefore most likely to influence population by their policies affecting the birth rate (such as the federal government's baby bonus, now discontinued) and migration. Like many other Western countries, the Australian birth rate is near or below population replacement level. This gives us a real chance to stabilise our population in the long-term in a socially acceptable way. However, the policy settings on immigration are currently so high that Australia's population is on a path of indefinite and unsustainable growth.

At the same time, the benefits of this population growth appear to accrue largely to major investors, as well as the immigrants themselves, while the costs and disbenefits, including the extra impact on the environment and infrastructure, are socialised. In short, population growth in Australia today is mostly driven by business (aided by compliant government policy) seeking to profit from further growth in consumption.

Growth bias in the political and media landscape

As corporations wield more and more economic power in a society driven by economic growth, this translates into political power. The power of corporations to influence policy is greatly increased through political donations. Arguably, these comments apply equally to some sections of the trade union movement that see economic growth as inextricably linked to job security.

The power of corporations to influence decisions in their favour and against the interests of the majority of the community and the environment is made pervasive through corporate ownership of the media, where it is used consistently to promote a culture in which consumption is the primary focus of society and other values are ignored.

The media landscape itself is dominated by corporations that profit from promotion of a high consumption lifestyle. For these reasons there is very little discussion of the problems with growth, either from our political leaders, or in the mainstream media. It is entirely possible for our society's collision course with reality to be a blind spot for many in the community. This means that those calling for urgent change are still in a small minority.

creases demand for water, energy and other ereby adds to GDP. Population growth is

⁸ Forbes magazine, 5 June 2013

⁹ McKibbon, B (2010) Eaarth: Making a Life on a Tough New Planet

¹⁰ http://www.guardian.co.uk/environment/blog/2013/ian/09/economv-nature

[&]quot;International Monetary Fund World Economic Outlook database http://www.imf.org/external/pubs/ft/ weo/2012/02/weodata/index.aspx

² Dietz, R. & O'Neill, D. (2013) Enough is Enough: Building a Sustainable Economy in a World of Finite

id. p.95. 131.

¹⁴ In the year ending September 2012 http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0





South Australian context

Since 2004, the defining planning document for our state has been South Australia's Strategic Plan. The plan has six priority areas, one of which is 'our environment'. However, it also has a number of growth targets that are in direct conflict with the sustainable use of resources. This is reinforced by documents such as the 30 Year Plan for Greater Adelaide, which sees population growth and urban sprawl as inevitable.

Since Jay Weatherill took over as Premier, there has been a change in emphasis away from the 100 targets in the Strategic Plan in favour of 'seven strategic priorities'. None of these mention the environment – except indirectly, for its role in providing premium food and wine.

One of the government's current priorities is to massively expand mining in South Australia, which will have enormous environmental impacts and dramatically increase the state's water and electricity use. Yet funding for the environmental agencies in government that will have to manage these consequences is being cut year on year.

There is no recognition from the government that this approach is fundamentally unsustainable.

Changing the future - new ways forward

The driving forces behind society's unsustainable behaviour interact with and reinforce each other. It is very difficult to isolate one as the single driving force behind the environmental situation we face today; strategies to tackle all of them are needed.

For example, the problems of growth need to be revealed by highlighting all the social and environmental problems that contribute to GDP. Another approach is to use alternative indicators of wellbeing, and juxtapose these with GDP to demonstrate what a flawed measure GDP is.

Alternative measures are needed to fully price externalities and make resource depletion and pollution expensive for businesses to manage.

We need to give up policies that promote population growth. Fertility rates are already declining, so simply reducing immigration to match emigration would allow our population to stabilise and eventually decline. At the same time, we need to change our over-consuming lifestyles.

It must be said, though, that the power of corporations, the all-pervasive consumption culture and community ignorance about the environmental implications of lifestyle choices make it a daunting task for the environment movement to change the current paradigm.

The government has proudly described the extensive community consultation it conducted with the revision of the Strategic Plan in 2010-11, but this applied only to the setting of the high-level vision and goals. When it came to the all-important targets, community views were not taken into account. The process for setting the seven strategic priorities has involved no community consultation whatsoever.

It is therefore doubtful whether the government has obtained any mandate from the community in favour of its growth agenda and its more recent sidelining of environmental imperatives. Indeed, the Rann and Weatherill governments' agenda appears to reflect the focus of those with a vested commercial interest in growth and consumption.

The community has also not been informed that certain targets in the Strategic Plan – for example those that relate to climate change mitigation – have been quietly abandoned in government policy. This is contrary to the government's stated ethos of 'putting communities at the centre' of natural resource management.

The government says 'Our Plan expresses our values; its targets reflect our priorities' 15. It appears, however, that the seven strategic priorities are now the government's true priorities. It is unlikely these priorities will change without a strong message from the community that they need to.

What's needed is a compelling vision of an alternative way of living that rewards and enriches people more deeply than our current culture of consumption. Potential benefits include better-connected communities, self-sufficiency, better work/life balance and healthier environments. This vision can be made tangible with real-world examples, as has been done successfully elsewhere by the Transition Town movement, a leader of which, the UK borough of Southend by Sea, says: "Indeed, by shifting our mind-set we can actually recognise the coming post-cheap oil era as an opportunity rather than a threat, and design the future low carbon age to be thriving, resilient and abundant — somewhere much better to live than our current alienated consumer culture based on greed, war and the myth of perpetual growth." 16

Another important change required is to greatly increase the visibility of how democracy is distorted by large corporations' political power – for example, by widely publishing information regarding political donations, lobbyists, and other unofficial avenues by which big money influences policy. This information could help promote much tighter restrictions on political donations by corporations.

As well as helping communities embrace a new paradigm, people need to understand that the current system is heading for inevitable and severe economic and organisational contraction, and be prepared for change that is unlikely to be smooth and benign. As episodes of serious environmental, social and economic stress become more frequent, society will need to have systems to fall back on that will ensure the most basic needs can be met for as many people as possible. Local governments could play a key role in helping to prepare their communities and creating some buffers for food and basic materials.

Recommendations

SU1: Build a vision for the state based on sustainability, not economic growth

The state government needs to build a vision for the state that does not depend on economic growth as its key driver, and instead focuses on the sustainability vision described at the beginning of this chapter. The high-level planning documents developed and used in all of its agencies must promote this vision.

SU2: Stop promoting population growth

The federal and state governments need to stop promoting domestic population growth. The easiest way to achieve this is to reduce immigration to match emigration (while maintaining a responsible refugee intake) and ensure overseas aid programs support reduced population growth in developing countries (e.g. by focusing particularly on education of women and their reproductive freedom).

SU3: Adopt alternative measures of progress other than GDP

State and federal governments should adopt alternative measures of progress (e.g. the Genuine Progress Indicator or indicators of well-being) and report on them alongside Gross State Product and Gross Domestic Product. GSP and GDP should be reported on a per capita basis.

SU4: Value our ecosystems

State and federal governments should actively work on valuing our ecosystems and internalising environmental damage in economic systems, for example by adopting the economics of ecosystems and biodiversity approach¹⁷.

SU5: Build community resilience

- Local governments should focus on programs that build social capital in their communities, to build resilience and selfsufficiency. They also need to drive the development of plans to cope with various forms of social disruption and liaise with state and federal governments to ensure buffers are put in place for provision of food, water and essential services.
- State and local governments need to work together to support alternative economic approaches, for example facilitating a network of growers markets around the city that are wellserved by public transport, encouraging the formation of food co-operatives, encouraging localised food production and supporting the development of the skills needed.
- Governments can also build resilience and a more sustainable economic model by supporting the development of small, local business enterprises, more cooperatives, more employee ownership, better gender balance and work time-sharing and reduction.
- Greater acknowledgement of the volunteer sector and improved support programs consistent with the proclaimed philosophy of 'putting the community at the centre'.

SU6: Increase government transparency

Transparency in government decision-making needs to be increased, with public disclosure of all significant political donations and details of lobbying activities carried out by those on the lobbyists' register.

SU7: Reduce personal consumption

Each South Australian needs to take positive steps to reduce their impact on the environment and actively call for the infrastructure and services that will enable this at the community scale.

OUR SUSTAINABILITY VISION

Oconservation Council SA 2014

¹⁵ http://saplan.org.au/priorities

¹⁶ http://www.transitionwestcliff.org.uk/

¹⁷ http://www.teebweb.org/



CCSA'S
POLICY RESPONSE

Conservation Council SA's policy response

Responding to the challenge of a sustainable future, CCSA has examined six key environmental areas: Biodiversity, Coast and Marine, Energy, Planning and Development, Waste and Water. The following outlines CCSA's vision for each of these areas. Specific policy recommendations are made in the respective chapters that follow.

The Unsustainability Problem

Biodiversity

A future where biodiversity is seen both as valuable for its own sake and also critical to human wellbeing, as evidenced by significant investments and integrated decision-making processes, across public and private land, to build resilience to climate change.

Coast and Marine

A future where our coastal and marine environments and their inhabitants are valued, sustainably managed and resilient to human-induced climate change.

Energy

A future where South Australia leads the nation and is at the forefront of international activity with our holistic adoption of sustainability initiatives. This will involve the development – following a systematic public engagement process – of an overarching roadmap and transition pathway to a clean energy future. Renewable energy, energy efficiency, Transport Oriented Developments (TODs) and localised food production are all integral to this and will lead to improvements across the triple bottom line of environment, economy and society. South Australia will think globally and act locally to take responsibility for its clean energy responsibilities in recognition that the current weak carbon-pricing scheme is not sufficient to tackle the urgency to mitigate climate change risks.

Planning and Development

A future where our planning and development creates communities that are largely self-sufficient, with small physical and ecological footprints. This means tackling urban sprawl and car dominance, and creating healthy human-scale environments, with abundant localised food production, water harvesting and energy generation.

Waste

A future where our society, both consumers and producers, have made the notion of 'waste' a foreign concept. In this society: all materials, including waste, are highly valued resources; manufacturers are responsible for creating products with components that can be reused or recycled; excess consumerism is discouraged and energy is captured from any residual wastes. Importantly, the community's notion of waste production is extended to include the 'waste' produced by its excess use of, for example, water (disposed of to treatment plants and the environment) and energy (fuel, through public transport or carpooling rather than individual car use).

Wate

Access to clean water is fundamental to the existence of all life on Earth. The CCSA vision is of a future where our use of water is within sustainable limits, where we have achieved super efficiency and it has become standard practice to reuse all available water as many times as possible. To achieve this vision of a sustainable society, it will be necessary to alleviate the current pressure on natural systems, minimise adverse environmental impacts, and recognise the environment as a priority stakeholder with rights to water.



BIODIVERSITY

CCSA's biodiversity vision

CCSA envisages a future where biodiversity is seen both as valuable for its own sake and also critical to human wellbeing, as evidenced by significant investments and integrated decision-making processes, across public and private land, to build resilience to climate change.

Current biodiversity trends

As an island nation, Australia has a high proportion of species that occur nowhere else on earth. South Australia has a large diversity of ecosystems, from water-dependent swamps, to spectacular arid lands in the red centre and everything in between. The value of biodiversity extends beyond the intrinsic value of the conservation of species; it is essential for a range of ecosystem services including pollination and water purification. From a purely economic perspective, biodiversity is essential for major anthropogenic activities such as tourism and recreation, pastoralism, agriculture, horticulture and forestry.

On a global scale, species extinction rates are rapidly increasing. Studies have estimated that 10–30% of the world's mammal, bird and amphibian species are now threatened with extinction¹⁸. The number of South Australian plants, animals and ecological communities at risk of becoming extinct is also growing¹⁹. In addition, the Millennium Ecosystem Assessment concluded that unless we take action to mitigate current rates of decline in ecosystem services, the costs to society will be substantial²⁰.

Introduced species, both flora and fauna, are widely recognised as one of the greatest threats to biodiversity²¹. The South Australian 2008 State of the Environment Report²² has identified that the abundance of feral rabbits, cats, camels and goats in South Australia is continuing to increase. In addition to these animal pests, there are many examples of plant pests that are having a substantial impact on our ecosystems such as buffel grass in the arid zone, olives in the temperate zone, and garden, agricultural and pastoral escapees across most of the state's ecosystems. The national cost of weeds is well over \$4 billion per annum²³ in economic terms alone.

An additional threat is the legal clearance and further fragmentation of native vegetation. This is alarming as native vegetation provides vital habitats for native animals, prevents soil erosion, guards against soil salinity and is the basis for healthy catchments.

Biodiversity in a changing climate

Climate change continues to emerge and be acknowledged as one of the greatest threats to biodiversity. It is leading to direct impacts on many species due to alteration in the ranges in which they can survive. This is further exacerbated by our existing fragmented landscapes.

Many of the impacts of climate change will be indirect e.g. changes in range of invasive species, altered land use, and changes in fire regimes. South Australia does not yet have policies or working strategies in place to protect species and ecosystems from further dramatic decline caused by climate change – for example to protect communities from weed invasion, which chronically degrades habitats.

What are the key biodiversity issues in South Australia?

Much of South Australia's economy is based on the use of biological resources and the need to maintain ecosystem services. Our primary production systems require a biodiverse landscape to ensure effective pest and disease control/management, soil conservation, soil stabilisation, pollination, salinity amelioration, and water purification²⁴.

South Australia's biodiversity is declining at an alarming rate due to:

- habitat loss, degradation and fragmentation, exacerbated by weed invasion and intensified agricultural practices
- predation and competition for food, shelter and resources from introduced flora and fauna (noting that invasive fauna and flora issues are not identical)
- introduced disease
- collection of firewood from remnant vegetation
- altered fire regimes
- inappropriate grazing regimes (e.g. overgrazing)
- inappropriate management activities including the destruction of riparian habitat for the sake of flood management or water extraction
- the inappropriate use of pesticides and herbicides (e.g. broadscale locust spraying and non-selective/poor quality weed management)
- · water pollution
- climate change effects, including increasing oceanic temperatures and acidification

¹⁸ Earthwatch Institute, World Resources Institute, World Business Council for Sustainable Development and World Conservation Union (2006) Business and Ecosystems, Atar Roto Presse SA, Switzerland

⁹Department of Environment and Heritage (2011) Biodiversity Theme Report, Australia State of the Environment Report, Accessed online http://www.environment.gov.au/soe/2011/report/biodiversity/index.html

 $^{^{20}}$ Millennium Ecosystem Assessment (2005) Overview of Reports, Accessed online http://www.millenniumassessment.org/en/Reports.aspx#

¹¹ Department for Environment and Heritage (2007) No Species Loss Strategy: A Nature Conservation Strategy for South Australia, 2007-2017, Government of South Australia, Adelaide

Provionment Protection Agency (2008) State of the Environment Report, Government of South Australia, Adelaide

²³ http://www.csiro.au/Outcomes/Safeguarding-Australia/Aust-Weed-Management.aspx

⁴ Department for Environment and Heritage (2007) *No Species Loss Strategy: A Nature Conservation Strategy for South Australia 2007-2017, Government of South Australia, Adelaide*



- population increase: while it is 'business as usual', population increase inevitably puts more pressure on biodiversity through increased housing, food, recreation etc)
- seriously inadequate and declining resources to environment agencies, particularly state government
- policies that are inadequate for the protection of biodiversity.

Changing the future – new ways forward

To address and reverse current biodiversity trends society must recognise, understand and value biodiversity both because of its intrinsic value and because humans depend on it for:

- the maintenance of ecosystem services which affect the natural storing and cycling of nutrients, stabilise soil formation, protect water resources, break down pollutants, and maintain biodiversity and environmental flows
- the maintenance of the life cycles of all species
- the valuable provision of food, medicines, clothing and building materials that are consumed by human society
- the socio-economic value of recreation
- the academic value of research and education opportunities
- the cultural and spiritual value of specific natural assets, toward community health and wellbeing.

All stakeholders must be held accountable for their environmental footprint and role in implementing change for the future protection of South Australia's biodiversity. Ongoing and rigorous monitoring to determine trends in biodiversity indicators must become standard practice and be adequately resourced.

Management plans that encourage natural ecosystem services such as biosequestration (through which plants absorb atmospheric carbon dioxide) are important. This may include maintaining original native ecosystem zones, revegetation programs, establishing tree and native species-planting programs • A greater number of policy statements for listed species or carbon sequestration forest sinks, increasing energy efficiencies or increasing renewable energy generation. Restoration programs should be based on Comprehensive Adequate and Representative Reserve System (CARRS)²⁵ principles and optimising conservation outcomes for all types of habitat.

Governments have many policies and well-meaning biodiversity strategies already. However the investment in action is limited. As we know from several audit reports, it is hard to demonstrate the benefits of government investment in nature conservation. For these plans and strategies to be effective, actions for conservation, management and awareness-raising must be backed by political will, meaningful data collection and synthesis, improved and enforceable legislation, and be targeted and supported financially.

Recommendations

BD1: Biodiversity must be the key driver of decision-making under the Commonwealth **Environmental Protection and Biodiversity** Conservation (EPBC) Act 1999.

The full suite of instruments within the Act must be used to effectively address root causes of biodiversity decline and provide maximum outcomes for species protection and recovery. Investment must be made to foster effective community engagement and partnerships for more cost-effective delivery of the Act. Specific changes include:

- The objects of the EPBC Act 1999 must be amended to require 'protection' of the environment and to 'conserve biodiversity'.
- Mechanisms need to be identified to demonstrate implementation of 'Ecological Sustainable Development' in decision-making.
- The Act should be amended to include further triggers (e.g. for greenhouse gas emissions, broad scale vegetation clearance, and unsustainable ground and surface water use).
- Any changes made to the current assessment process involving state and federal governments should ensure that the proposed future procedures for assessment at state level match or exceed the existing procedural requirements for the federal government under the EPBC Act.
- Instruments under the EPBC Act 1999 such as strategic assessments, and bioregional and recovery plans must be used in a proactive and complementary manner to address threats to biodiversity at a range of scales.
- Recovery plans to address site- and landscape-based threats to species, their associated species and habitats need greater
- and common development threats should be developed to establish best practice.
- Mechanisms for speeding up assessment of nominations for listing threatened or endangered species under the EPBC Act 1999, perhaps through bulk listings, should be explored.
- All community nominations eligible for assessment should be assured consideration.
- Provision for the protection of critical habitat should be clarified and strengthened.

- The condition class assessment as it applies to listed Ecological Communities should be reviewed as inconsistent with a recovery approach.
- A review of the "significant impact" approach to the referral, assessment and approval of projects is necessary to address cumulative impacts.
- Mechanisms to engage state/territories and community across the full scope of the Act should be identified and supported, including reinstatement of the EPBC Community Unit or equivalent service.
- The scope for third-party enforcement should be broadened and explored.
- Rights to appeal the merits of Ministerial decisions to the Administrative Appeal Tribunal should be reinstated.

BD2: Develop and implement a climate change adaptation strategy

Climate change mitigation strategies should seek to build biodiversity resilience where possible and minimise risk.

Revenue collected from carbon trading should contribute to biodiversity conservation and adaptation to climate change.

Development of climate change adaptation plans must be progressed (as outlined in the South Australian Strategic Plan²⁶) and implemented. There should be a strong focus on biodiversity resilience in these plans.

BD3: Provide more resources to better manage threats to South Australian biodiversity

Significant increases in resources are required for both public and private land, to undertake research and development, effectively evaluate management efforts and, where possible, achieve multiple outcomes at minimal risk to biodiversity. Increased investment is required in the following areas as a matter of

- ensuring information is accessible to decision makers and the wider community – particularly in support of a more integrated approach to decision-making across all stakeholders
- · delivering effective monitoring and enforcement of compliance with legislation that governs biodiversity management and protection, including biodiversity offsets
- providing funds for land acquisition to achieve conservation and biodiversity management targets, including the Comprehensive, Adequate and Representative Reserve System (CARRS) targets

- increasing financial and resource support incentives to private land managers to manage, restore and expand protected areas on private lands for landscape biodiversity outcomes
- increasing resources to fund biodiversity objectives contained in Natural Resource Management Board (NRM) plans
- undertaking comprehensive biodiversity impact assessments, including biodiversity surveys, in advance of approvals for infrastructure and resource development projects and providing the resources for timely assessment by government
- developing the capacity of SA researchers to undertake biodiversity research to inform planning, policy and practice for long-term biodiversity protection – particularly in respect of invasive plants and animals, in terms of early detection, management and surveillance
- developing state government directives for how biodiversity maintenance and management is to be reflected in the government's policy and planning
- monitoring the effectiveness of policy and planning, and investment in biodiversity conservation and threat abatement programs
- continuing collection of comprehensive baseline information relating to the extent and condition/state/status of biodiversity, ecological communities and species
- delivering adequate management of biodiversity both outside and within protected areas.

BIODIVERSITY

s http://www.environment.sa.gov.au/managing-natural-resources/Park_management/New_parks_park_ additions/CARRS Program¹⁶ http://www.transitionwestcliff.org.uk/

²⁶ http://saplan.org.au/targets/62-climate-change-adaptation

BIODIVERSITY

BD4: Strengthen the ability of the reserve system to protect biodiversity

Biodiversity outcomes provided through the reserve system for both park assets and the broader landscape should be optimised. This includes measures such as:

- strategic acquisition of land parcels should be undertaken to meet objectives for a comprehensive, adequate and representative reserve system
- greater investment is required in management in all reserves to maintain, protect and restore biodiversity assets both in reserves and across the wider landscape
- ongoing effort and long-term investment in monitoring threats and ecological responses to management actions
- appropriate management of new and emerging threats to prevent further species decline
- impacts of mining exploration and production both in and adjacent to reserves must be minimised, with certain mining practices such as long-wall mining being discontinued unless rigorous safeguards can be put in place
- the potential for aquatic freshwater protected areas should be investigated, to ensure the state's reserve system adequately caters for freshwater biodiversity
- ensure unallocated Crown Land is managed as an asset and contributes to broader biodiversity landscape outcomes
- developing effective partnerships between government and conservation-focused NGOs and community groups.

BD5: Fire management should have biodiversity objectives as a key driver

South Australia's management of fire must be world's best practice with biodiversity conservation as a key driver. This means that:

- fire management must be planned at the landscape scale with regard to biodiversity assets and be integrated across both public and private land
- fire management should include biodiversity impact assessment based on robust science and the precautionary principle used where scientific uncertainty prevails
- fire management should be undertaken within an adaptive management framework
- greater investment is required to better understand appropriate fire management regimes to maintain biodiversity resilience in South Australia as a matter of urgency
- greater integrated planning of land management including weed abatement, biodiversity assets and fire management is necessary to achieve sustainable biodiversity outcomes while

managing the risks posed by bushfire. For example, targeting woody weeds would improve biodiversity outcomes and reduce bushfire threats, and could be achieved via partnerships between the South Australian Country Fire Service and the Natural Resource Management system to educate and train community volunteers or via targeted funding for Bushcare groups.

- the 'Ecological Fire Management Guidelines' for the South Australian Code of Practice for the Management of Native Vegetation to Reduce the Impact of Bushfire must be adopted on a provisional basis only, for a period of no more than two years – to be replaced by scientifically robust guidelines developed through a rigorous process with government and community experts and peer review.
- Aboriginal expertise in management of fire needs to be recognised and integrated in local fire management practices where appropriate
- there needs to be acknowledgement and understanding of fire-dependent ecosystems. Plant species in such ecosystems, requiring fire for germination, risk depletion without appropriate fire management. In addition, the germination of many species may be enhanced by the return of nutrients to the soil from fire. Therefore, regular controlled burns may be necessary to maintain those ecosystems.

BD6: Management of water resources should have biodiversity conservation as a key driver (see also Recommendation WT2)

South Australia's management of water must be world's best practice with biodiversity conservation as a key driver. This means that:

- degraded water systems must be restored and protected as a priority
- water management must be planned at the catchment scale with regard to biodiversity assets and be integrated across both public and private land
- water management should include biodiversity impact assessment based on robust science and the precautionary principle used where scientific uncertainty prevails
- water management should be undertaken within an adaptive management framework
- greater investment is required to better understand appropriate water management regimes to maintain biodiversity resilience in South Australia as a matter of urgency
- environmental flows required to maintain healthy wetlands and other water-dependent ecosystems in South Australia need to be identified and adaptively managed through regional Water Allocation Plans (WAPs) with evaluation in place

BD7: Support community engagement in biodiversity conservation

Government has a key role to undertake best practice engagement and consultation under its own processes and to encourage and support partnerships between other significant stakeholders (including industry, communities and NGOs) to achieve biodiversity outcomes. Specific examples include:

- large-scale restoration efforts, such as NatureLinks, require
 genuine contributions from and partnerships between all
 levels of government, NRM bodies, land managers, Aboriginal
 communities, the wider community and environmental NGOs.
 The approach taken by the NatureLinks NGO Partners Forum is
 to be commended and applied to other government initiatives.
- additional resources must be provided to enable community members and community groups to undertake biodiversity work in South Australia. Local government and NRM Boards have a key role to play in providing these systems and resources to support and encourage community participation in biodiversity conservation.
- widespread adoption of community engagement and consultation protocols, guided by the International Association for Public Participation²⁷ spectrum for public participation, is needed. Workplace training in their application and development of case studies to highlight effective partnership governance models will also be required as will investment in NGOs and NRM Boards to broker and foster partnerships.

BD8: Strengthen initiatives that educate the community about the environment

Environmental education both within and outside the formal education sector provides unique opportunities to connect the public to the importance and value of biodiversity to all aspects of our lives. Its delivery should be further supported and strengthened, and founded establishing regular, positive interaction with the natural environment. Specific proposals include:

- opportunities to learn about sustainable lifestyles and landscapes through participation in local biodiversity conservation initiatives should be developed and promoted
- stronger partnerships should be developed between educators, scientists, business, policy makers, NGOs and practitioners
- biodiversity and sustainability should be core elements of primary, secondary and tertiary education. Successful programs such as AuSSI (Australian Sustainable Schools Initiative) and NRM education should receive ongoing support.

- an ecological literacy assessment program should be developed for all age groups to provide feedback on success of environmental education programs and inform their development and review.
- ongoing support should be provided to help develop youth leadership (such as the Youth Environment Council).

BD9: Develop incentives to maintain biodiversity on private lands

South Australia needs to develop a transparent framework of incentives to support and develop sustainable practices and stewardship activities for biodiversity assets on private land, with payments proportional to outcomes. The framework should include stewardship payments, industry incentives and biodiversity credits.

BD10: South Australia's biodiversity legislation needs to be strengthened.

Biodiversity legislation in South Australia is inadequate in its current form. South Australian legislation should define a general statutory duty in relation to biodiversity and in ensuring No Species Loss. Specific additional changes include:

- a state statutory listing process with public nominations that is directly linked to, and harmonised with, existing processes under the Environment Protection and Biodiversity Conservation Act 1999 and which also provides for recovery and threat abatement plans
- the No Species Loss Strategy should be recognised in legislation as well as government agency strategies
- greater referral mechanisms are required in South Australian environment legislation to ensure that the best available information concerning biodiversity is available to decision makers
- impacts of plantation forestry need to be accounted for and managed under South Australian legislation
- the community's rights to participate should be strengthened through third party appeal and enforcement rights, in particular under the Native Vegetation Act 1991
- introduced freshwater fish species need to be recognised under the provisions to regulate pests under natural resource management legislation

²⁷ See www.iap2.org.au

BD11: Integrated decision-making is needed to support biodiversity outcomes

Integrated decision-making across projects, programs, planning, policy, legislation and monitoring and evaluation should be supported by greater investment in a series of informal and formal links, referrals, cross-government agreements and delivery strategies, and partnerships. This includes:

- biodiversity management decision making and planning to be lifted to a regional scale by resourcing coordination of planning within regional areas such as the designated NatureLinks corridors.
- pest, forestry and fire management to be integrated across both public and private lands, based on sound ecological guidelines and to maximise natural resource outcomes including biodiversity. (There are some good models where this already happens – e.g. South Para region, and there is some integration already in fire management in the Mount Lofty Ranges)
- where conflicts occur in projects affecting the environment, a system is needed to take heed of the precautionary principle
- fully integrated costing of natural services provided by ecosystems upon which society relies for survival. Once properly costed, the value of these natural services can be appropriately considered in decision-making.

BD12: Our planning system should protect our native vegetation and biodiversity (see also the chapter on Planning and Development)

Ecological sustainability is integral to long-term economic development. Planning and development policies and processes must factor in protection for our native vegetation and biodiversity assets. This includes:

- biodiversity offset schemes should only be considered as a last resort – not applied liberally in the development assessment process. Where used, they must demonstrate best practice and include adequate monitoring and enforcement.
- the extent and scale of healthy landscapes required to achieve healthy ecosystem function in South Australia need to be provided for in all key planning and policy documents
- rezoning/subdivision of a site should be conditional upon the land undergoing biodiversity assessment to determine if there is significant native vegetation on the site (e.g. significant trees, habitat, species listed under EPBC Act). Legislation should ensure that entire tracts of native vegetation cannot be cleared during a development process
- the relevant Minister should have the power to disallow a proposed development or development plan amendment that is likely to significantly impact on biodiversity and remnant vegetation.

Note:

The above recommendations are not listed in any priority e.g. for the federal government, CCSA may place emphasis on the EPBC Act as its highest priority for change (BD1); whereas for the state government, resourcing to manage threats to biodiversity and implementing a climate change adaptation strategy (BD2 and BD3) may be the highest priorities.



COAST
AND MARINE

CCSA's coast and marine vision

CCSA envisages a future where our coastal and marine environments and their inhabitants are valued, sustainably managed and resilient to human-induced climate change.

Current coast and marine trends

South Australia's coastline extends more than 3,800 kilometres, ranging from cliffs, rocky shores and sandy beaches in the South East and West Coast to mud flats, seagrass, samphire and mangrove habitats in the upper St Vincent and Spencer Gulf regions²⁸.

South Australia's waters are among the most biologically diverse in the world^{29 30}. They provide habitat for a variety of plants and animals, including internationally and nationally important species such as Southern Right Whales, Australian Sea Lions, dolphins and the Leafy Seadragon. Our waters support between 12,000 to 14,000 invertebrate species, 1,500 algae, 612 fish species (occurring in <50 metres depth), 16 breeding seabird species, 33 mammal species and 12 seagrass species³¹. In our waters, 75% of the red algae, 85% of the fish species and 95% of seagrasses are found nowhere else in the world, giving them local, national and international significance. In comparison, the Great Barrier Reef shares more than 80% of its fish, coral reefs and other marine organisms with other countries in the tropics³².

Our coastal and marine environments are a valuable economic resource, supporting large commercial and recreational fisheries and an aquaculture industry, all directly worth more than \$420 million a year³³. While some South Australian fisheries are managed sustainably, others are over-fished and are currently in a depleted state^{34,35}. Whilst the aquaculture industry is regulated, its cumulative effects in our shallow gulfs are poorly understood³⁶ and require better management.

There has been a substantial increase in the development of coastal regions in the past 30 years due to a "sea change" movement fuelled by the retirement of baby boomers and the creation of marinas, waterfront housing estates and holiday housing³⁷.

Seagrass meadows along the metropolitan coast are declining, degradation of coastal reefs is increasing, and dieback of mangroves has occurred (for example) around the Bolivar Wastewater Treatment Plant^{38 39}. Far and away the greatest threats to the marine environment are land-based discharge of nutrient-rich waste water and stormwater, laden with pollutants and (sometimes) excessive sediments, which are particularly harmful to benthic marine biota.

Furthermore, recent growth in mining operations and South Australia's global trade in minerals has seen an increase in shipping traffic, in turn increasing the risk of marine pest transfers through ballast water⁴⁰ and hull fouling.

Coast and marine in a changing climate

As human populations increase so has the pressure on coastal environments from development, pollution, and habitat modification. Human-induced climate change exacerbates these pressures as changes in temperature, sea level, wind, currents, acidification and climate patterns all affect our coast and marine environments.

Changes to oceanic processes from human-induced climate change will influence upwelling, circulation, mixing and surface warming. In some instances these changes are likely to lead to increased stratification that reduces the availability of deep-sea nutrients. In other instances the change in upwelling processes may substantially modify the supply of deep sea nutrients for coastal and shelf waters. Such changes to marine ecological processes from human-induced climate change include:

- changes in species abundance (some species will disappear, others will be more or less abundant)
- changes in species distribution (range changes, migration paths)

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²⁸ Edgar G J (2012) Australian Marine Life: The Plants and Animals of Temperate Waters. Second edition. New Holland Publishers

²⁹ Edyvane, KS (1999). Conserving Marine Biodiversity in South Australia – Part 2 – Background, Status and Review of Approach to Marine Biodiversity Conservation in South Australia.

³⁰ Alleway H (2012). Marine biodiversity and the curse of endemism. RiAus. Accessed in March 2103: http://riaus.org.au/articles/marine-biodiversity-and-the-curse-of-endemism/

³¹ University of Adelaide (2013). The Southern Marine Environment. Marine Innovation South Australia. Accessed March 2013: http://www.marinebiology.adelaide.edu.au/environment/

 $^{^{32}}$ Department for Environment and Heritage (2004) Living Coast Strategy for South Australia, Government of South Australia, Adelaide.

³³ Econsearch (2012) The Economic impact of aquaculture on the South Australian state and regional economies, 2010/2011. Report prepared for PIRSA Fisheries and Aquaculture. 73 pp.

³⁴ www.pir.sa.gov.au/fisheries/publications/sa_fisheries_resources_current_status_and_recent_trends

 $^{^{35}}$ Srinivasan UT, Cheung WWL and Watson R (2010). 'Food security implications of global marine catch losses due to overfishing', Journal of Bioeconomics. October 2010, Volume 12, Issue 3, pp 183-200

^{*}Svane I and Barnett J (2008). The occurrence of benthic scavengers and their consumption at tuna farms off Port Lincoln, South Australia', Journal of Experimental Marine Biology and Ecology, Elsevier.

³⁷ South Australian Government (2005). Adelaide's Living Beaches Strategy; A Strategy for 2005-2025. Department for Environment and Heritage. South Australian Government.

Tanner JE, Theil M and Fotheringham D (2012) Seagrass Condition Monitoring: Yankalilla Bay, Light River and Encounter Bay. Final report prepared for the Adelaide and Mount Lofty natural Resources Management Board. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2012/000139-1. SARDI Research report Series No. 653.22pp.

Wear RJ and Tanner JE (2007) Spatio-temporal variability in faunal assemblages surrounding the discharge of secondary treated sewage. Estuarine, Coastal and Shelf Science, Volume 73, Issue 3-4, p 630-638

Nustralian Government (2003) Domestic vessel movements and the spread of marine pests: Risks and management approaches. Department of Agriculture, Fisheries and Forestry. Bureau of Rural Sciences. National Oceans Office.



- changes in phenology (e.g. timing of spawning, breeding) and physiology (e.g. growth rates) for key South Australian species such as the Giant Cuttlefish
- · changes in community structure (new species arriving, some going locally extinct).

New research is showing that acidification of the world's oceans is occurring faster than marine scientists had predicted⁴¹. This increase is directly related to human-induced climate change. The oceans are absorbing approximately one third of the excess carbon dioxide that human industrial activity and deforestation are releasing directly into the atmosphere.

Scientists can now measure human-generated carbon at depths of 3 km in the North Atlantic⁴². Marine scientists warn that the world's coral reefs may be extinct by the end of this century unless atmospheric CO2 emissions are reduced⁴³.

Researchers are also concerned about the impacts of ocean acidification on the ocean food web, as acidification undermines the ability of marine creatures, notably plankton, to build hard shells and skeletons. Some of the most important shell-forming creatures are plankton, which are the basis of the entire ocean food web and without which many marine species will not survive⁴⁴.

Human-induced climate change presents many new environmental challenges, and consequently coast and marine environments will need to be managed differently. Governments, on-ground managers, policy makers and community must begin making decisions about adaptation choices. The rate of climate change adaptation is important because of time lags in the climate system. Even if full mitigation began today, of human-induced climate change will inevitably damage coastal and marine environments⁴⁵.

While coastal issues such as sea level rise are high on the policy agenda, there is a general lack of recognition of the importance of marine systems in South Australia's climate change policy. Recent work⁴⁶ is also showing that the combination of over-fishing (changing trophic processes), pollution and climate change are interacting to accelerate the rate of degradation of marine ecosystems far above what any of these factors would do on their own. We need a strategy that focuses on broad based sustainable management not just a focus on single factors. We need to recognise the value of marine systems in planning and management; that marine plants are vital for sequestering carbon and that plankton ecology can influence climate⁴⁷. Marine science must underpin government mitigation and adaptation policies and targets.

What are the key coast and marine issues in South Australia?

South Australia's stunning beaches, and their importance as places for fun and recreation, are an integral part of our culture. Because of this value, human activities continue to pressure coastal and marine environments. With more than 90% of South Australians living on or near the coast and so many people working on the coast or visiting it, we are in danger of 'loving it to death'. Activities affecting our coast and marine environments include:

- pollution from stormwater, industrial effluent and waste water has decreased South Australia's coastal water quality, removing more than 10,000 ha of seagrass meadows in Gulf St Vincent^{48 49}.
- over-exploitation of natural resources by poorly managed fishing and aquaculture activities
- coastal development disrupting the natural movement of sand, irreversibly changing fragile habitat, and impacting on adjacent marine areas
- accidental introduction of pest species that disrupt the natural balance of ecosystems
- dredging of ports and harbours increasing sediment in waters and irreversibly changing fragile habitat

- irresponsible engineering of landscapes adjacent to the coast, resulting in large flows of sediment-laden stormwater onto beaches and into the sea
- lack of research and development funding by government and industry to understand and manage the coastal and marine environment.
- ⁴² Moneith DT, Stoddard JL, Evans CD, deWit HA, Forsius M, Hogasen T, Wilander A, Skjelkvale BL, Jeffries DS, Vuorenmaa J, Keller B, Kopacek J and Vesely J (2007). Dissolved organic carbon trends resulting from changes in atmospheric deposition chemistry. Nature. Vol. 450. Pp 537-540.
- ⁴³ Guldberg OH, Mumby PJ, Hooten AJ, Steneck RS, Greenfield P, Gomez E, Harvell CD, Sale PF, Edwards AJ, Caldeira K, Knowlton N, Eakin CM, Iglesias-Prieto R, Muithiga N, Bradbury RH, Dubi A and Hatziolos (2007). Coral reefs under rapid climate change and ocean acidification. Science. Vol. 318. pp 1737-1742.
- ⁴⁴ Kurihara H (2008). Effects of CO2 driven ocean acidification on the early developmental stages of invertebrates. Marine Ecology Progress Series. Vol. 373. pp 275-284.
- ⁴⁵ Brierley AS and Kingsford MJ (2009). Impacts of climate change on marine ecosystems. Current Biology. Vol 233. pp. 210-223.
- 46 See http://www.stateoftheocean.org/pdfs/1806_IPSOshort.pdf
- ⁴⁷ Beaumont NJ, Austen MC, Mangi SC and Townsend M (2008). Economic valuation for the conservation of marine biodiversity. Marine Pollution Bulletin. Vol. 56, pp. 386-396.
- ⁴⁸ Bryars, S. (2008) (Ed) 'Restoration of coastal seagrass ecosystems: Amphibolis antarctica in Gulf St Vincent, South Australia.' South Australian Research and Development Institute (Aquatic Sciences), Adelaide, 90pp. Publication No. F2008/000078
- ⁴⁹ Neverauskas V (1987) Monitoring seagrass beds around a sewage sludge outfall in South Australia. Marine Pollution Bulletin. Vol. 18, pp 158-164.

Changing the future – new ways forward

The state government has identified the need for strategic planning and integrated management in long-term conservation, development and productivity of coast and marine environments. A coordinated approach to management is required together with an increased commitment to the coast and marine roles and responsibilities by the NRM boards. There must also be an increase in support to develop best practice management activities that will serve to protect the natural resource value of coast and marine environments.

To protect our threatened coast and marine species there must be a review of current legislation and an extension of the protection afforded to marine species that are identified as 'threatened' under the legislation. For informed decisions to be made in making legislative amendments to protect marine biodiversity, there must be increased funding for marine research programs to expand our knowledge of coastal, estuarine and marine habitats and species, ecosystems and the bio- and geophysical systems and processes that exist in South Australia.

Although Wiltshire and co-workers⁵⁰ reviewed the distribution and presence of introduced marine species, there is a need to increase resources for monitoring, awareness, education and eradication of these pests where they present a significant threat. Biosecurity of our marine resources is essential if we are to continue to reap the benefits in terms of ecological services and resource use. Education about the risks marine pests pose is needed, and a commitment by all stakeholders to adopt the principles and best-practice guidelines of legislation and policies is critical for execution to be successful.

Marine-based industries will continue to play a part in our state's economy and must be well managed. South Australia's aquaculture industry is growing, and if appropriate management plans and monitoring schemes are not in place, aquaculture operations can have a significant impact on the environment. Poorly planned or overstocked developments and high levels of feed and waste products may elevate nutrient levels and reduce water quality surrounding the farm⁵¹.

For some commercial fisheries, a major issue is by-catch. Research and development into ways of reducing by-catch is needed, as is monitoring and policing the levels of by-catch that presently occur. For other fisheries, the challenge is to convert existing research into fisheries policy and regulations. One consequence of exploitation is the evolutionary decline in growth rate and productivity, as the fast-growing and largest fish are exploited – a consideration never included in fisheries management strategies. Another consequence is 'fishing down the food web' i.e. the collapse of higher-level food web species with consequent cascade and other effects down the food web.

There is a need to introduce ecosystem-based fisheries management involving the development of ecosystem models. Progress is being made, albeit slowly, with one such model developed for the eastern Great Australian Bight, and one in progress for Spencer Gulf. Conversion of these models into fisheries policy is lacking, with the notable exception of the sardine fishery.

Management and regulation of recreational fishing is essential to minimise the potentially significant impact of overfishing species on marine biodiversity.

A significant development for the future of South Australia's marine environment is the establishment of a system of marine parks. Key to their success will be the commitment of adequate resources to promote them, educate about their values, monitor and police them. Equally important is the way in which the community is involved. CCSA believes that an active citizen science program, alongside a public education program, will be the key to creating and maintaining support for the integrity of the marine parks system.

The likely impacts of oil and gas exploration (and subsequent exploitation) pose additional threats to the coastal and marine environment. If these are to proceed, the likely negative impacts on habitats and animals need to be clearly understood and managed.

COAST
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⁵⁰ Wiltshire, K, Rowling, K and Deveney, M (2010) Introduced marine species in South Australia. A review of records and distribution mapping. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2010/000305-1. SARDI Research Report Series No. 468. 232p.

⁵¹ Environment Protection Authority (2003) State of the Environment Report, Government of South Australia Adelaide





CM1: Adequate resources must be allocated to monitor and manage marine parks

This is essential to ensure that the marine parks system is effective in achieving its conservation and sustainability goals. Funding needs to cover:

- ongoing, long-term scientific mapping, monitoring, research and assessment both inside and outside marine parks
- · education, compliance and enforcement
- · community-based management programs.

Provision of adequate funding for these tasks must be a priority for the state government and Natural Resource Management (NRM) Boards. Rural NRM Boards and councils with coastal frontage will need financial support given the small funding base directly available to them.

Monitoring of the marine parks must be targeted at informing the first (10-year) review of the parks' design.

CM2: Community (and conservation) involvement in marine parks must be adequately resourced

The long-term success of marine parks will depend on ongoing community support and involvement. This must include an active, well-resourced and supported citizen science program in which community members are involved in data collection and monitoring. Existing citizen science-based programs such as Fish Watch, Reef Watch and Reef Life Surveys need to be supported and expanded. Natural Resource Management Boards, in particular, should place a priority on building an active citizen science program.

CM3: Commercial fishing operations must aim to substantially reduce by-catch

Despite the government and industry focus on a sustainable fishing industry, there is still a considerable quantity of by-catch from commercial fishing operations. There needs to be increased funding for research aiming to reduce quantities of by-catch (e.g. the prawn fishery T4 nets) and for inspections of commercial fishing operations examining their by-catch.

A set percentage of returns from commercial fishing needs to be set aside for marine species research.

CM4: Incorporate ecosystem-based models into fisheries management

Incorporation of ecosystem-based models into fisheries management requires:

- adequate funding for model research and development including validation and verification
- collaboration and consensus between the seafood industry, research and fisheries management organisations
- translation of model outputs into effective and efficient fisheries policy.

CM5: Threatened species legislation must be harmonised

Commonwealth (Environment Protection and Biodiversity Conservation Act 1999) and state (National Parks and Wildlife Act 1972 and Fisheries Management Act 2007) legislation addresses the conservation status e.g. threatened, endangered etc., of marine species. However there is no harmonisation between these pieces of legislation or consistency with international definitions of threat status. Some marine species can be listed with a high threat status under one piece of legislation but not listed at all under another. This leads to inconsistent management and is confusing to commercial and recreational fishers.

CM6: Develop a plan responding to sea level rise

CCSA believes that sea level rise may threaten much of the state's coastal infrastructure and built development and is concerned that planned and future protection measures to mitigate these threats may adversely impact on the coastal and marine environment. Sea walls pose particular problems such as altering coastal hydrodynamic and associated erosion and deposition processes. CCSA recommends that the state government work with local councils to develop a state plan to respond to projected sea level rise that minimises the impact on the coastal and marine environment and provides timely relocation of built infrastructure.

CCSA also urges the government to establish a 'no-go' buffer between the high water mark and development in order to mitigate environmental impacts and risks to infrastructure.

CM7: Improve the quality of coastal waters and estuaries

The state government must implement strategies to further reduce the load of treated effluent being discharged into the marine environment. Re-use of treated water for commercial and industrial activities must be a priority. CCSA supports Professor Anthony Cheshire's call for a target of zero discharge of waste to the marine environment by 2015⁵².

Storm water management policies need to be extended to address not only flood risk but also storm water quality. The development of storm water capture and reuse systems should be an ongoing priority along with improvements to catchment management that focuses on both prevention and treatment of storm water discharges.

The licensing, monitoring and control of brine discharges from desalination plants needs to be rigorously implemented by the Environment Protection Authority, with adequate resources and full public transparency. Mandatory requirements must include temporary suspension of operations when triggers are exceeded and a permanent stop to business activities if stated dilution targets are consistently breached.

CM8: Ensure compliance with aquaculture protocols

CCSA notes that considerable effort has been invested to ensure that the aquaculture industry is managed on a sustainable basis. CCSA believes that the government must commit to providing the necessary resources to ensure industry compliance with the agreed Regulations. Aquaculture licences that are not sufficiently viable to monitor according to the agreed protocols must be handed back to the government and re-allocated where

CCSA also recommends that the government makes compliance reports publicly available, updated regularly and in an easily accessible format.

CM9: Recreational fishing must be licensed

Recreational fishing must be licensed as in other states. Licence fees must be directed towards supporting this valuable industry by increased research into non-commercial species, education of recreational fishers and increased policing of illegal activities on public jetties and elsewhere.

CM10: Management of dredge spoil must be best practice

CCSA notes that dredging activities in ports, harbours and shipping channels may be required for operational reasons. Its concern is over the spoil produced by dredging activities. CCSA recommends that the management of dredge spoil must follow best practice guidelines. These must include the development of a monitoring plan. CCSA also recommends that the results of monitoring must be publicly accessible.

52 Cheshire, A. (2006) A Vision for Adelaide's Coastal Waters and Environments in 2020 http://www.amlrnrmsa.gov.au/Portals/1/Programs_Projects/christie-tf/cheshire_pres.pdf

COAST **AND MARINE**

CM11: The benefits of a healthy coastal and marine environment must be promoted

CCSA recommends that the messaging associated with the protection and management of South Australia's coastal and marine environment must emphasise the value to the state of maintaining the health of coastal and marine environments. This value is to be found in ongoing recreational and commercial fisheries, aquaculture, bio-prospecting, ecotourism ventures and quality of life for South Australia's citizens.

CM12: Support the development of a 'Green Standard' for sustainable harvest of the marine environment

CCSA notes the positive impact on consumer purchasing of marine-sourced products that avoid by-catch and recommends that a broader 'Green Standard' covering all such products be developed.

In conjunction with this, CCSA also recommends that the Australian Standard for fish names be backed by legislation and clearly identify whether the production method involves wild catch or aquaculture (as occurs in the United Kingdom).

CM13: Review the effectiveness of the Biosecurity (pest) strategy

Keeping pests out of South Australian waters is crucial to a healthy marine environment. Resources must be allocated to review the implementation effectiveness State Biosecurity Strategy.

CCSA also recommends that a strict monitoring regime and quality research program be implemented in all ports and harbours to continuously monitor for introduced marine pests.

CM14: Prevent environmental damage from the oil and gas industry

CCSA notes the ongoing interest in oil and gas exploration off the South Australian coast and is concerned about potential negative impacts to the environment and biota. Recent incidents in the Gulf of Mexico have demonstrated the damage caused and costs incurred by these operations when they fail. Industry and government preparedness to an oil spill event is critical to minimising damage and CCSA recommends that:

- research be undertaken on the marine animals likely to be affected by the exploration or extraction processes to ensure their safety, before exploration takes place
- oil spill contingency plans are independently approved and publicly accessible before oil extraction operations commence
- regular 'dry runs' of oil spill emergency management procedures and exercises are undertaken by industry and government members
- licensing of oil and gas exploration and drilling includes financial commitment to a rehabilitation fund.

CM15: The South Australian marine parks systems should align with the adjacent Commonwealth marine parks network

CCSA notes that considerable investment has been made developing a marine parks system in South Australia, including creating and updating legislation. CCSA believes that the Act would be improved if it provided a mechanism to coordinate the South Australian network of marine parks with the adjacent Commonwealth network of marine parks.



ENERGY

Conservation Council SA's energy vision

CCSA envisages a future where South Australia leads the nation and is at the forefront of international activity with our holistic adoption of sustainability initiatives. This will involve the development – following a systematic public engagement process – of an overarching roadmap and transition pathway to a clean energy future. Renewable energy, energy efficiency, Transit Oriented Developments (TODs) and localised food production are all integral to this and will lead to improvements across the triple bottom line of environment, economy and society. South Australia will think globally and act locally to take responsibility for its clean energy responsibilities in recognition that the national carbon-pricing scheme and its likely successor the Direct Action Plan are each insufficient to urgently mitigate climate change risks.

Current energy trends

Australia has a very energy-intensive economy and, for many people, it is difficult to imagine the future where relatively cheap and abundant fossil fuelled energy is not available.

Energy underpins nearly every aspect of our modern industrialised and technological society. Currently, the majority of our energy requirements for the production of electricity, goods and services and for our transport needs comes from non-renewable and greenhouse gas (GHG)-intensive fossil fuels such as coal, oil and gas⁵³.

Until 2008, energy use in South Australia continued to grow, driven by growth in the economy, population and energy dependence of our lifestyles⁵⁴. In the 27 years from 1974 to 2001 total energy consumption in Australia grew on average by 2.5% per annum. In 2003 the National Framework for Energy Efficiency estimated energy consumption would continue to grow at approximately 2.3% per annum in the short term, and 2.1% in the longer term to 2020, representing a significant increase in energy consumption and corresponding greenhouse gas emissions⁵⁵. However, in recent years, there has been a slowing in demand.

The residential sector is a key driver of South Australia's greenhouse gas emissions. While our population increased by 9.4% from 1990 to 2006, residential emissions increased by an alarming 28% over the same period⁵⁶. In contrast, electricity demand has now declined marginally despite an increase in population of 5.4% since the 2006 Census. This suggests that behavioural change, efficiency measures, solar PV and solar hot water are effective means of reducing emissions. Residential emissions made up a quarter of the state's total net emissions in 2006. South Australia faces the daunting challenge to fulfil both its Strategic Plan objectives of accommodating a population of 2 million people by 2027⁵⁷, while simultaneously more than halving 1990 greenhouse gas emission levels.

An increase in population will also see increased pressures on the transport sector. 'Business as usual' would imply a substantial increase in vehicle numbers, fuel consumption and overall kilometres driven. The challenge for South Australia (with the second-oldest vehicle fleet in Australia) will be to make substantial reductions in the energy intensity of the transport

sector largely through integrated planning (including Transit Oriented Developments (TODs), increasing the share of public and active transport (walking and cycling), improving the fuel efficiency of vehicles (including a substantial shift towards low and zero-emission vehicles) and shifting freight from road to rail.

The transition to a renewably powered future is both urgent and essential. Aiming for a carbon neutral economy will create many opportunities – provided we have the political will and foresight to take advantage of those opportunities.

In 2011-12, gas-fired generation supplied approximately 45.9% of the state's electricity needs, a relatively high proportion, while coal and wind generation supplied around 21.7% and 24.2% respectively. Since 2002, levels of wind generation in South Australia have increased significantly as the state has made the best use of measures to attract investment created by the national Renewable Energy Target (RET) requirements. South Australia has 25% of the nation's wind farms, 49% of the nation's installed wind capacity, and 37% of its grid-connected solar panels. In 2011, wind generation accounted for more than 88% of the state's renewable electricity generation⁵⁹.

© Conservation Council SA 2014 31.

⁵³ Environment Protection Agency (2008) State of the Environment Report, Government of South Australia, Adelaide

⁵⁴ Department of Premier and Cabinet (2007) Tackling Climate Change: South Australia's Greenhouse Strategy 2007-2020, Government of South Australia, Adelaide.

⁵⁵ Energy Efficiency and Greenhouse Working Group (2003) Towards a National Framework for Energy Efficiency: Issues and challenges, Finsbury, Australia.

⁵⁶ Environment Protection Agency (2008) State of the Environment Report, Government of South Australia, Adelaide

 $^{^{57}\,}Government of South \,Australia \,(2011) \,South \,Australia's \,Strategic \,Plan \,2011, \,http://saplan.org.au$

⁸ http://www.sa.gov.au/subject/Water%2C+energy+and+environment/Energy/Renewable+energy/ Wind+energy/Wind+energy+in+South+Australia



South Australia's stationary energy generation has a lower greenhouse intensity than that of other mainland Australian states. The proportion of our state's electricity sourced from renewable resources has increased from less than 1% in 2002 to 26% in 2011. To maintain this level throughout the major expansion proposed for the mining and resources sectors will require the mining industry to make a strong commitment to contribute to renewable energy above the minimum mandatory requirements.

In addition to energy generation, the trends of demand need to be reviewed. Energy efficiency remains the 'low-hanging fruit' in the suite of responses to climate change. South Australia can achieve substantial reductions in emissions by simple, common sense steps and behaviour changes, as evidenced by recent falls in demand. Retrofitting insulation, solar hot water services, more efficient air conditioning and other initiatives such as shading, pergolas and verandas on houses can make substantial inroads into reducing the demand for energy and our corresponding emissions.

Energy in a changing climate

In 2003, CSIRO undertook climate change modelling for South Australia. It predicted that by 2070, the average number of days over 40°C each year would increase from 1 to 2-11⁶⁰. South Australia has recently experienced weather at the higher end and even exceeding that range.

While natural variations in climate have occurred in the past, human activities over the last 100 years (in particular the burning of fossil fuels) have caused a rapid increase in carbon dioxide and other greenhouse gases such as methane and nitrous oxide in the Earth's atmosphere. Before the Industrial Age of the 19th century, these gases had remained at near-stable concentrations for thousands of years⁶¹. The international scientific community, including the Intergovernmental Panel on Climate Change (IPCC), has acknowledged the unequivocal link between the increasing atmospheric concentration of carbon dioxide and other gases and changes in the global climate.

The latest evidence highlights that climate change appears to be happening dramatically faster than even the best estimates of only a few years ago.

What are the key energy issues in South Australia?

The fundamental issue for energy in South Australia is the need to de-couple electricity production and use from greenhouse gas emissions. While electricity demand is falling, the state's overall demand for energy continues to contribute to climate change. Urgent action is needed to further reduce demand and our ecological footprint.

Greenhouse gas emissions from the energy sector comprise 70% of Australia's greenhouse inventory. Transport accounts for 20% of the energy sector's emissions (or 14% of the national total), with stationary applications contributing the rest⁶². The largest contribution (over one-third) to Australia's emissions comes from burning fossil fuels to generate electricity. In addition, the production and use of fossil fuels creates numerous other environmental impacts associated with the mining, extraction, transport, use and disposal of waste products.

Transport consumes nearly 25% of South Australia's primary energy resources. This includes domestic, commercial and industrial transport of people, goods, and bulk commodities such as mineral ores⁶³.

Unfortunately as urban areas have continued to sprawl worldwide, dependence on motor vehicles as a primary sources of transportation has increased. Australia is no exception to this global trend. We need to tackle our car-dominated culture head-on if we are to seriously address the sprawl, pollution and destruction that accompany it. A holistic approach is needed that incorporates integrated land-use planning such as Transit Oriented Developments (TODs) that reduce the need for cars altogether, along with mode switching to cycling, walking and public transport, and the development of alternative-fuelled, zero- and low-emission vehicles. For the residential sector there are substantial opportunities to improve efficiency in both new buildings and retrofitting existing buildings , while at the same time achieving environmental benefits.

The mining industry in South Australia is seeking to expand considerably, with a large amount of exploration activity and proposed energy and minerals projects. This is likely to considerably increase both demand for energy and production of greenhouse gas emissions, unless urgent action is taken⁶⁴. The 2008 State of the Environment report stated that a minimum of 20% renewable energy for all new mining developments would be required to ensure that the state's renewable energy

targets remained on track⁶⁵. Any large-scale projects, such as the proposed expansion of the Olympic Dam mine at Roxby Downs (currently deferred), as well as the cumulative impact of smaller minerals and petroleum activities, will collectively produce a massive increase in net emissions. This will make achieving South Australia's Strategic Plan targets for greenhouse gas emissions difficult, if not impossible without major investments in renewable energy generation.

Many mining and other companies worldwide have begun investing in carbon offsets to reduce their greenhouse gas emissions. The idea is that companies establish or fund projects that reduce carbon and other emissions elsewhere, and count those reductions against their own emissions as a counterbalance to their own emissions. CCSA believes there is value in offset projects that are truly best-practice in environmental and social terms. However they should never be a substitute for minimising a project's own emissions (utilising renewable energy, energy efficiency, co-generation, etc), and should be used only after these options have all been exhausted.

Currently there is a distinct lack of renewable energy commitments such as targets for GreenPower or on-site renewables by the mining sector in South Australia. Accredited offset credits (under the National Carbon Offset Standard) can also help remove carbon already in the atmosphere from past polluting activity. This will be essential if we are ever to return to safer carbon levels below 350 ppm.

A key issue for South Australia is the need to replace its ageing Playford and Northern coal power stations at Port Augusta. These power stations have provided around a third of South Australia's electricity over a number of decades, but the Port Augusta

community and many other South Australians now know that cleaner energy technologies are available, and are calling for them to be replaced with a combination for solar thermal technology and wind - starting with Australia's dirtiest power station (per unit of energy), Playford B.

Changing the future – new ways forward

To date, South Australia has installed more wind power than any other state, is third nationally in the total number of installed rooftop solar electricity systems, and has undertaken most of the country's geothermal exploration activity⁶⁶. Doing more than most of the country however, does not necessarily mean that we are doing enough. The unabated growth in demand for energy is simply unsustainable. While it is important to keep developing the renewable energy industry, we must also address the demand itself.

Ultimately, reducing energy consumption across all sectors of the community is the key component to reducing the environmental impact of energy use, including our contribution to climate change.

The hotter, drier climate predicted for South Australia as a result

of climate change will directly influence our energy needs. A 'business as usual' approach would see ever-increasing demand for air-conditioning, for instance. Ongoing warming, increasing population and reduced rainfall has led to the fast-tracking of energy-intensive technological fixes like desalination plants. These quick fixes are at odds however with the need to reduce our energy consumption, especially in light of the government's planned population growth, which will place further demands on infrastructure and natural resources.

The legislative and regulatory frameworks developed for the energy market at a federal level, such as the Clean Energy Future carbon pricing scheme, national greenhouse targets and the Renewable Energy Target (RET), have contributed to meeting our international obligations under the United Nations Framework Convention on Climate Change (UNFCCC, or as it is more commonly known, the Kyoto Protocol), to direct the extent and pace of change in the energy sector in Australia. Yet even if all of these frameworks continued and Australia met its agreed targets, this would still be a comprehensive failure as the current emissions targets are grossly inadequate. Jurisdictions, businesses and individuals need to continue to find ways to reduce emissions that will make it easier for national targets to be tightened as quickly as possible.

Not yet on the public radar is the issue of 'peak oil' – the point at which the availability of easily extractable oil and gas starts its inexorable decline. While this will not see us 'run out of oil' in the short-term, we are already starting to run out of cheap oil, and the medium to long-term consequences of this will be profound and far reaching. Geopolitical instability, social unrest and increasing environmental degradation are all likely.

CCSA has called for an Oil Vulnerability Assessment and a Peak Oil Action Plan to be developed to ensure that South Australia is prepared for the worst, and so that we take advantage of the challenges and opportunities to reshape and remake our societies in a more sustainable manner.

The role of government is critical in this unacknowledged transition phase, but so too is the need for communities and individuals to adopt more sustainable lifestyles. Energy use can be reduced through everyday choices such as insulating houses, installing solar hot water heating or retrofitting homes with

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32. Ocnservation Council 5A 2014 33.

 $^{^{60}}$ CSIRO (2003) Climate change in South Australia, http://www.sa.gov.au/upload/franchise/Water,%20energy%20 and%20environment/climate_change/documents/what_is_cc/CSIRO_Report_CC_in_SA2003.pdf

⁶¹ Environment Protection Agency (2008) State of the Environment Report, Government of South Australia, Adelaide

 $^{^{62}} Garnaut, R. \, (2008) \, The \, Garnaut \, Climate \, Change \, Review, http://www.garnautreview.org.au/index.htm$

⁶³ Environment Protection Agency (2008) State of the Environment Report, Government of South Australia, Adelaide

⁶⁴ Deloitte (2013) Regional Mining and Infrastructure Planning project interim report summary, Accessed online at http://www.dptisa.gov.au/_data/assets/pdf_file/0009/97713/Regional_Mining_and_Infrastructure_ Planning_project_summary.pdf

 $^{^{\}rm S}$ Environment Protection Agency (2008) State of the Environment Report, Government of South Australia, Adelaide

 $^{^{66}\,}http://www.clean energy council.org. au/media events/media-releases/April-2012/110413/SA.html$

curtains, blinds or pergolas. Other sustainable lifestyle choices include catching more public transport, cycling or walking, purchasing energy-efficient vehicles and home appliances, buying locally produced food and products and reducing meat consumption. Accredited GreenPower electricity can be purchased, which helps drive future investment in renewable and low emission technologies. Most energy companies now offer these options, or alternatively, households can invest in solar photovoltaic panels.

Businesses and public utilities are also major energy consumers and need to pay attention to their consumption, efficiency and waste.

Adopting a more sustainable lifestyle influences the development of green industry and green jobs. Consumer demand creates opportunities for research, development and commercialisation of low-energy products, with the resulting benefits including cost savings from using less energy.

Energy supply is without doubt one of South Australia's great sustainability challenges. "No regrets" solutions to the energy challenge must simultaneously address social, economic and environmental needs and ideally demonstrate sustainable progress in managing each need.

Recommendations

EN1: Ensure Australia has effective policies to reduce to emissions as quickly as possible

This requires

- far higher national greenhouse reduction targets; CCSA calls for a 90% cut of 1990 emissions by 2050 and 40-50% by 2020, with a regular review mechanism
- that wherever possible, voluntary action to reduce emissions lowers the national emissions cap (i.e. GreenPower)
- mechanisms to require and fund new renewable energy installation (such as the national Renewable Energy Target, Clean Energy Finance Corporation and Australian Renewable Energy Agency - or equivalents) to be maintained and ideally strengthened
- the Direct Action Plan to be dramatically improved to ensure it drives a structural decarbonisation of Australia's economy including supply chains and end-user markets.

EN 2: Repower Port Augusta by replacing the town's coal-fired power stations with renewable energy

- South Australia could maintain its leadership role in renewable energy by being the first state to develop concentrated solar thermal technology with energy storage. This would work well in combination with increased wind capacity, and would bring new industries and jobs to the state.
- the state government should work in partnership with the Repower Port Augusta Alliance to facilitate the funding and investment for the Repower Port Augusta project to commence.

EN3: Speed up the move to a clean energy future by tightening the Climate Change and Greenhouse Emissions Reductions Act 2007 and implementing complementary policy

- the Act's emissions reduction targets should match or exceed the national targets called for above
- the Act needs to incorporate a mechanism to regularly review the Act's targets, to keep pace with the best available science The Act must maintain existing, and promote new, sector agreements for organisations wanting to take action to reduce their own emissions
- the state government should implement a cap on the greenhouse intensity of new power stations based on life cycle emissions
- the state government's carbon accounting methodology must be transparent, valid and consistent with best practice schemes used worldwide (e.g. the World Business Council for Sustainable Development standards or the World Resources Institute Greenhouse Gas Protocols).
- any offsets achieved through forestry or other landscape projects must meet best practice standards (e.g. the Climate, Community & Biodiversity (CCB) Standards) to achieve multiple benefits and avoid projects with negative environmental or social impacts. This should apply to the Carbon Farming Initiative (CFI) and the National Carbon Offset Standard (NCOS).

EN4: Expand the number of energy-related 'green jobs'

The state government, industry and the education sector should work together to create or expand existing Centre/s of Excellence to include renewable energy, energy efficiency research and development, greenhouse accounting and vocational training for 'green jobs'.

EN5: Promote energy-efficient living choices

The state government should lobby for higher performance standards and product labelling at the national level, and fund state-based community programs that promote sustainable living choices within government, business and the community.

These should include:

- the state government working co-operatively with the federal government to expand the Minimum Energy Performance Standards scheme for lighting and all electrical appliances; and progressively raise the standards required, including for standby mode. It should also increase the level of checking and auditing to ensure standards (including the building code) are met and increase penalties for noncompliance.
- the state government ensuring that any national energy efficiency scheme incorporates education and seeks to encourage behaviour change in addition to increasing energy efficiency, and maintains the key objective for reducing emissions in the scheme.
- agricultural producers need incentives and education programs to shift to more sustainable agricultural techniques, such as organic farming, that reduce dependence on petrochemical inputs. Similar assistance to boost local food production must also be developed.
- consumers need education about foods with a high ecological footprint. Increasing information available to consumers via product labelling (e.g. regarding energy and water use) enables better choices. This could be used in conjunction with minimum standards for production, transport and packaging practices.
- smart electricity meters progressively rolled out to South Australian households and businesses at no/low cost to assist in reducing energy peaks, power costs and improving sustainability. In-house displays and education on what the data means should also be provided. Opportunities to link the technology to the NBN should be investigated.
- the state government establishing a publicity mechanism to report on improvements in energy efficiency in SA that is as granular as possible (suburb level). In addition, a watchdog/ ombudsman role to police and fine suppliers and installers of faulty or substandard products is needed.





EN6: Re-invigorate the greening of state government operations

Ensure that:

- there is a coordinated, consistent government approach to sustainability
- all agencies set targets to green their operations and achieve continuous improvement (e.g. progressively increasing the required National Australian Built Environment Rating System (NABERS) ratings for all government tenancies)
- progress is reported to the public at regular intervals (e.g. every two years).
- energy measures include mandating an increase in the government contribution of South Australian generated GreenPower to stimulate demand in the industry, above what is already required by national mandatory obligations.
- the state government should contribute 100% GreenPower by 2020 for its infrastructure (including its extended business enterprises and outsourced activities) in addition to an 'energy reduction' strategy across government facilities.
- the state government should become a purchaser of last resort for any renewable energy produced in South Australia (up to their total demand).

EN7: Aim for more fuel-efficient vehicles

The state government should work through COAG for funding and regulation to deliver more fuel-efficient vehicles, and ensure its own funding and costing arrangements do the same. This includes:

- Australia should set national uniform fuel consumption and greenhouse emission standards on all new passenger vehicles, working towards an interim target of 5L/100km by 2020 and establish a longer term 2050 fuel consumption target.
- state and federal government funding for the automotive industry should be available only for low/zero emission vehicle development and commercialisation.
- registration and stamp duty costs should be substantially lower for highly fuel-efficient vehicles (including hybrid and electric) within the existing registration categories. Consideration should be given to moving to a similar model as used in the UK.
- state and federal government subsidies that promote increased private car use and support fossil-fuelled vehicles are perverse and should be abolished. The perverse incentive part of the Fringe Benefits Tax (the more you drive the less you pay) should be scrapped and the Diesel Fuel Rebate phased out. The money should be re-directed into public transport initiatives such as a trial on a specific route of increased frequency such as a 5-minute Go Zone to gauge the increase in use.

EN8: Expand the role of renewable energy

- the state government should lobby at COAG to increase renewable energy targets in national legislation. The government should also update our state's renewable energy generation and consumption targets in the Climate Change and Greenhouse Emissions Reductions Act 2007 to 50% by 2020.
- further investment is required by the state and federal governments to commercialise renewable energies that can meet the state's minimum energy draw, such as geothermal, bio-energy and solar thermal.
- the federal government should implement a national gross Feed-in Tariff for targeted large infrastructure scale renewable energy projects (e.g. 100 MW plus).
- residents with solar facilities should receive a net feed-in price from their energy retailer.
- legislation is needed at state and federal levels to ensure that all renewable energy produced in SA is used in preference to non-renewable energy (i.e. no renewable energy is wasted)
- the state government must facilitate construction of interconnectors to overcome infrastructural bottlenecks to increased renewable energy entering the national grid.
- the state government should invest in infrastructure to enable more renewables to access the grid and work to remove barriers to entry.

EN9: Update the GreenPower framework:

- the GreenPower framework needs to be overhauled so that it is incorporated into the National Greenhouse and Energy Reporting System (NGERS), with the greenhouse benefits and use aspects legally assigned to the paying customer and not all grid customers.
- renewable energy accounting reform is required for GreenPower for it to be of benefit to GreenPower paying customers and so that GreenPower can be an effective part of a low emissions economy for the longer term.
- the state government should promote the use of GreenPower more strongly.

EN10: Develop a transition strategy to phase out coal and gas

The state government needs to develop a comprehensive transition strategy for replacing current coal (see EN2) and gas-fired electricity generation with renewable sources.

In addition:

- the state government should introduce an immediate moratorium on any new coal based electricity generation for South Australia.
- South Australia should change from gas to renewable generation as quickly as possible.
- the state government should ban exploration for and use of unconventional gas until
 - more robust investigation has been conducted into the industry,
- · its low-emission claims are demonstrated and
- its role as a transitional energy source is clearly defined.

EN11: Prohibit the use of nuclear power and phase out uranium mining

The state government should legislate to prohibit the use and development of nuclear power, uranium processing, conversion and enrichment facilities and nuclear fuel fabrication, nuclear fuel leasing and nuclear fuel reprocessing.

Uranium mining should be phased out and no further approvals be granted. If it is to continue, however, it must be managed for the 'least worst outcomes' and the state government must enforce policy standards for the 'strictest environmental conditions' to apply. This includes:

- in-situ-leach (ISL) mining should be banned, with mandatory make-good provisions or required rehabilitation of impacts on groundwater from acid or alkaline leaching and from mine waste disposal. In the meantime, further approvals or development of ISL uranium mining projects should be subject to full Environment Protection and Biodiversity Conservation Act and SA Development Act environmental impact assessment at a full EIS level.
- preventing South Australia becoming 'the radioactive state' by requiring BHP Billiton's Olympic Dam / Roxby mine to:
- only trade in copper and other non-radioactive products
- not export uranium or to sell proposed radioactive copper-uranium concentrates
- leave the uranium and all other radioactive waste at the mine site.
- the Roxby Downs (Indenture Ratification) Act 1982 and the 2011 amendments to the Indenture should be repealed to remove the extraordinary legal privileges granted to BHP Billiton including the override of state legislation that would apply to any other mining venture or commercial activity.

36. © Conservation Council SA 2014 37.

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- requiring BHP Billiton to commit to environmental protection measures to:
- dispose of radioactive tailings into the proposed new Roxby open pit and to rehabilitate the pit should it be constructed
- prevent liquid radioactive waste leakage from tailings piles - including by required lining of the tailings piles
- use renewable energy for the full electricity supply to the proposed new open pit mine rather than the BHP Roxby mine plan, which would see a jump of 12 percent in SA's total greenhouse gas emissions, and to phase out use of fossil fuels for the electricity supply to the existing mine
- stop extraction of Great Artesian Basin waters from Borefield A as soon as possible and phase out rather than expand extraction of GAB waters from Borefield B
- commit to biodiversity projects that genuinely compensate for the loss of flora and fauna caused by the mine project, proposed new open pit and associated operations.
- protect the unique ecology of the Upper Spencer Gulf and the breeding ground of the Giant Australian Cuttlefish by prohibiting the construction of a major desalination plant in this fragile region.

EN12: Update state legislation to improve sustainable outcomes in mining and electricity supply

Several state Acts require amendment to improve sustainable outcomes related to mining and electricity supply:

- the Gas Act 1997 should provide for a commercial energy efficiency scheme to ensure that the main contributors to greenhouse gas emissions are regulated.
- the Mining Act 1971 should prohibit any mining or exploration in National Parks, Conservation Parks and Marine Parks.
- decision-making criteria set out in the Climate Change and Greenhouse Emissions Reduction Act 2007 should support the development of low emissions technologies and manufacturing in South Australia.



Conservation Council SA's planning and development vision CCSA envisages a future where our planning and development creates communities that are largely

CCSA envisages a future where our planning and development creates communities that are largely self-sufficient, with small physical and ecological footprints. This means tackling urban sprawl and car dominance, and creating healthy human-scale environments with abundant localised food production, water harvesting and energy generation.

Current planning and development trends

South Australia's population is increasing. The South Australia Strategic Plan goal is for a population of two million people by 2027⁶⁷. There are wide variations in the state's regional population growth rates⁶⁸. Trends show areas such as Adelaide and peri-urban areas including Mount Barker, the Victor Harbor region and the Barossa Valley are continuing to account for a greater share of the state's population growth, placing pressure on the availability of land and urban services, and increasing tension between competing uses of land and environmental resources⁶⁹. In contrast, many regional urban centres have experienced a decrease in population numbers linked with declining employment opportunities, potentially posing significant problems for the sustainability of these regions⁷⁰.

Greater Adelaide is a city over 100 km in length and 20 km wide. With a population of over a million – approximately 80% of the state's current population - it is a sprawling, low-density, water and energy-hungry, car-dependent metropolis.

This situation is no longer economically affordable, environmentally prudent or sustainable.

Planning and development in a changing climate

Many of the threats that climate change poses will add significant challenges to the planning and development of our cities and regional areas. Threats include more intense heat waves, bushfires and floods. These will all impact on water supply and demand. Potential sea level rise will affect infrastructure and coastal communities will require greater protection from the sea. Additionally there will be increased potential for infectious diseases such as Ross River virus, as mosquitoes and other disease-carrying insects become more abundant with the southwards expansion of tropical zones⁷¹.

We also have to factor in the changes in infrastructure and our energy consumption patterns that are needed to reduce our current emissions of greenhouse gases. Ultimately this means rethinking our entire approach to transport, housing, power and water supply. All of these impact on our planning system, primarily at the state and local government levels.

The current Strategic Plan target of reducing the state's ecological footprint by 30% will only be achieved if there is significant adaptation in South Australia's urban areas. CCSA has great concerns over how we will achieve this in tandem with the target of a population of two million people by 2027⁷².

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⁶⁷ Government of South Australia (2011) South Australia's Strategic Plan 2011, Accessed online < http://saplan.org.au/pages/download-the-plan>

 $^{^{68}\,}Environment\,Protection\,Agency\,(2008)\,State\,of\,the\,Environment\,Report,\,Government\,of\,South\,Australia,\,Adelaide.$

 $^{^{69}\,}Environment\,Protection\,Agency\,(2003)\,State\,of\,the\,Environment\,Report,\,Government\,of\,South\,Australia,\,Adelaide.$

 $^{^{70}\,}Environment\,Protection\,Agency\,(2003)\,State\,of\,the\,Environment\,Report, Government\,of\,South\,Australia, Adelaide.$

 $^{^{77}} Githeko, AK et al. (2000) Climate change and vector-borne diseases: a regional analysis. Accessed online < http://www.who.int/bulletin/archives/78(9)1136.pdf > 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 10$

⁷² Government of South Australia (2011) South Australia's Strategic Plan 2011, Accessed online < http://saplan.org.au/pages/download-the-plan>





What are the key planning and development issues in South Australia?

The key planning and development issues for the future South Australia include:

- the urgent need to reconsider our population target of two million people. We can not sustain a population of this size without radical, long-term changes to our urban and regional areas.
- adapting to global climate change, e.g. the impact of increased instances of flood, bushfire and sea-level rise on built infrastructure and the reduction of habitat for South Australia's species⁷³.
- reducing South Australia's ecological footprint, which currently averages around eight hectares per person. Globally the average is around two hectares per person. Our ecological footprint is influenced by many factors including: our society's size, levels of production and consumption, the efficiency of resource use, the technology used to supply goods and services and the effectiveness of governments in preventing and repairing environmental degradation⁷⁴.
- containing urban sprawl. Growth in population, increased affluence, higher aspirations towards material consumption, structural ageing of the population and lifestyle changes have combined to increase the rate of growth of dwellings in greater Adelaide to well above the rate of population increase⁷⁵.
- preventing further alienation of productive farmland and areas of natural habitat for urban development. A particular consequence of the sprawl of Adelaide is that adjacent productive farmland and natural habitat have been progressively rezoned for housing⁷⁶, diminishing the state's capacity to feed itself.
- reducing our dependence on cars. Our low-density suburbs lock in the waste of water, energy and natural resources and are systematically destroying biodiversity. The story is similar with transport: the further apart our houses are built, the greater the distance we need to travel, generating more greenhouse emissions and air pollution. However, poor public transport in the outer suburbs means people have no choice but to depend on cars⁷⁷.
- reversing rural decline and planning for re-invigorated regional centres.
- preserving and wisely using our natural and cultural heritage: The recent trend towards urban renewal has potential environmental benefits such as reduced greenhouse gas emissions due to shorter travel times, provided that buildings are well-designed. However, urban renewal, if not well managed, can lead to the loss of built heritage⁷⁸.

The urban form we have created is anything but sustainable⁷⁹.

Changing the future - new ways forward

CCSA envisages a future where our planning and development creates communities that operate within sustainable limits and where all developments (residential, commercial and industrial) are energy and water efficient and where possible, self-sufficient.

Our planning must focus on reducing our ecological footprint, including:

- containing our population growth
- reducing the amount of land required to sustain our lifestyle
- reducing our water footprint
- reducing the amount of waste that we produce, including the recycling of non-renewable resources such as phosphorus.
- reducing our energy usage e.g. in housing and transport.

Adapting to climate change must be a key element of the future. This includes:

reversing our trend toward car-oriented development. One
way in which this can be achieved is through well-designed
Transit Oriented Developments (TODs). TODs, if welldesigned, can potentially help to redirect growth away from
unsustainable greenfield sites on the urban fringe (which often
use productive agricultural land) by focusing development
along well-resourced public transport corridors⁸⁰.

⁷³ Government of South Australia (2010) Prospering in a Changing Climate. A Draft Climate Change Adaptation Framework for South Australia, Accessed online https://www.sa.govau/upload/franchise/Water,9620energy9620 and 9620environment/climate_change/documents/adaptation/Draft_Climate_Change_Adaptation_Framework. ordf-

- Department of Infrastructure and Transport (2011), Our Cities, Our Future | A National Urban Policy Framework for a productive, sustainable and liveable future, Australian Government, Accessed online https://www.infrastructure.gov.au/infrastructure/mcu/files/Our_Cities_National_Urban_Policy_Paper_2011_4_
 Sustainability.pdf>
- ⁷⁹ Australian Conservation Foundation (2007) Policy Brief (3.2): Build Liveable Suburbs, Accessed online http://www.acfonline.org.au/uploads/res%5C3.2_Build_Liveable_Suburbs_FINAL.pdf
- Newton, P. et al (2012). Greening the Greyfields: Unlocking the Redevelopment Potential of the Middle Suburbs in Australian Cities. Accessed online < http://espace.library.curtin.edu.au/cgi-bin/espace. pdf?file=/2013/03/28/file 1/190998>

- planning for reduced availability of fresh water supplies. The state government has already mandated rainwater tanks in all new housing developments. This should be extended to commercial and industrial premises. Water management would be enhanced on a broader scale with more harvesting and reuse of stormwater. Design of new buildings should incorporate water sensitive design measures such as re-use of grey and treated water for non-contact domestic uses, water storage in design and landscaping for dry climates.
- planning to protect, maintain and restore endemic biodiversity and habitat, including the provision of biodiversity corridors.
- avoiding development in areas likely to be affected by flooding, sea level rise and extreme bushfires.

Our planning must also provide for a healthy social environment, including:

- respecting the contribution that heritage makes to our community identity and well-being creating a sense of connectedness to places and an appreciation of both built and natural heritage. The value of heritage is in the telling of stories of our landscapes, settlement, skills, state development, industry, cultures and beliefs. Without the knowledge of what went before, we lack understanding of hard-won gains and losses from the past. Heritage gives us a degree of wisdom to avoid past mistakes and to develop resilience for unexpected and unimagined futures. Flexibility of land use in existing heritage listed places, and buildings that support the ongoing retention of the place as well as adaptive re-use, can improve the sustainability of heritage.
- encouraging social cohesion through interaction between members of the community. Suitable amounts of open space and community facilities, well-designed and located, is essential to ensure healthy communities.
- · reducing transport times to work.
- capturing some of the windfall profits achieved through rezoning to fund heritage preservation and potential buybacks of properties in high risk areas, in terms of climate change impacts.

Open dialogue with all key stakeholders is a critical part of any planning process, together with transparency and accountability. Community consultation must be genuine: it must inform decision-making and provide for reasonable feedback to be given. To further ensure fair representation of the environment in planning and development, Category 2 or 3 rights of representation should be provided to allow those affected by a proposed development to be informed and to be heard during the development assessment process. Third party rights of appeal on environmental grounds and in the public interest are essential both for complying development and non-complying development.

Recommendations

PD1: Develop a whole-of-state long-term plan

The government has prioritised the existing 30 Year Plan for Greater Adelaide before regional planning, although it reflects the need to ease growth pressure on metropolitan Adelaide by emphasising the Fleurieu Peninsula, Mount Barker and Murray Bridge. Proper resourcing and a concurrent release of regional plans with a reviewed 30 Year Plan, would provide a whole-of-state approach.

Strategic planning on a state-wide level needs to identify long-term opportunities and constraints in terms of food production, mining, communication, movement, and healthy living in conjunction with the need to sustainably manage natural resources.

Regional plans for the remainder of the state must reinvigorate development in regional areas. In particular, the provision of government services could prioritise regional areas where development is taking place or planned to occur, such as the far North, the West Coast and the mid North. Additionally, the South East region, between Victoria's capital and Adelaide, provides one of the better-watered areas of the state, should be closely considered in a state-wide overview of future sustainable living and resource management.

Fast train links between key regional centres should be factored into future transport planning.

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42. © Conservation Council SA 2014 \$ 43.

⁷⁴ Environment Protection Agency (2003) State of the Environment Report, Government of South Australia, Adelaide.

 $^{^{75}}$ Environment Protection Agency (2008) State of the Environment Report, Government of South Australia, Adelaide.

⁷⁶ Department of Planning, Transport and Infrastructure (2008-2009) Background Technical Report: The Plan for Greater Adelaide, Government of South Australia, Accessed online http://www.dpti.sa.gov.au/_data/assets/pdf_file/0004/94162/Background_technical_report_The_Plan_for_Greater_Adelaide.pdf

⁷ Department of Industry, Tourism and Resources (2007) Biodiversity Management: Leading Practice Sustainable Development Program for the Mining Industry, Commonwealth of Australia, Canberra.



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In addition:

- a whole-of-state plan needs to re-consider the population growth projections in South Australia's Strategic Plan in the light of the state's ecological footprint. Any future population growth must be conditional on a level of consumption that does not further deplete our ecosystems but conserves the natural assets and associated environmental services on which we depend.
- a better Transport Plan should be developed for both greater Adelaide and the rest of the state. This should guide an integrated approach to our movement systems – cars, trucks, train, tram, air travel, bicycle and walking. Key aims should be to reduce the carbon-intensity of our existing transport systems and to improve our approach to public health.
- social infrastructure accompanying built development should be planned for, as well. Social infrastructure provision is integral to the creation of sustainable communities as it contributes much of the glue that holds communities together, providing services and facilities that meet the needs of residents, promote social interaction and enhance the overall quality of life within a community⁸¹.

PD2: Reduce our ecological footprint

South Australia needs to substantially reduce the amount of resources consumed by its citizens, to help ensure it has a viable future. This includes:

- containing our population growth
- fixing the Urban Growth Boundary around Adelaide. Planning policy should prevent any further subdivision or development of prime agricultural land close to urban centres
- increasing residential density within the Urban Growth Boundary through well-designed, thoughtful development which values open space, creates effective communities, provides for at least 15% affordable housing in developments, provides for mixed uses and accessible employment, links provision of key infrastructure and community services to delivery and sequencing of land release and development, protects waterways as green space and biological corridors,

- and provides for local food production. Transit Oriented Developments (TODs) require much more than simply increased residential densities adjacent to major transport routes to be liveable communities
- planning policy encouraging smaller dwellings. Since 2009 new Australian houses have been the biggest in the world measured in floor area terms. The median new house built in Australia is 240 square metres⁸². Such dwellings place greater demands on the environment (water and energy) than smaller ones. At the same time average allotment sizes are falling in line with planning policies promoting urban consolidation. So the result is new dwellings taking up 60-70% of the allotment with clear implications for green space, trees, wildlife habitat and water recycling (see Hall, 2011). Many new houses are also being built without simple passive solar design features such as external shading and good airflow, instead relying solely on airconditioning for climate control.
- requiring all new subdivisions and major developments to develop an Environmental Impact Statement that sets out the reduction in like-for-like ecological, water, energy and waste footprints arising from the development.
- requiring new developments to incorporate water-sensitive urban design elements to minimise water consumption (e.g. permeable surfaces, swales, stormwater capture, grey water reuse and recycling infrastructure).
- the state and federal governments working together with local government to substantially improve the environmental performance standards in the Building Code of Australia. The state government should aim for all of its new buildings to be carbon-neutral by 2016 and commit to retrofitting its existing building stock to improve its performance.
- reducing our dependence on motor vehicles in planning policies and budgets. All levels of government must work together to actively encourage walking, cycling and public transport use i.e. promote a shift away from car-dominated urban communities. This must include designing an integrated network of bike paths and pedestrian walkways separated from motorised transport, within TOD hubs, commercial and retail precincts and residential neighbourhoods. Farmers Markets and group purchasing systems linking local producers and consumers should be

encouraged to feed people on a local basis.

- promoting and extending Adelaide City Council's Free Bike Scheme so that it becomes a viable transport alternative for commuting in and around TOD hubs, as has been demonstrated in many other cities.
- trialling creative mechanisms to reduce car usage. In particular, CCSA recommends that the state government trial substantially increased frequencies of public transport on key selected transport routes – e.g. those associated with TODs – as an alternative to further investment in roads. Encouraging GoGettype car booking schemes through tax and business incentives would enable a more sustainable use of cars when necessary. Additional options include mechanisms that encourage carpooling, priority bus lanes at peak times and congestion pricing.
- planning policy within urban areas to prioritise pedestrians over cars. This might include strict low speed restrictions, traffic lights that prioritise pedestrians and restrict vehicles in certain areas or certain times.
- continuing to encourage the switching of road freight to rail. This will require further investment in rail infrastructure across rural and regional South Australia.

PD3: Plan to avoid climate-change hazards

Climate change appears likely to lead to more frequent and more extreme weather, sea-level rise and the diminution of habitat for endemic species. CCSA recommends that:

- sea-level rise: planning policy should prevent development in areas likely to be inundated by predicted rising sea levels or severely damaged from intense storms. A long-term education program should be developed so that the community and decisions-makers alike are presented with appropriate predictive maps, understand the risks posed by sea level rise, and are encouraged to develop practical responses. CCSA does not support the development of sea walls as a primary method of adapting to sea level rise and recommends that "planned retreat" over time is preferable in terms of environmental impact on coasts.
- flood risk: planning policy should prevent development in areas likely to be flooded.
- bushfire risk: planning policy should prevent additional development in the most bushfire-prone areas. Government should consider buybacks of properties in the riskiest areas, funded in part by capturing some of the windfall gains likely to accrue to owners of sites that are rezoned for higher-density housing.
- habitat: government should actively support the establishment, restoration, protection and effective operation of biodiversity corridors to enable endemic species to move through a greater range of habitats in response to climate change events.

PD4: Protect our native vegetation and biodiversity

Ecological sustainability is an integral part of long-term economic development. Planning and development policies and processes must factor in protection for our native vegetation and biodiversity assets. This includes:

- natural resource accounting principles (where healthy natural environments are ascribed a value for their ecosystem services and public amenity benefits) should be applied throughout the development process.
- the extent and scale of healthy landscapes required to achieve healthy ecosystem function in South Australia needs to be provided for in all key planning and policy documents.
- enabling legislation is required to ensure that biodiversity considerations such as listed species and reserve management plans are adequately considered in processes arising in other areas of legislation.
- biodiversity impacts and natural resource management (NRM)
 objectives need to be considered early in legislatively-required
 processes involved with development projects, such as
 development assessment.
- the Native Vegetation Council should be given prescribed body status within the Development Act 1993.
- rezoning/subdivision of a site should be conditional upon the land undergoing biodiversity assessment to determine if there is significant native vegetation on the site (e.g. significant trees, habitat, species listed under EPBC Act). Legislation should ensure that entire swathes of native vegetation cannot be cleared during a development process.
- the state government should develop a biodiversity offset discussion paper to publicly debate ground rules for the application of an offset scheme and associated guiding principles, developed in consultation with stakeholders and the community.
- biodiversity offset schemes should only be considered as a last resort – not applied liberally in the development assessment process. Where used, they must demonstrate best practice and include adequate monitoring and enforcement.
- The Minister should have the power to disallow a proposed development or development plan amendment that is likely to significantly impact on biodiversity and remnant vegetation.

44. Ocnservation Council SA 2014

⁸¹ British Property Federation (2010). Planning for social infrastructure in development projects in. A guide to tackling the key challenges. Accessed online http://www.bpf.org.uk/en/files/bpf_documents/regeneration/social Infrastructure Report Final.pdf>

^{Australian Bureau of Statistics (2005), Australian home size is growing, Accessed online <a href="http://www.abs.gov.au/ausstats/abs@nsf/Previousproducts/1301.0Feature%20Article262005?opendocument&tabname=Summarusproducts-1301.0E/seture-90058.numer-90168.numer-90168.numer-90169.nu}

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PD5: Use our heritage wisely

South Australia should ensure that its heritage lives, through conservation, exploration of new uses and adaptation. This includes:

- ensuring that local heritage is adequately protected, in legislatively-defined lists
- ensuring that evidence of heritage is retained for future generations – in material and virtual forms, and is easily accessible to the public.
- adequately supporting programs that provide advice and best practice services to owners of listed places – including heritage architects, archaeologists and historians.
- providing incentives to custodians of heritage places e.g. taxation relief, advice, and assistance in finding viable alternative uses that do not compromise the heritage value of the place.
- considering privatisation of heritage places owned by the state government through a system of ownership that allows some ongoing access by the public. Similar systems are used in the United Kingdom, for example.
- considering alternative means of funding heritage support services such as establishment of a Heritage Lottery, with profits dedicated to support of state and local heritage and taxation of development that involves destruction of heritage buildings.
- encouraging communities to celebrate their heritage.

PD6: Improve public participation in the development process

Under the Development Act 1993, opportunities for public participation must be improved to ensure greater public input into the development of planning policy, particularly during development plan amendment and review processes. CCSA believes that a key role of the planning system is to consult effectively, equally and openly with community groups and other stakeholders before changing policy. This means not a process of informing rather than consulting after a decision to change policy has been made. Consultation should be interactive, clearly explain the aims rather than decided outcomes, and be an open two way process for dialogue and information sharing. Existing development assessment notification, representation and appeal processes should be reviewed to establish clear pathways for legitimate concerns by a community over a particular development to be heard and dealt with, before subsequent building works occur – to demonstrate community involvement and impact in outcomes. This includes:

- the present test for joining parties to environmental actions in Court should be expanded to include those who represent the public interest.
- the right to know and right to be represented in respect of certain matters (such as Category 2 and Category 3 developments) should be expanded to ensure that those representing the public interest are heard.
- a public notice should be prominently displayed on any property subject to a development assessment involving a Category 2 or 3 development to ensure that the local community is aware of proposed developments, and where they can obtain further information if they have concerns.
- Development Plan amendments issued under interim authorisation should ensure that the consultation period is neither compromised nor abortive of the ability to fairly consider submissions on the amendments made. The Minister's consideration of submissions and subsequent decision for authorisation of an interim DPA should not be compromised in terms of ensuring the integrity of the consultation process. Mandatory consideration of all views submitted during the interim period, together with the Minister's reasons for decisions in the form of public feedback to submissions, should be accommodated in the process.



WASTE

Conservation Council SA's waste vision

CCSA envisages a time where our society, both consumers and producers, have made the notion of 'waste' a foreign concept. In this society: all materials, including waste, are highly valued resources; manufacturers are responsible for creating products with components that can be reused or recycled; excess consumerism is discouraged and energy is captured from any residual wastes. Importantly, the community's notion of waste production is extended to include the 'waste' produced by its excess use of, for example, contaminated water (directed to treatment plants and the environment) and fuel (through individual car use rather than public transport or cycling).

Current waste trends

The South Australian State Strategic Plan 2011's goal is to aim for zero waste, with a target (Target 67) of reducing waste to landfill by 35% by 2020, and an interim reduction of 25% by 2014. These broad targets are reflected in Zero Waste SA's South Australian Waste Strategy 2011-2015, which breaks down the targets by waste sector. The Strategy also sets the important target of a 5% reduction of per capita waste generation by 2015.

The Environment Protection Authority (EPA), in concert with Zero Waste SA, has worked through policy, legislation and programs towards the state government's goal of zero waste. One aspect of attaining this goal is through the reuse and recycling of materials previously sent to landfill. The SA Recycling Activity Report 2010–11, which reports in conformance with the national Waste and Recycling Reporting Guidelines⁸³, indicates that South Australian recycling rates increased from 72.7% in 2009-10 to 79.9% in 2010-1, continuing the trend from when reporting commenced in 2003-04 (recycling rate 61.5%). Importantly, the per capita recovery rate is some 1930 kg per person, an increase of 15% from 2009-10, and new sources of materials are entering the recovery process (e.g. biosolids).

However, while recycling rates have improved and, overall, less waste is disposed of to landfill, per capita waste generation continues to increase. For the period 2003-04, per capita total waste was 2160kg, which increased to 2310kg/person in 2009-1084, placing South Australians among the highest per capita waste producers in the country. As Australians are among the highest users of electronic goods, with short turnover times of consumer items such as mobile phones and computers, an increase in local e-waste is a growing concern.

While addressing excessive consumption of consumer 'wants' is a key issue for South Australia, as it is in much of the world, it is unlikely that any significant reduction in this consumption will occur quickly while national economies remain stable. Consequently, government and industry (through extended producer responsibility) need to ensure all products are recovered from the waste stream and reused or recycled in an environmentally sustainable manner.

Of the recycled materials collected in South Australia, some 86% is reprocessed locally, 5% goes interstate and the remaining 9% is exported overseas. The quantity of recovered materials exported overseas increased from 251,000 tonnes in 2009-10, to 370,000 tonnes in 2010-11 (SA Recycling Activity Report 2010–11, p.viii). With bans on the disposal of e-waste to landfill, the amount of exported material is likely to increase further. It is known, however, that the reprocessing industry in destination countries such as China⁸⁵ and India is immature, resulting in increased pollution of the environment and impacts on the health of processing workers.

It is important, however, that South Australia ensures that this material is recycled at locations that have the necessary environmental legislation and infrastructure.

Waste in a changing climate

Waste can have an impact on climate change at both a product's production and disposal points. In terms of production, excess consumption leads to higher production levels, which in an industrial society means higher energy use, resource exploitation and pollution. In a changing climate, more consideration needs to be given to the 'prevention' component of the waste hierarchy⁸⁶ by addressing excess consumption.

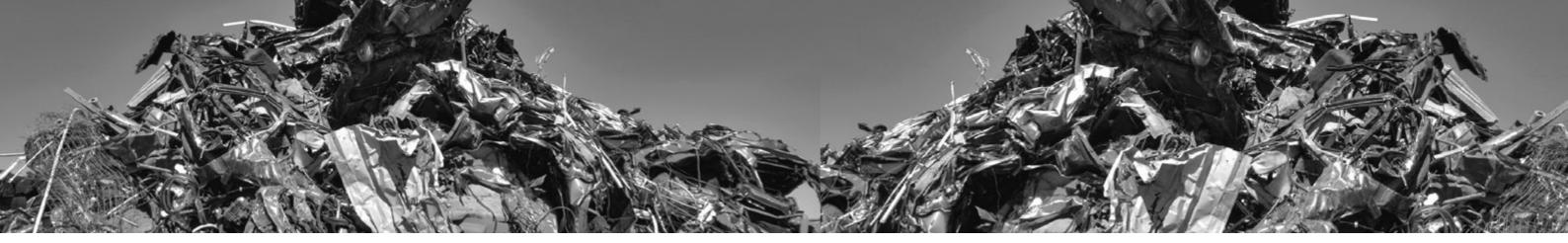
At the disposal end, while consumption has increased, in South Australia (and across Australia) higher separation and recovery rates of materials have diverted increasing amounts of organic material away from landfill, leading to a significant reduction in carbon dioxide equivalent emissions (methane, in particular).

 $^{^{\}rm 83}$ Waste and Recycling Reporting Guidelines (DSEWPC, 2010)

⁸⁴ The anomalous 2010-11 figure was 3250kg/person as a result of the diversion to landfill of a large amount of soil and sediment from major projects where excavations have now been completed.

See for example; Research Report on China's E-waste Disposal Industry, 2013-2017. http://www.businessresearchindustry.com/report/research-report-on-chinas-e-waste-disposal-industry-2013-2017.ht viewed on 12 December 2012.

⁸⁶ The concept of the waste hierarchy forms the essential core of waste management policy in Australia and internationally. (Source SA EPA)



The Australian Bureau of Statistics reported that between 1990 and 2008 there was a 20% decrease in net emissions from the waste sector, the sector's contribution to Australia's total greenhouse inventory declining from 4.3% to 2.6% over this period. Net emission during this time fell from 14.2 million tonnes to 11.1 million tonnes, a reduction of 22%. Importantly, recovered emissions increased from under 1% to 28% by 2008. While these figures are encouraging, more needs to be done to identify and assess old landfills and, where necessary, retrofit methane capture systems.

While moving to greater recovery of materials, not all materials will be recycled fully, in particular the increasing volumes of green and organic wastes. While there is more food and other organic waste being generated at the household level, government urban development policy is towards increased urban consolidation and higher density living. This form of urban development limits the opportunities for the household to reuse organic materials onsite, (e.g. through composting and reuse in gardens) resulting in greater amounts being disposed of through household collection, where contamination (with plastics etc) remains a major concern. While much of this material is currently composted commercially, consideration should be given to utilising these materials to generate energy by the use of bioreactors and bioreactor landfills where the production, capture and use of methane are controlled. Energy generated this way can, in turn, be used to control leachate.

What are the key waste issues in South Australia?

Waste production and management in South Australia and elsewhere are generally considered under three main categories, namely:

- 1. Municipal Waste comprising household kerbside waste collection plus all street and public place waste collection basically all waste collected by local councils. Although recovery rates have increased over time, the total amount of waste also continues to grow including, as noted above, organic materials. The recovered organics for 2010-11 amounted to 440,000 tonnes of "other" organics (10% of all recovered materials) and 230,000 tonnes of garden organics (5% of all recovered materials).
- 2. Commercial & Industrial (C&I) all waste generated by manufacturers, the hospitality industry, offices and all other non-residential operations (apart from the construction industry). Of recovered materials, this sector generated about 1,400,000 tonnes of waste in 2010-11 (32% of the waste stream by weight).
- 3. Construction & Demolition (C&D) wastes comprise materials such as concrete, bricks and timber. Of recovered materials, this constituted 47% of the waste stream by weight.

State and local governments need to ensure that participation by individuals, the citizen-consumer, in the waste management process is made as simple and convenient as possible to eliminate as far as practicable the practice of illegal dumping. Importantly, many items of hazardous waste (such as garden chemicals, medicines, e-waste) are not being disposed of appropriately at present, either through being placed with household rubbish or through illegal dumping, as there are an extremely limited number of appropriate disposal facilities. Where illegal dumping does occur, the EPA should continue to enforce the provisions of legislation with respect to, for example, illegal landfills, hazardous and industrial waste.

A concern relates to illegal dumping of smaller quantities of materials at facilities such as charitable organisations, under the guise of a 'donation' which is essentially rubbish that is sent directly to landfill at a cost to the charitable organisation. At present, such dumping (and also legislation to control littering) is subject to s.235 of the Local Government Act 1999. There is concern that this legislation is inadequate and ineffectively enforced (see recommendation WS2 below) as the penalty for minor littering is up to \$5000 or an expiation fee (on the spot fine) of \$315.00.

While recycling rates in all categories (household, commercial and industrial etc) are improving, litter continues to increase. Much of this litter comprises unsightly materials such as take-away containers and packaging. CCSA's litter concerns relate not only to these materials, but also to other, potentially more serious types of litter such as cigarette butts (where the micro-fibres can find their way to the marine environment via stormwater drains) and used syringes, and to the methods of littering (e.g. materials thrown from cars).

Changing the future - new ways forward

South Australia continues to be in the forefront of waste management within Australia in terms of resource recovery from waste, and has taken the lead in a number of waste management areas such as container deposit legislation and the banning of single-use plastic shopping bags.

The government, in collaboration with key actors in South Australia and across the nation, including the public, should move towards the goal of being the leader in waste management by enshrining world's best practice in policy, legislation and programs and ensuring that the implementation of these are adequately funded at the appropriate functional level (e.g. through local government). These goals may require a greater allocation from the solid waste levy to fund educational and awareness campaigns to change citizen-consumer behaviour.

All institutions within the state; big business, small to medium enterprises, statutory authorities such as the EPA and Zero Waste SA, NGOs, Community Based Organisations (CBOs) and the general public need to play a role in moving towards these goals.

Given this, CCSA is greatly concerned by the state government's decision in late 2012 to abolish Zero Waste SA by 2015. To date, the government has provided no compelling argument for abolishing an organisation that has won world-wide acclaim for its work and is supported by local government and the community.

The proposition that the organisation may be outsourced to some third party without substantial amendment (or repeal) of the Zero Waste SA Act 2004 is extremely questionable. The Act establishes Zero Waste as an instrumentality of the Crown responsible for a number of tasks, including developing a waste strategy for the state. It does not seem feasible for these functions to be transferred to an outsourced, unaccountable body without substantial amendment of the Act.

The decision also gives rise to concerns about the future application of the revenues collected through the waste levy, particularly the significant balance of these revenues held in the Waste Levy Fund. At a time when funding for environmental programs has been steadily reduced by the state government, it is anomalous for this fund to have been allowed to accumulate significant reserves that remain unspent and vulnerable to a grab by the government for other purposes in the future.

Local government has played, and will continue to play, a vital role in waste management in South Australia. With the state government's 30 Year Plan moving towards higher density living, consideration must be given to the practicability of current waste management practices (e.g. the amount of organics and other materials that can be diverted from landfill)⁸⁷. It is essential that local government receives adequate resources from the state government to maintain its role, for example through the solid waste levy.

Importantly, the notion of 'waste' needs to be extended beyond the current categories of municipal, commercial and industrial, and construction and demolition, to include wastewater treatment, marine debris, emerging chemicals of concern and 'wasteful' practices (e.g. excessive water and energy use) in order to move towards a sustainable society.

WS 1: CCSA opposes the abolition of Zero Waste SA and advocates that the government reverse this decision. Increased community participation in waste reduction strategies and effective waste-handling practices needs to be promoted.

CCSA recommends that Zero Waste SA be allowed to continue to operate under its current structure as a statutory authority of the state government, and that it should develop and deliver programs that focus on households reducing the amount of waste produced and give consideration to incentive schemes, such as pay-per-use (adjusted council rates) rubbish collection based on the number and type (general/organic) of bins collected over a period of time.

CCSA proposes that the government provide a wider geographic distribution of readily-accessible Zero Waste/EPA drop-off facilities, to make it easier for people to do the right thing. Consideration should be given to providing these facilities at or near the point where the products are purchased: e.g. drop-off containers for batteries in major shopping centres.

To support community uptake CCSA recommends that government continues to foster understanding of the significance of waste as an environmental issue through investment in a variety of information packages and educational programs.

WS2: Develop adequate and appropriate legislation to manage litter.

CCSA recommends the development of specific litter legislation, either new stand-alone legislation or through an environment protection policy under the Environment Protection Act. The legislation would need to define a range of litter categories, create a range of penalties for these categories and empower a range of office-holders including, for example, park rangers and lifesavers, to ensure compliance.

WASTE

Recommendations

Some for example: Dawkins, E. & Allen, P. 2010 Landfill Ban Investigation. Department of Sustainability, Environment, Water, Populations and Communities. Melbourne: Hyder Consulting Pty Ltd



WS3: Identify emerging wastes and develop policies and strategies to manage these wastes before they impact the environment.

The government, in conjunction with universities and research facilities should:

- Monitor emerging contaminants (such as nanoparticles, pharmaceuticals and personal care products (PPCPs) and antibiotics) that are disposed of as waste, to ensure legislation can manage those risks. An increasing range and volume of these contaminants are passing through our wastewater treatment plants, which were not originally designed for these materials, and are being released into marine and other waters.
- Promote and encourage chemist hand-back schemes for pharmaceuticals.
- Develop a South Australian marine debris strategy.

WS4: Monitor and audit to ensure progress is on track to achieve targets set in South Australia's Strategic Plan 2011 and in South Australia's Waste Strategy 2011–2015.

Progress towards these targets should be monitored and, where possible, achieved at an earlier time by removing barriers identified in the SA Recycling Activity Report 2010–11, for example, barriers to the use of recycled materials and goods by state and local government.

WS5: Ensure that the true cost of waste is factored into waste levies and charges, and reward efforts to minimise the production of waste. Revenue raised from waste levies and charges must be readily accessible for waste reduction and environmental protection programs.

To reduce the volume of material directed into the waste stream, develop incentive schemes, such as pay-per-use rubbish collection based on weight/volume/type.

A limit should be set on the amount of funds allowed to accumulate in the Waste to Resources fund so that the majority of funds are promptly reinvested into appropriate environmental programs.

WS6: Extend strategies to manage organic waste to address sectors currently overlooked.

Support and encourage continued technological development of resource recovery and use of organic material, including animal waste at all scales, including small councils.

It is recommended that educational strategies and programs be developed and delivered to reduce the contamination of organic waste. Funding for such strategies and programs could be sourced from the solid waste levy.

WS7: Maintain South Australia's lead role nationally in encouraging and promoting the reuse of all materials.

Continue to promote the expansion of CDL at the national level. It is recommended that SA take the lead nationally to develop policy and strategies to ensure that exporters ship recovered waste only to receiving countries that have in place environmental practices and safeguards equivalent to Australian practices.

WS8: The state government should act to remove barriers to the full re-use of Commercial and Industrial (C&I) and Construction and Demolition (C&D) waste.

The SA Recycling Activity Report 2010–11 identifies targets⁸⁸ for the diversion of these types of wastes from landfill and also identifies a number of barriers to the use of C&I and C&D wastes. Through Zero Waste, the EPA and other NGOs, including industry bodies, act to remove these barriers.

WS9: Take the lead in promoting extended producer responsibility at the national level.

Ensure that appropriate legislative and policy instruments are in effect in South Australia to support the Commonwealth Product Stewardship Act 2011 (e.g. mirror legislation or amendments to the Environment Protection Act 1993).

Ensure that Zero Waste SA and the EPA collaboratively make representations to the newly appointed Product Stewardship Advisory Group on possible inclusions on the government's proposed annual list of products to be considered for potential product stewardship action. (note: The Advisory Group was appointed on 6 December 2012 and was scheduled to publish its first list of potential products by 30 June 2013).

WS10: Develop legislation, policies and programs to address outstanding issues in site contamination management.

Identify and locate all old landfills of a significant scale, test and monitor for leachate and methane release, and where practicable, require methane capture for all that generate significant emissions. Where practicable, captured methane should be used to generate electricity to power leachate treatment facilities. Address inadequacies relating to the handling of 'orphan sites',

Address inadequacies relating to the handling of 'orphan sites', which are not adequately addressed by the Site Contamination provisions of the Environment Protection Act 1993 (Part 10A).

Prepare amendments to the Development Act 1993 and/or the Development Regulations made thereunder to ensure that actual or potential site contamination is addressed through the development assessment and approval processes, as outlined in the second reading speech when the draft legislation to amend the Environment Protection Act 1993 to introduce site contamination provisions was originally introduced to the South Australian Parliament.

Assess mechanisms to eliminate the disposal of un-remediated contaminated soil and sediments to landfill (e.g. through the exsitu remediation of materials).

Encourage the development of national remediation standards under the National Environment Protection Council Act 1994, which will require the amendments proposed to the Act to be implemented.

WS11: Promote Waste-to-energy policies

Utilise any materials that are not currently recycled, such as increasing volumes of green waste, to generate energy. This would include the use of bioreactors and bioreactor landfills where the production, capture and use of methane are controlled.

As noted under WS 10, consideration to be given to identifying and locating all old landfills of a significant scale to allow methane capture to generate electricity.

 $^{^{88}}$ Zero Waste SA: the targets for diversion by 2015 in metropolitan areas are 75% and 90% for C&I and C&D respectively



Conservation Council SA's water vision

Access to clean water is fundamental to the existence of all life on Earth. The CCSA vision is of a future where our use of water is within sustainable limits, where we have achieved super efficiency and it has become standard practice to reuse all available water as many times as possible. To achieve this vision of a sustainable society, it will be necessary to alleviate the current pressure on natural systems, minimise adverse environmental impacts, and recognise the environment as a priority stakeholder with rights to water.

Current water trends: Unsustainable practices

The world is on the verge of water 'bankruptcy', with humanity's water footprint surpassing all other species combined and threatening natural biological processes across the globe. In South Australia, as globally, our approach to water consumption and management is unsustainable⁸⁹. Environmentally degrading practices include:

- over-extraction from rivers, mostly for the benefit of irrigation and industry;
- pollution of surface and ground waters, which render them unusable and then pollute coastal and marine environments;
- over-extraction of groundwater particularly in the Great Artesian Basin:
- failure to capture and harvest stormwater, causing problems with excessive nutrients and pollution of coastal outflows;
- reducing infiltration and aquifer recharge and maximising run-off through increasingly impervious urban surfaces, roads, carparks, houses, etc;
- relying on major engineering works like dams, regulators and desalination plants to produce, store and manage our water supplies and reducing the use of natural systems. Desalination plants, in particular, are very energy-intensive and increase salinity levels in sensitive gulf areas such as the Upper Spencer Gulf;
- undertaking water-intensive and water polluting mining practices;
- increasing water demand based on profligate usage and lifestyle choices;
- extensive clearing of natural vegetation, allowing salt to rise to the surface. In the Murray-Darling Basin alone, the River Murray now carries an average of two million tonnes of salt per annum from the upstream landscapes to the sea⁹⁰.

Water in a changing climate: A challenging future

Our modern societies have created new pressures on Earth's finite water resources and our future depends on us learning how to use them in a sustainable manner.

The climate of South East Australia is entering into a long-term hotter and drier phase⁹¹. What we are facing is a long-term climatic shift in precipitation patterns that will have corresponding impacts on runoff, infiltration and aquifer recharge. The relationship between reduced rainfall and runoff is not linear. A small reduction in rainfall, especially when combined with higher temperatures, is expected to lead to significantly larger reductions in available water throughout the system for all users, including the environment⁹².

As reflected in recommendation WT6, we are particularly concerned that the current iteration of the Murray-Darling Basin Plan fails to take adequate account of climate change.

What are the key water issues in South Australia?

The River Murray is South Australia's primary freshwater resource, underpinning the ecological health, economic wellbeing and social viability of our state. For the traditional owners, the river is an interconnected complex of spiritual, cultural and economic practices and principles.

The millennium drought highlighted the urgent need for action as the health of rivers, streams and wetlands of the River Murray floodplain declined dramatically due to over-extraction of water from the river system. Salt levels increased and environmental flows, including small and medium pulses, were not delivered. The resilience of the ecosystem was compromised⁹³.

⁸⁹ Barlow, M. (2009) Notes from Opening Keynote at the Australian Water Summit, 1 April 2009.

Murray-Darling Basin Commission (1999), The Salinity Audit of the Murray Darling Basin A 100 Year Perspective, Accessed online < http://www.mdba.gov.au/sites/default/files/archived/mdbc-salinity-reports/439_Salinity_audit_of_MDB_100_year_perspective.pdf>

⁹¹ The Critical Decade 2013: Climate change science, risks and response by Professor Will Steffen and Professor Lesley Hughes (Climate Commission)

 $^{^{92}}$ Bates, B.C., et al. (2008). Climate Change and Water. Technical Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva

⁹³ Environment Protection Agency (2008) State of the Environment Report, Government of South Australia, Adelaide.





While not detracting from the importance of the River Murray as a source of water, it also needs to be emphasised that South Australia is essentially a groundwater state. More groundwater is developed and used than surface water. Many South Australian communities and, some of our major mining and industrial developments, rely on groundwater alone.

The state is also heavily reliant on water that emerges from interstate, and not just in the Murray-Darling Basin. We are the downstream state for several major surface and groundwater systems. This means that it is important to monitor what happens in terms of mining and other development in the Lake Eyre Basin and to pursue cooperative management of the Great Artesian Basin and groundwater systems in the South East on a whole of system basis. It also has to be recognised that the state has limited bargaining power in these areas⁹⁴.

The Onkaparinga, the state's second largest river, has been subject to a similar pattern of use (and abuse) as the Murray. It is treated primarily as an aqueduct between Hahndorf and Mt. Bold, an engineered 'funnel' for delivering water imported from the Murray-Darling Basin into Adelaide's watershed. In the process, its riverine habitats have been grossly degraded, with the annual cycles of high winter flows and low summer flows reversed to satisfy Adelaide's urban consumption. Competing demands from agriculture, industry and urban uses continue to impinge on water quality and flows through the system.

Catchment and riparian areas along South Australia's rivers and creeks are also degraded. They need to be re-vegetated to manage both the quantity and quality of water in watercourses and in groundwater, and also to restore healthy ecological conditions.

South Australia has been a leader in terms of the treatment and reuse of water from sources other than the Murray. Nevertheless there is the potential for the state to greatly increase its use of 'alternative water' such as stormwater and treated effluent and to further develop its expertise and technology in this area. Adelaide currently channels more water out to sea than we use domestically, including treated wastewater, which then wreaks havoc with the ecosystem of Gulf St Vincent. While it is quite fitting for natural watercourses to flow out to sea, this quantity of polluted stormwater is a result of our impermeable urban environment, much of it being water that would previously have infiltrated and recharged groundwater supplies⁹⁵.

South Australia's water strategy, 'Water for Good', is the key policy statement outlining the means to achieve water security for the state within a changing climate. Unfortunately it falls short of implementing the full potential offered by reuse of stormwater and waste water, committing to harvest only limited amounts. There is an exciting opportunity to harvest this stormwater with

the Stormwater Management Authority (SMA) adopting a bigger role with a co-ordinated approach to management. Salisbury Council's innovative success of its stormwater harvesting, reedbed filtration and purification and managed aquifer recharge programs have been followed up by actions in several other council areas. By maximising our rainwater and stormwater harvesting, increasing the efficiency with which we use water and making the most of the creative technology that has been developed and put into practice right on our doorstep, the state can move into a new era of water security without relying on energy-intensive and polluting desalination plants.

Catchments need to be managed on a whole-of-catchment basis, so that all human interferences with natural flows are factored in. There are over 65 major storages and 600,000 private dams throughout the Murray-Darling Basin capable of diverting one and a half times the average flow of every river in the basin, and over 25,560 km of irrigation supply and drainage channels⁹⁶. The successful implementation of the Basin Plan is crucial to effective management of the Murray-Darling Basin.

Further, at a more localised level, the management of the many farm dams in the Adelaide hills and on Kangaroo Island is essential within the water resources regulatory framework. Farmers and other landowners with dams on their property need to appreciate that their damming of water within the catchment has implications for water management and accessibility elsewhere within that catchment, and that regulatory requirements are designed to achieve equity and sustainability across that catchment area.

The South Australian Strategic plan proposes increasing our population to 2 million by 2027, our minerals production and processing to a value of \$10 billion by 2020 and our export income to \$25 billion by 2020⁹⁷. All this growth will inevitably increase our water consumption, unless dramatic measures are taken to reduce consumption elsewhere. These targets in the state's Strategic Plan reinforce the necessity of the state developing alternatives to its traditional historic sources of water. Currently, South Australia is trading off its long-term ecological capital (water resources) for short-term economic gains. However, in the long term, such actions will exact a heavy ecological and economic toll. South Australia's environment has already paid the price, as the disastrous breakdown of the Coorong and Lower Lakes environment in the recent drought highlighted.

Changing the future: new ways forward

The South Australian community needs to embrace a new philosophy of water-respect and water-use, where it ceases to take the supply of water for granted. Instead, it would become 'water wise' and sustainable in its water usage and consumption, recycling as much as practicable, and minimising waste and profligacy. A cultural shift in both the residential and commercial context away from unsuitable landscaping, and the hosing down of driveways and pavement areas, is already underway – we need to ensure it continues.

Ideally, water should be treated as a public trust held for the benefit of both the community and environment, although this aim may have been compromised by the process of privatization which has been undertaken in recent times. It is important that the SA community, state and local government and government agencies understand and accept that managing our water resources to secure both basic human needs and healthy ecosystems underpins the state's economic sustainability and the social fabric of our communities.

The provision of basic human needs and healthy ecosystems should be a priority and water trading should be restricted to any excess, once these needs have been catered for. Ultimately, we need all surface and groundwater resources to be prescribed. Over-extraction must be reversed and more buybacks undertaken (with structural adjustment packages if appropriate) to restore environmental flows and enable communities dependent on unsustainable exploitation of water to develop new efficiencies, new industries or ultimately relocate if necessary. Soil vegetation, riparian zones, wetlands, and estuaries must be restored and protected. It is important to approach decisions on the use and management of water resources by applying a precautionary approach to that decision-making.

Groundwater should be protected from industrial and other sources of pollution (e.g., from fracking and other mining practices), regardless of its location. The movement of water underground is poorly understood and the remoteness or unsuitability of groundwater for human or stock consumption should not be used to justify its contamination.

Desalination as a core strategy for water supply is not supported, other than as a last resort, given its (generally) high-energy costs and potential impacts of waste brine on the environment. In the first instance, other options with a lower environmental and economic cost, such as stormwater harvesting and managed aquifer recharge, should be fully explored.

South Australia's population targets must be compatible with our state's resource capacity – including the levels of water resource available in the future.

Recommendations

WT1: Water must be treated as a public trust

There needs to be informed and ongoing public debate about the privatisation of water resources and its benefits and disadvantages for South Australian society and the environment. Governments must ensure that basic human and environmental rights to water are legally protected and prioritised over commercial interests.

The state government should strengthen its legislation controlling water resources (in particular the Natural Resources Management Act 2004 and the Water Industry Act 2012) by:

- ensuring that whenever decisions are made allowing the diversion of water for human purposes, the diversion will not undermine the sustainability of the environment and its ecosystems
- providing the Natural Resources Management Council with the powers and capacity to oversee the management of water by SA Water and other water industry entities for the benefit of the South Australian community and the environment
- enacting regulations mandating water conservation targets for SA Water and any other water industry entities and, in particular, giving priority to low-tech, low-cost, lowenvironmental impact water harvesting technologies such as stormwater harvesting, wetland purification and storage and water recycling - or give the Essential Services Commissioner the requisite powers in this area.
- requiring SA Water and any other water industry entities to ensure that their infrastructure development and operations are ecologically sustainable.

WATER

⁹⁴ Commonwealth of Australia (2012), Water policy and climate change in Australia, Accessed online http://www.nwc.gov.au/_data/assets/pdf_file/0016/22129/Water-policy-and-climate-change-in-Australia-full.pdf

⁹⁵ SA Water (2005), Water Proofing Adelaide A thirst for change 2005 – 2025, Government of South Australia, Accessed online < http://www.sawater.com.au/nr/rdonlyres/83b05a2e-a3f0-48ee-a640-ca5521a227c0/0/wpa_strategy.pdf>

 $^{^{\}rm 96}$ Personal comment, John Caldecott, July 2009.

⁹⁷ SA Strategic Plan, http://saplan.org.au/targets



WT2: The intrinsic value of water for environmental and human use must be reflected in greater protection of water resources (see also Recommendation BD6):

- All non-prescribed water resources in South Australia should be prescribed under the Natural Resource Management Act 2004, rather than waiting until a water resource is under stress before prescribing it. Prescription would lead to a Water Allocation Plan being developed and those Water Allocation Plans should develop policies and guidelines to ensure the resource is not overused.
- All bores in metropolitan Adelaide must be metered. Users of groundwater should pay a levy under the Natural Resource Management Act 2004, with the income to be used to monitor and manage water appropriately.
- Dumping of waste into groundwater should be made illegal, with no exemptions.
- All the state's watercourses require protection from efforts to interfere with natural flows, and those that have already been degraded need restoration plans to be put in place.
- Urban drains, which have concreted over natural watercourses, such as the Patawalonga and Sturt Rivers, should be dismantled to reinstate natural conditions and utilise natural landforms and processes for harvesting and cleaning stormwater, while retaining efficacy as flood mitigation assets.
- Funding should be provided for revegetation of catchments and riparian areas in order to improve water quality, quantity, flood mitigation, infiltration and salinity levels.

WT3: The South Australian Stormwater Strategy should be implemented in full by government.

This should include:

- developing an integrated blueprint for stormwater and wastewater for Greater Adelaide
- identifying changes required to stormwater infrastructure to improve water quality outcomes and progressively implement them
- developing access rights to stormwater by water industry entities which would occur automatically if all water resources are prescribed
- undertaking research and development to facilitate the maximum safe re-use of stormwater and wastewater, in an ongoing way
- improving the management of flood risk by integrating water re-use and flood mitigation projects, in environmentally sensitive ways.

WT4: Incentives should be used to drive more efficient water use in existing houses and businesses and prevent wasteful water use in new developments.

- The state government should maintain a user-pays water pricing system for commercial and domestic use that reflects the true value of water and increases conservation.
- All levels of government should establish incentives and price signals which encourage the efficient capture, storage and use of water. These may include dual reticulation systems, waste-water re-use, grey water re-use, rainwater harvesting, harvest, storage and purification of stormwater runoff (through managed aquifer recharge), permeable paved surfaces and water-wise landscaping.
- Education of the community and business about the critical nature of wise water use should accompany the incentive schemes.
- Incentives should be provided for research and development into water efficiency innovation. They could include an annual prize, and the research could integrate water efficiency with other environmental factors such as energy efficiency.

WT5: Engineering solutions to water issues should require a full cost-benefit analysis and must be based on best environmental practice.

• These may include, for example: use of natural filtration systems, environmental alternatives to dams, de-centralised water harvesting and recycling systems, small-scale renewably-powered desalination of brackish aquifers and stormwater, and use of 100% accredited Green Power, preferably generated onsite, for desalination plants. Negative environmental impacts on South Australia's water, land and marine ecosystems must be minimised or eliminated through appropriate design.

WT6: The Murray-Darling Basin Plan needs to be strengthened in six key areas.

 Delivering enough water to keep floodplain wetlands healthy and the Murray Mouth open: Sustainable Diversion Limits (SDLs) must be increased beyond 3200GL, towards 4,000GL, until the salinity targets and flow targets for Lakes Alexandrina and Albert and the Murray Mouth are met. Environmental water flows must be protected from evaporation, infiltration and downstream diversions as they move within and between water resource plan areas.

- Planning for climate change: Any reduction in water availability due to climate variability must be shared equitably across all classes of water, including planned environmental water and include an allowance in SDLs for future climate change in accordance with the scenario we are tracking against. All future reviews of the Basin Plan should incorporate the latest scientific knowledge on climate-change impacts, and early reviews should be triggered if new knowledge indicates a significant change in long-term water availability.
- Setting conservative groundwater limits until the science is in Groundwater Sustainable Diversion Limits should be set at precautionary levels and increased access to groundwater should only be considered following new scientific investigation into surface-water connectivity, recharge rates and the environmental water requirements of groundwater dependent ecosystems.
- Overcoming physical and policy constraints to delivering environmental flows: The Constraints Management Strategy must systematically assess and overcome constraints to environmental flow delivery between 2013 and 2019. Clear targets and milestones for implementation and reporting must be incorporated and adequate funds must be allocated by state and federal governments to implement the Strategy.
- Investing in monitoring, evaluation and research so the Basin
 Plan continues to improve: The successful implementation of
 the Basin Plan will rely upon the development and application
 of a credible, well-resourced research, monitoring, evaluation
 and reporting framework. Reporting must be transparent, in
 plain language and publicly available. This framework must
 ensure new knowledge is systematically incorporated into
 river management decision-making processes and community
 engagement and communication programs. Annual MurrayDarling Basin reports must be required to report on progress
 towards both annual and overall targets, with reference to the
 required timeframe.
- Implementing all elements of the Basin Plan by 2019 at the latest: All elements of the Basin Plan should commence at the earliest possibility and no later than 2019. This includes SDLs, the Environmental Watering Plan, Water Quality and Salinity Management Plan, Monitoring & Evaluation Framework and accreditation of new state Water Resource Plans. The Commonwealth Water Recovery Strategy must set out clear targets and timelines to "bridge the gap" between 2013 and 2019.





















SUMMARY OF RECOMMENDATIONS

Summary of recommendations

Sustainability

- SU1: Build a vision for the state that is based on sustainability not economic growth
- SU2: Stop promoting population growth
- SU3: Adopt alternative measures of progress other than GDP
- SU4: Value our ecosystems
- SU5: Build community resilience
- SU6: Increase government transparency
- SU7: Reduce personal consumption

Biodiversity

- BD1: Biodiversity must be the key driver of decision-making under the Commonwealth Environmental Protection and Biodiversity Conservation (EPBC) Act 1999.
- BD2: Develop and implement a climate change adaptation strategy
- BD3: Provide more resources to better manage threats to South Australian biodiversity
- BD4: Strengthen the ability of the reserve system to protect biodiversity
- BD5: Fire management should have biodiversity objectives as a key driver
- BD6: Management of water resources should have biodiversity conservation as a key driver (see also Recommendation WT2)
- BD7: Support community engagement in biodiversity conservation
- BD8: Strengthen initiatives that educate the community about the environment
- BD9: Develop incentives to maintain biodiversity on private lands
- BD10: South Australia's biodiversity legislation needs to be strengthened.
- BD11: Integrated decision-making is needed to support biodiversity outcomes
- BD12: Our planning system should protect our native vegetation and biodiversity (see also the chapter on Planning and Development)

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Coast and Marine

- CM1: Adequate resources must be allocated to monitor and manage marine parks
- CM2: Community (and conservation) involvement in marine parks must be adequately resourced
- CM3: Commercial fishing operations must aim to substantially reduce by-catch
- CM4: Incorporate ecosystem-based models into fisheries management
- CM5: Threatened species legislation must be harmonised
- CM6: Develop a plan responding to sea level rise
- CM7: Improve the quality of coastal waters and estuaries
- CM8: Ensure compliance with aquaculture protocols
- CM9: Recreational fishing must be licensed
- CM10: Management of dredge spoil must be best practice
- CM11: The benefits of a healthy coastal and marine environment must be promoted
- CM12: Support the development of a 'Green Standard' for sustainable harvest of the marine environment
- CM13: The effectiveness of the Biosecurity (pest) strategy must be reviewed
- CM14: Prevent environmental damage from the oil and gas industry
- CM15: The South Australian Marine Parks Act 2007 requires strengthening to achieve its intended goals

Energy

- EN1: Ensure Australia has effective policies to reduce to emissions as quickly as possible
- EN2: Repower Port Augusta by replacing the town's coal-fired power stations with renewable energy.
- EN3: Speed up the move to a clean energy future by tightening the Climate Change and Greenhouse Emissions Reductions Act 2007 and implementing complementary policy.
- EN4: Expand the number of energy-related 'green jobs'
- EN5: Promote energy-efficient living choices
- EN6: Re-invigorate the greening of state government operations.
- EN7: Aim for more fuel-efficient vehicles
- EN8: Expand the role of renewable energy
- EN9: Update the GreenPower framework
- EN10: Develop a transition strategy to phase out coal and gas
- EN11: Prohibit the use of nuclear power and phase out uranium mining
- EN12: Update state legislation to improve sustainable outcomes in mining and electricity supply

Planning and Development

- PD1: Develop a whole-of-state long-term plan
- PD2: Reduce our ecological footprint
- PD3: Plan to avoid climate-change hazards
- PD4: Protect our native vegetation and biodiversity
- PD5: Use our heritage wisely
- PD6: Improve public participation in the development process

Waste

- WS1: CCSA opposes the abolition of Zero Waste SA and advocates that the government reverse this decision. Increased community participation in waste reduction strategies and effective waste-handling practices needs to be promoted.
- WS2: Develop adequate and appropriate legislation to manage litter.
- WS3: Identify emerging wastes and develop policies and strategies to manage these wastes before they impact the environment
- WS4: Monitor and audit to ensure progress is on track to achieve targets set in South Australia's Strategic Plan 2011 and in South Australia's Waste Strategy 2011–2015.
- WS5: Ensure that the true cost of waste is factored into waste levies and charges, and reward efforts to minimise the production of waste. Revenue raised from waste levies and charges must be readily accessible for waste reduction and environmental protection programs
- ** WS6: Extend strategies to manage organic waste to address sectors currently overlooked.
- WS7: Maintain South Australia's lead role nationally in encouraging and promoting the reuse of all materials
- WS8: The state government should act to remove barriers to the full re-use of Commercial and Industrial (C&I) and Construction and Demolition (C&D) waste.
- *WS9: Take the lead in promoting extended producer responsibility at the national level.
- WS10: Develop legislation, policies and programs to address outstanding issues in site contamination management.
- WS11: Promote Waste-to-energy policies

Water

- WT1: Water must be treated as a public trust
- WT2: The intrinsic value of water for environmental and human use must be reflected in greater protection of water resources (see also Recommendation BD6):
- WT3: The South Australian Stormwater Strategy should be implemented in full by government.
- WT4: Incentives should be used to drive more efficient water use in existing houses and businesses and prevent wasteful water use in new developments.
- WT5: Engineering solutions to water issues should require a full cost-benefit analysis and must be based on best environmental practice.
- ₩T6: The Murray-Darling Basin Plan needs to be strengthened in six key areas.

SUMMARY OF RECOMMENDATIONS

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APPENDIX: OBJECTS OF CCSA

Appendix – Objects of Conservation Council SA

CCSA's Policy Principles were developed with reference to the Objects of CCSA in its Constitution. The relevant extract is reproduced below.

Objects of CCSA

- To promote ecological, economic and social planning founded upon ethical principles of environmental protection and conservation;
- To foster protection of Australia's biological diversity and the maintenance of the full range of indigenous species and ecological processes and systems;
- To foster protection of the atmosphere, waters and landforms;
- Promote restoration (or at least stabilisation) of damaged natural environments;
- Foster protection of cultural heritage;
- Promote healthy urban environments;
- Encourage community acceptance of the view that all ecosystems held by both government and private owners, whatever form such tenure may take, are held in trust for future generations; and
- To foster environmental justice.

Without limiting the above objectives or their fulfilment in any way, the Council will pay particular attention to environmental matters in, and promotion of a healthy environment for, the state of South Australia.



Image Acknowledgements

Cover

Bill Doyle, Rawnsley Bluff from the Arkaroo Rock Walking Trail, Wilpena Pound

Acknoledgement: Message from the president

p.2 Bill Doyle, Eckerts Creek, Murray River National Park p.3 Bill Doyle, Adelaide and Mount Lofty Ranges NRM Board, Torrens Outlet

Our Sustainability Vision

p.6 Bill Doyle, Desert Banksias Cox Scrub Conservation Park p.8 -9 Conservation Council SA, Walk Against Warming 2007 p.10-11 Kathy Whitta, Walk against Warming 2007 p.12 Adelaide and Mount Lofty Ranges NRM Board (photography by Bill Doyle), Ship's Graveyard, Garden Island

Biodiversity

p.14 Bill Doyle, Euro Gammon Ranges
 p.16-17 Bill Doyle, Butterflies Mating on Dune,
 Yumbarra Conservation Park
 p.18-19 Kathy Whitta, Grace and Yael at the Bubbler, Mound Springs

Coast and marine

p.22 Alex Sutandio, Jelly Fish, Port Noarlunga p.24-25 Michiel Verhaege, Seahorse p.26 Adelaide and Mount Lofty Ranges NRM Board (photography by Bill Doyle), Tide Line, Webb Beach

Energy

p.30 Department for Transport, Energy and Infrastructure, Wind Farm
 p.32-33 Department for Transport Energy and Infrastructure, Solar Panel
 p.35 Geodynamics Limited, Steam Flow at Habanero
 p.36 Geodynamics Limited, Dr Doone Wyborn, Chief Scientist
 with Separator in Background

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p.40 Geodynamics Limited, Easternwell Drillers on Rig 100 at Jolokia p.42 Kathy Whitta, Tram Pulling up at Station p.43 Adelaide City Council, People Cycling in the Parklands p.44-45 Conservation Council SA, Adelaide Metro Bus

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p.48 Zero Waste SA, Landfill-Compactor p.50-51 Photographer Unknown, Cars p.52 Giuseppina Leone, Household Waste

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p.54 John Hutchins, Whalers Way, Port Lincoln p.56-57 Adelaide and Mount Lofty Ranges NRM Board (photography by Bill Doyle), Onkaparinga Estuary p.58 Bill Doyle, Eucalyptus Coolabah, Coongie Lakes National Park

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p.62-63 Zero Waste SA, bales of recycling

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