

Regional State of the Environment Report 2004-2008

Progressing Sustainability in the Australian Capital Region

The future will bring social, environmental and economic challenges and opportunities to our region but it will also provide opportunities. How well we understand and embrace the challenges and opportunities will determine the future of the region. Addressing climate change and sustainability requires some significant and fundamental change to our planning and decision making processes coupled with actions. With the effects of climate change already being felt, traditional systems or making minor adjustments to business as usual are unlikely to secure an effective and successful future for the region.

While Councils cannot and should not provide all the answers to the many sustainability challenges in the Region, they are a pivotal part of their community and will be looked to for sustainability leadership. Councils need to work with the NSW and ACT Governments, business and communities to progress sustainability and to help build a strong, healthy and resilient Region. This will take innovation, commitment and strong action.

For the purposes of this paper, Councils in the Australian Capital Region (ACR) have been divided into four sub-groups.

Coastal Councils

- *Eurobodalla*
- *Bega Valley*

Alpine Councils

- *Tumut*
- *Tumbarumba*
- *Snowy River*
- *Bombala*
- *Cooma/Monaro*

Major Regional Centre Councils

- *Queanbeyan*
- *Yass*
- *Goulburn/Mulwaree*
- *ACT*

Inland Councils

- *Young*
- *Boorowa*
- *Upper Lachlan*
- *Cootamundra*
- *Harden*
- *Gundagai*
- *Palerang*

These groupings reflect the similar challenges and issues faced by the Councils. Suggestions for actions under each of these groups are not exclusive to the sub-groups and should also be considered by all councils.

For many years the Councils in the Region have recognised that there is much that can be done together rather than on their own. Groups such as the South East Regional Resource Recovery Organisation and Regional Leaders Forum have shown the benefits of Councils pooling resources to achieve

The **Hunter and Central Coast Regional Environmental Management Strategy** seeks to:

- Facilitate the cooperative, regional implementation of environmental management and conservation initiatives,
- Lead by innovation, in order to promote Ecologically Sustainable Development
- Enhance and promote cost effective and sustainable environmental management programs and practices, through regional cooperation in research, capacity building and information exchange between the member organisations.
- Attract funding and resources to the region to research, design and deliver innovation and best practise in environmental management policies, practises and programs.

outcomes. The Hunter Valley is an example of a larger approach to joint action. Recognising the ever increasing pressure on local government to do more with less, the twelve local government areas of the Hunter Valley have pooled resources to address organisational development, environment, procurement and records management. The Environment Division of the Hunter Councils was created in 2004 to provide environmental management support and services for the 12 member councils. The division works to provide specialist support, develop and maintain data and mapping and design and manage of a range of regional environmental projects through the Hunter, in particular in the key themes of biodiversity, water, climate change, weeds, coastal and marine, roadside environment, sustainability, environmental education and compliance.

There is great potential in the Australian Capital Region (ACR) for Regional and sub-regional approaches to achieve needed action. Dr Schooneveldt, in his regional sustainability paper, identified co-ordination of planning especially in the area of water supply, transport and urban development as something that can be undertaken within current administrative arrangements. Increased sharing of social and environmental monitoring and reporting and planning for future community changes such as aging populations presents new challenges that can be addressed on a regional and sub-regional basis.

Four key areas which the Region could initially focus on to prepare for future challenges and to foster sustainable development:

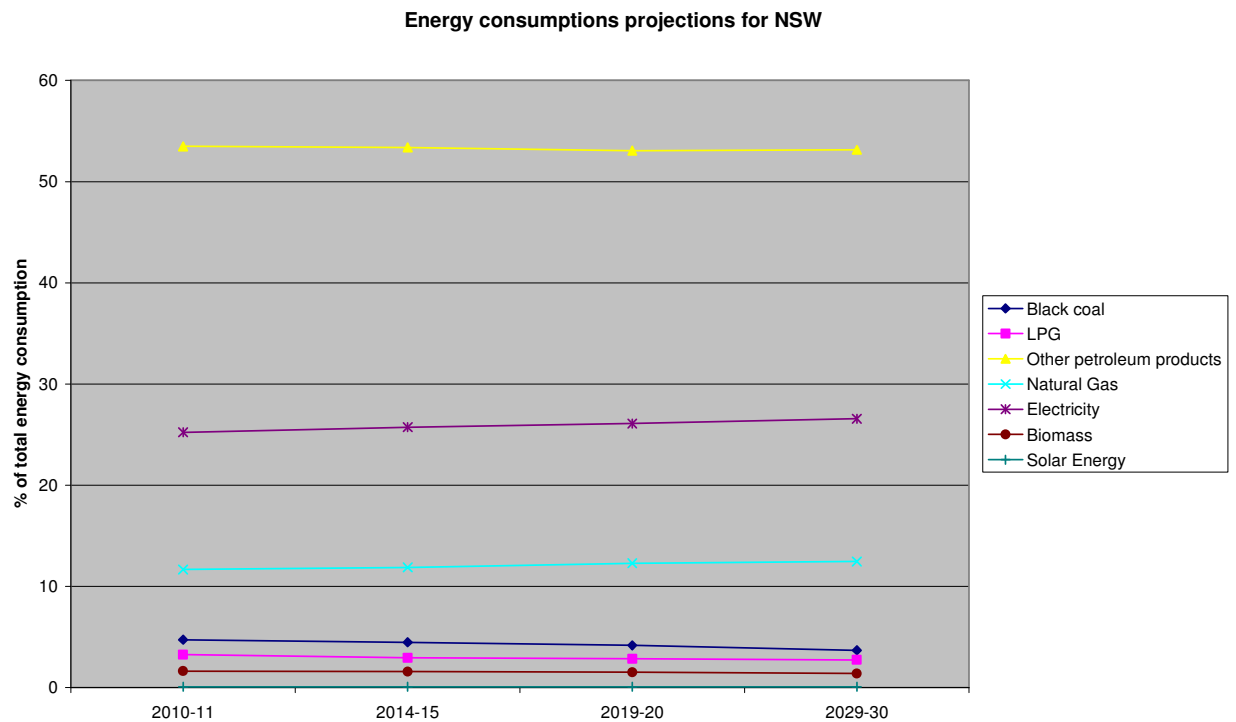
1. Renewable energy
2. Water
3. Land management
4. Building adaptive communities

1. Leadership in Renewable Energy

Energy consumption in NSW and ACT continues to increase with 1,529 PetaJoules being used in 2006/07 up from 1,455.6 PJ in 2000, over half of this consumption comes from black coal¹. In the ACR, future predictions of energy use indicated continued growth of energy consumption dominated by fossil fuel (see Fig 1).

¹ ABARE www.abare.gov.au

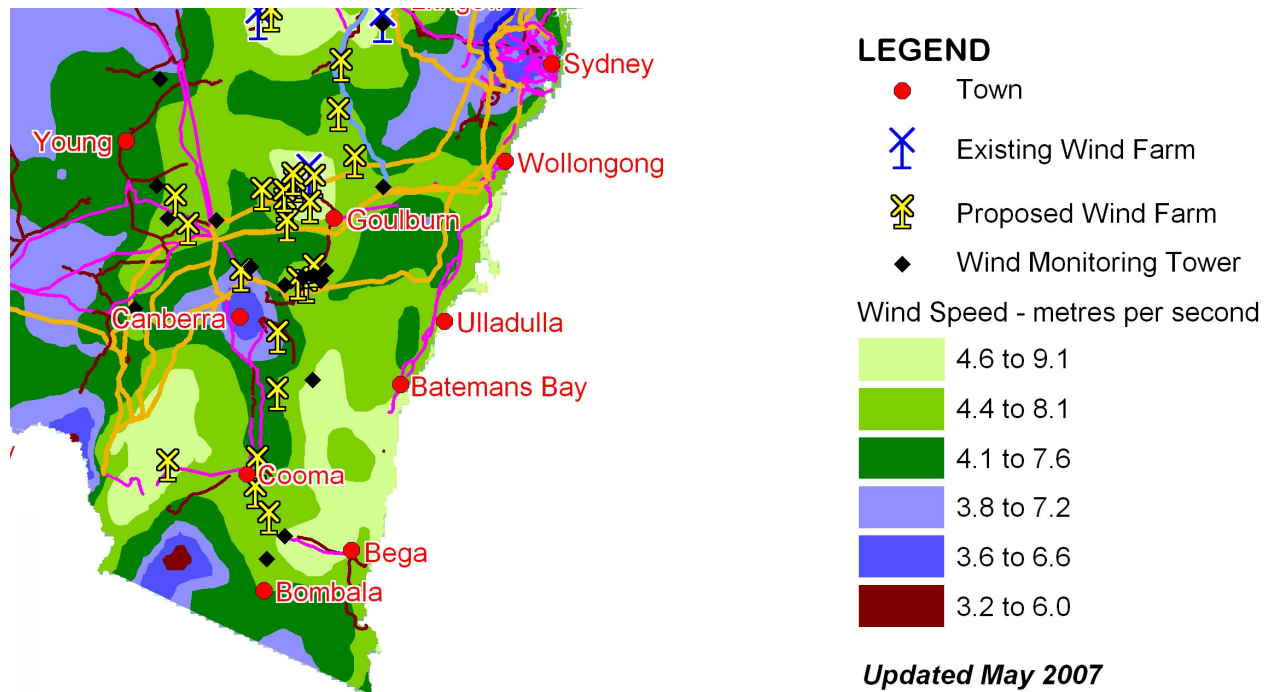
Fig.1 Energy Consumption Projections for NSW



Source: Developed from ABARE data – Energy Consumption Projections for NSW

Under this scenario, any additional renewable energy sources can make an important difference to our greenhouse gas emissions. The ACR has significant potential for wind, solar, hydro and other renewable energy sources. We have some of the best conditions to harness wind power with high wind speeds in much of the region.

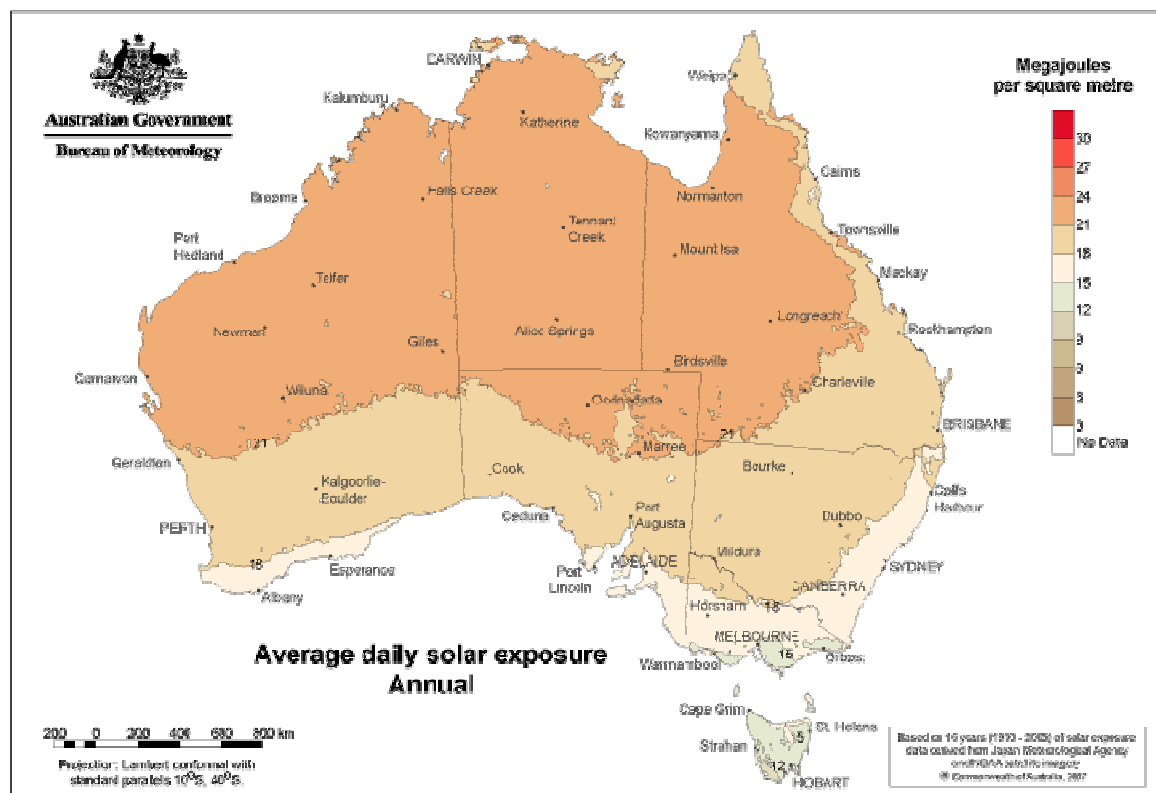
Fig 2. Wind speed and wind farms in the ACR



Source: Adapted from the NSW Wind Atlas © State of New South Wales, with permission from the NSW Department of Water and Energy June 2009

We also have good year round sunlight, making the region ideal for solar energy.

Fig 3. Average Daily Solar Exposure



Source: Australian Bureau of Meteorology

In addition the NSW Government's renewable energy target means that the policy guidance is in place to embrace renewable energy in the region and in fact become leaders in renewable energy production. The NSW Premier's announcement of the South Coast and NSW/ACT Cross Border Region as a Renewable Energy Precinct for wind energy should assist with establishing large scale operation such as windfarms². Current NSW, ACT and Federal Government subsidies for solar panels and solar hot water systems have begun to make small-scale residential solar energy a financially realistic option. Feed-in-tariffs, operational in the ACT and under consideration in NSW, will also support growth of small scale renewable energy.

NSW Renewable Energy target:

- 10% of electricity consumption in NSW by the year 2010
- 15% of electricity consumption in NSW by

We have the environment for fostering a strong renewable energy industry in the region with one of the oldest and largest renewable energy sources in the Snowy Hydro Scheme (capable of producing about 10,335GWh a year³). The Region has about 28 renewable energy power stations (solar, water, wind, biomass etc)⁴.

There is also wind energy being generated from windfarms in the Upper Lachlan Shire and east of Lake George, the ACT has been exploiting the methane gas in landfills for energy for many years and solar farms are being explored in the ACT and Bega Valley. A further 30 renewable energy power stations more proposed for development in the Region⁵. The Region can build on this strong base to create new industries and new and innovative approaches to energy for the future. There are many innovative approaches to energy capture and generation being tested around the world. In the Netherlands for example an office building is harnessing the heat from the road to heat and cool the building⁶. Another example is the USA where they are examining using digesters in dairy farms to extract methane for electricity generation⁷.

Alpine Councils

The Alpine Regions have a great diversity in potential and current renewable energy sources. The NSW Alps has one of the largest renewable energy sources in the country, the Snowy Hydro-electricity Scheme. It also has some very small sources such as the woodwaste biomass plant at Visy Paper in Tumut and the solar panels at Cooma Public School. This diversity of both sources of energy and the size of the energy produced shows what can be achieved in the region.

With significant numbers of tourists coming through the Alpine areas, the councils are in a strong position to highlight the benefits of renewable energy. Actions that Alpine Councils could undertake include:

- Investigating options for large scale wind farms (see map)
- Using planning guidelines to mandate solar hot water in new buildings

² Nathan Rees, 2009

³ data provided by NSW Department of Water and Energy

⁴ DEWHA, 2009

⁵ Ibid.

⁶ The Economist, 2007

⁷ United States Department of Agriculture

- Use planning guidelines to encourage passive solar design and the uptake of solar panel or other renewable where appropriate
- Investigate co-generation or tri-generation for tourist areas where significant areas are heated.

Coastal Councils

The Coastal Councils have been working with actively engaged communities that are very active in promoting renewable energy. Groups such as Clean Energy for Eternity have worked with the community and installed solar panels on community buildings in the area. Beginning in Bega their work has now been embraced by other councils in the region. Their target, supported by Bega Valley and other Councils, of 50/50 by 2020 is ambitious and has already created change and support in the local council and communities. By 2008 10% of the population was using stand alone or grid-interactive renewable energy⁸.

The Coastal Councils are in a good position to build on this support and encourage further progress. Similar to the Alpine Councils they experience high tourism and can use this to promote renewable energy. With an increasing population Coastal Councils will also need to look at alternatives to meet the increasing energy demand. Some actions Council can take include:

- Encouraging investment by renewable energy companies in large scale wind or solar farms in the region
- Continuing to investigate the potential for solar farms in the region
- Using planning guidelines to mandate solar hot water in new buildings
- Using planning guidelines to encourage passive solar design and the uptake of solar panel or other renewable where appropriate
- Continuing to encourage community education and uptake of renewable energy.

Inland Councils

The Upper Lachlan Shire is an excellent example of the potential for large scale renewable energy industry in the Region. They are the vanguard Council in managing local issues associated with wind farms.

Beyond wind and solar potential, with agriculture and timber production in rural areas there is the potential for biomass energy from these industries waste similar to that at Visy Paper in Tumut. These sources not only provide energy but also reduce waste from industry.

Some innovative options for inland councils to encourage renewable energy include:

- Working together through SERROC, investigate options for methane plants at large tips in the region.
- Encourage investment in large scale wind and solar farms where appropriate
- Encourage community education and uptake of renewable energy.
- Investigate co-generation or tri-generation for tourist areas where significant areas are heated.
- Work with relevant local industries to encourage biomass energy potential

⁸ Clean Energy for Eternity, 2008

Major Regional Centre Councils

With significant populations in these councils, the demand for energy both now and in the future is significant. Our region is fortunate to have large metropolitan areas that also have significant open space nearby so larger scale renewable energy such as solar farms are a possibility. There are also other significant options that are being undertaken such as exploiting landfill gas in both the Belconnen and Mugga Lane landfills to create energy, a proposed solar farm in the ACT and solar PV in Queanbeyan.

Importantly for urban populations is the need for planning processes to encourage passive solar design and uptake of solar panels etc. The ACT Government's feed-in-tariff is also a positive step in encouraging individuals to invest in renewable energy.

Actions that can be undertaken in major regional centres to encourage renewable energy include:

- Using planning guidelines to mandate solar hot water in new buildings
- Using planning guidelines to encourage passive solar design and the uptake of solar panel or other renewable where appropriate
- Continuing to encourage community education and uptake of renewable energy.
- Working with businesses to investigate options for co-generation at relevant sites such as hospitals and industrial areas.

2. Being Waterwise

About 7,000 gigalitres of water are extracted on average each year in NSW with 70-80% of this water being used for irrigated agriculture⁹. In recent years, the drought has had a significant effect on water extractions. With the region having a significant agricultural industry, this has had an impact on the regional economy.

The Region is diverse topographically and climatically making rainfall patterns diverse. Average annual rainfall is about 750mm but ranges from over 2000mm in the Snowy Mountains, nearly 900mm in the south coast and hinterland and over 600mm in the lower western slopes¹⁰. Rainfall patterns are also diverse with rainfall falling evenly across the year in the north of the Region, summer-autumn dominant rainfall on the South Coast and winter-spring rainfall dominant in the Monaro, Snowy Mountains and Southern slopes¹¹. This winter snow and rainfall in the Snowy Mountains has crucial to the soils, ecology and economy of the Region.

Water consumption (the water used to produce the foods, good and services we use) per person in the region is generally below the state average of 740,000L/person/year with urban areas such as Yass, Queanbeyan and Palerang having higher use on average than more rural council areas¹². The ACT has a significantly higher use with average water consumption at 860,000L/person/year with some suburbs using over 1mill L/person/year¹³.

⁹ Australian Natural Resource Atlas (2000)

¹⁰ DECC, 2008

¹¹ Ibid.

¹² Australian Conservation Foundation,

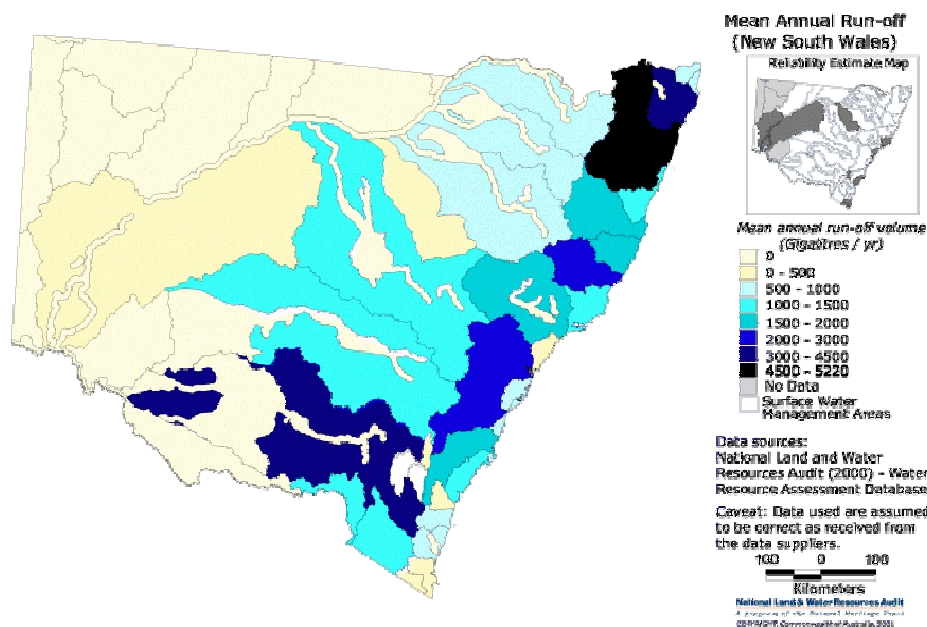
¹³ Ibid.

Future predictions indicate that by 2050 there may be a 20-50% more rainfall in the region in the summer and a 10-50% decrease in rainfall in the winter¹⁴. This fall in winter rain may lead to reductions in snow cover in the Snowy Mountains of up to 85-96% by 2050¹⁵ with implications for ecology, hydrology, soils and economy throughout the Region. It will also have significant effects on water supply in the Region that relies on snowmelts in the Snowy Mountains. We have already seen a reduction in rainfall over the past few decades (see figure below). With changing rainfall and potential decreases in water availability predicted, water will be a significant issue in the Region.

The hydro-illogical cycle

As people become increasingly concerned with an advancing drought, they hope that it might rain and tend to hang on. If the rain doesn't come, the intensifying dry triggers panic reactions, and often very poor policy decisions. If it does rain, everyone breathes a sigh of relief and goes back to business as usual, the possibility of another drought

Fig 4. Mean Annual Run-Off



Source: Australian Natural Resource Atlas

The solutions cannot be addressed purely at a local level as key tools such as water pricing, metering and supply options being beyond the jurisdiction of local Councils. However, community education on water use, protecting and enhancing infrastructure such as stormwater drains and protection of waterways are all important actions for local Councils to manage current and future water availability and use. The Harden Murrumburrah Landcare Group salinity monitoring in Cunningham Creek and the East Jindabyne Residents Committee rehabilitation of Rush's Creek, Jindaboine Creek and the foreshore of Lake Jindabyne are examples of the many community group projects that play an essential role in managing and protecting our catchments throughout the Region. Their work should be acknowledged, supported and encouraged in the Region.

¹⁴ DECC, 2008

¹⁵ Garnaut, R, 2008,pg 135

Alpine Councils

Reductions in winter snow and rain will have significant effects not only on the economy and water availability in the Alpine region but to the whole catchment and Region. Strong water management should not only occur in drought. Work such as the Tumut River Management Plan indicates the importance state and local government are placing on protecting and enhancing waterways in the region.

Actions that can be undertaken to protect and enhance water resources include:

- Continue working with CMA to conserve and sustain the catchment through effective land management
- Continue to work with relevant community groups to improve river health
- Improve data gathering and management to get a clearer picture of catchment health areas of risk
- Continue to work with the community and tourism operators to educate the public on the significance of Alpine waterways and change behaviour to reduce water use and impact
- Developing partnerships with farmers and researchers to continue to improve the efficient use of water in agriculture.
- Continue to examine planning processes to encourage water harvesting (such as tanks), grey water and recycling options.

Coastal Councils

Growing development and populations are a significant challenge for water management in coastal communities. Development results in loss of habitat, and leads to increased extraction of water from rivers for domestic and residential use, increased urban stormwater volume and velocity, as well as increased sewage volumes which have an impact on creeks, coastal vegetation, dune structures and receiving water quality. In addition to the pressure of urban development, agriculture within the Council areas places additional challenges on water management.

The significant work of community groups such as landcare, waterwatch and coastwatch groups in protecting and enhancing the health of waterways is commendable and should be nurtured and encouraged in the Region. Working in partnership with the community, especially community groups and farmers will be essential to future water management in the area. Upgrading infrastructure such as the recent work on sewerage treatment plants and storm water in Bega will continue to be an important role of Council in protecting and enhancing future water supply.

Actions that can be undertaken to protect and enhance water resources include:

- Continue working with CMA to conserve and sustain the catchment through effective land management
- Continue to work with relevant community groups to improve river health
- Improve data gathering and management to get a clearer picture of catchment health areas of risk
- Developing partnerships with farmers and researchers to continue to improve the efficient use of water in agriculture.
- Continue to educate the community on efficient water consumption
- Examine options for use of water recycling within council areas

- Continue to examine planning processes to encourage water harvesting (such as tanks), grey water and recycling options.

Inland Councils

With agriculture being an important industry for inland councils, water use and availability is a significant and contentious issue. The recent restoration of the Bradman Oval in Cootamundra is an example of Councils work to improve local waterways. The focus of the project was the mitigation of the salt runoff from the oval to the nearby creek. The irrigation system for the oval now manages excess surface and ground-water discharge and promotes best-practice watering by sensing climate and soil conditions.

Actions that can be undertaken to protect and enhance water resources include:

- Continue working with CMA to conserve and sustain the catchment through effective land management
- Continue to work with relevant community groups to improve river health, in particular to reduce carp numbers
- Improve data gathering and management to get a clearer picture of catchment health and areas of risk
- Developing partnerships with farmers and researchers to continue to improve the efficient use of water in agriculture.
- Examine options for use of water recycling within council areas
- Continue to examine planning processes to encourage water harvesting (such as tanks), grey water and recycling options.

Major Regional Centre Councils

Growing populations in major regional centres place greater demand on water, both through increased water use and through the impacts of urban areas on waterways. Councils need to balance the increasing demand of urban areas with the significant challenges of water use in agriculture. Community education and behaviour change programs such as the work with Yass Schools with the storybook/colouring book "The Clean and Green Gang – Discover Ways to Save Water" are essential to creating communities that will manage water now and into the future.

Actions that can be undertaken to protect and enhance water resources include:

- Continue working with CMA to conserve and sustain the catchment through effective land management
- Continue to work with relevant community groups to improve river health
- Improve data gathering and management to get a clearer picture of catchment health and areas of risk
- Developing partnerships with farmers and researchers to continue to improve the efficient use of water in agriculture.
- Examine options for use of water recycling within council areas
- Continue to examine planning processes to encourage water harvesting (such as tanks), grey water and recycling options.
- Improve understanding of the impacts of urban areas on waterways and develop planning processes to develop healthy urban environments.

3. Managing Our Land Sustainably

This State of the Environment Report has highlighted some significant gaps in our knowledge of land use changes and land degradation in the Region. Pressure points on land throughout the region include:

- Land clearing
- Over use of fertilisers
- Unsuitable use of land
- Altered water tables
- Fire
- Drought conditions
- Climate change impacts
- Land development

With our natural assets creating the basis for both tourism and agricultural industries as well as making our Region such a desirable place to live, it is essential that we effectively manage and protect our land. This can only be achieved in partnerships, both partnerships between governments (both state and local and within the region) and with community and industry groups. Upper Lachlan's Biodiversity Planning Framework shows how local councils, state government and CMAs can work together to develop strong land management plans in the Region.

With growing and changing populations, we need to be clever in how we plan and develop our communities. Palerang Council has recently been addressing these issues with their rural residential developments aiming to facilitate appropriate development, leading to improvements including: regeneration of native grasses and trees; decreased weed problems due to reduced grazing pressures and more intensive land management. There is replanting of native vegetation particularly trees and shrubs and increased permanent aquatic habitat provided by farm dams, albeit at the cost of reduced stream flows. In some places, there are now pockets of higher value agricultural production, such as grapes and olives.

Growing urban and rural residential populations need to be planned with consideration given to fire vulnerability, water availability, and the impact of urban and peri-urban areas on ecosystems, ecological connectivity and waterways. These issues stretch beyond Council boundaries. The impact of an urban settlement can be felt on waterways well down stream on other local council areas. Difficult strategic decisions on issues such as regional ecological connectivity, growth patterns and development policies need to be at a regional scale to determine future sustainable growth in the Region.

Planning systems are becoming more strategic and inclusive. For example the recent Yarrolumla Development Control Plan for Rural Zones in Palerang takes into account erosion and sediment control, energy efficiency, bush fire protection and fire fighting resources, threatened species, vegetation protection and noxious weed control.

However, we still need to address contentious issues such as whether we should build at all in flood and fire prone areas. The recent fires across our region and inter-state have the importance of these complex issues.

4. Building a Climate Resilient Community

Climate change and variability has become an increasingly important issue in this reporting period and will continue to present challenges and opportunities in the region

into the future. In his Report, Professor Garnaut has identified a number of potential impacts if greenhouse gas emissions continue without unabated that will have a significant affect on the region. These include:

- Tourism - Beach based activities, wildlife watching, trekking, camping, climbing and fishing may increase outside the hottest times of the year due to predicted drier and warmer conditions. However there are risks to tourism from increased weather events such as storms and fires¹⁶. Tourism in the alpine shires is likely to be significantly impacted from climate change¹⁷.
- Coastal infrastructure - Coastal shires may face increasing costs as increases in the magnitude of storm events and sea-level rise damages coastal infrastructure¹⁸.
- Biodiversity and ecosystems - Climate change will intensify the challenges already facing biodiversity and ecosystems such as widespread loss of native vegetation and habitats, reduction of water quality and availability, isolation of habitats and ecosystems, and the effects of plant and animal pests. Alpine species are particularly at risk as the range of their habitats is already limited. Disruptions to natural ecosystems and biodiversity will also have a flow on effect to the natural assets that we value such as clean air, clean water and fertile soil, all of which contribute directly to human health and wellbeing.¹⁹
- Urban water availability - By 2030 the ACT region may face moderate increase in capital and operational expenditure with a minor change to cost structure of the water infrastructure. By 2100 this impact increases from moderate to extreme.²⁰

The region has a role to play in reducing emissions to mitigate future climate change. In doing this, an important first step is to have a clear understanding of the emissions profile at a council and regional level. This can assist in better focusing mitigation efforts. However it is also important to recognise that significant mitigation can only be truly effective if it is addressed on a national and global scale.

As the impacts of climate change are complex, so the responses need to be different depending on the region and community. As such, adaptation efforts need to be focused not just nationally but at a regional and local level. At a local level, Councils will play a pivotal role in providing direction for adaption in their community and working with communities, individuals, NGOs and businesses to develop a resilient community.

Understanding the Region's vulnerability to climate change is the first step in developing programs for adaptation. The Sydney Coastal Councils have tackled this issue by working together and partnering with CSIRO's Climate Adaptation Flagship and working in collaboration with the University of the Sunshine Coast to undertake research on regional approaches to managing climate vulnerability in the Sydney region. This Regional approach not only pools resources to undertake this research but also will provide them with a strategic and regional response to climate change which provides consistency not only to councils but also to the community.

A similar approach in the ACR would also assist Councils which face competing priorities and limited resources to focus and prioritise adaptation in the region. The ANU is currently

¹⁶ Garnaut, R (2008) pg 133

¹⁷ Ibid. p 135

¹⁸ Ibid. p138

¹⁹ Ibid. p141

²⁰ Ibid. p 136

working with the ACT and NSW Governments on the Climate Vulnerability and Adaptation in the Australian Capital Region Project. Phase one of this project will be completed in late 2009 and will provide an library of work being undertaken in the Region on climate change vulnerability and adaptation. It would be a useful tool for Councils in scoping information and knowledge gaps in the region in relation to climate change adaptation and vulnerability. It will focus on four key areas²¹:

- Social and health
- Water
- Fire regimes
- Governance, policy and law.

This project would be an important in developing a strategic approach to adaptation in the Region. The inclusion of renewable energy may add strength to this work.

Many Councils in the Region have begun to embed sustainability in their own operations and decision making. In leading the community in sustainability and adaptation, this is an essential first step. Outside the ACR, an effective example of this is the work of Kiama Municipal Council, Shell Harbour City Council and Wollongong City Council. With the support of the NSW Government, through the Environmental Trust, these councils have worked together to create the Illawarra Sustainability Roadmap. The roadmap provides a strategic direction for the Councils to work on sustainability and gives leadership and consistency to the community on sustainability. Taking an integrated approach to sustainability both in communities and within the Region will help make the ACR a strong and liveable community in the future.

²¹ Personal correspondence with ANU Climate Change Institute.

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