

STANDING COMMITTEE ON CLIMATE CHANGE,
ENVIRONMENT AND WATER

**Inquiry into the ecological carrying capacity
of the ACT and region**

DISCUSSION PAPER

OCTOBER 2010

The ACT Legislative Assembly's Standing Committee on Climate Change, Environment and Water invites feedback on the matters raised in this Discussion Paper.

Written submissions should be lodged by **12 November 2010**, however extensions may be granted. Submissions should include your full name, postal address, telephone number and email address. Submissions can be sent to the following email address: committees@parliament.act.gov.au

The address for correspondence is:

**The Secretary
Standing Committee on Climate Change, Environment and Water
Legislative Assembly for the ACT
GPO Box 1020, CANBERRA ACT 2601**

Further information about making submissions is available from the Committee Office by telephone on (02) 6205 0136 or by visiting the Committee Office web page www.parliament.act.gov.au

Committee membership

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Resolution of appointment

On 9 December 2008, the ACT Legislative Assembly agreed by resolution to establish general purpose standing committees to inquire into and report on matters referred to it by the Assembly or considered by the committee to be of concern to the community, including:

(f) a **Standing Committee on Climate Change, Environment and Water** to examine matters related to climate change policy and programs, water and energy policy and programs, provision of water and energy services, conservation, environment and ecological sustainability.

The Assembly agreed that each standing committee can consider and make use of the evidence and records of the relevant standing committee appointed during the previous Assembly.¹

Inquiry terms of reference

On 4 August 2010, the Standing Committee on Climate Change, Environment and Water resolved that:

- 1) The Committee inquire into and report on the ecological carrying capacity of the ACT and region including the following matters:
 - a) The resources available to the ACT in terms of water, energy, and food sourced from within the Territory and outside it;
 - b) Effective measures for assessing ecological footprint and carrying capacity;
 - c) Current levels of resource use by ACT residents, including:
 - i) The current size of the ACT urban, ecological and carbon footprints and how this compares to national averages and similar sized cities globally; and
 - ii) Trends in resource use in the ACT and the sustainability or otherwise of these trends continuing.

¹ Legislative Assembly for the ACT, *Minutes of Proceedings No 2*, 9 December 2008, pp 15-18.

- d) A sustainable level of resource use, in terms of ACT urban, ecological and carbon footprints, for the ACT;
- e) Appropriate ecological carrying capacities based on current, higher and lower consumption models;
- f) Effective measures for reducing the ACT's ecological footprint;
- g) The environmental, economic and social impacts of reduced resource consumption and a sustainable population;
- h) The role of the ACT in the region in relation to population and resource use;
- i) Relevant infrastructure issues; and
- j) Any other relevant matter.

Definitions

ACT and region	Refers to the Australian Capital Region which comprises the ACT and the 17 surrounding local government areas.
Carbon footprint	The amount of carbon being emitted by an activity or organisation (usually expressed in tonnes).
Carrying capacity	Defined as the maximum population size that can be supported indefinitely without degrading resources. Carrying capacity of a given region may be influenced by a number of factors and may change over time as a result of environmental changes, population growth and technological advances.
Ecological footprint	Measure of the area of land needed to support the lifestyles of urban residents; it includes raw materials for food, building, energy and so on, as well as the area required to absorb the carbon dioxide emitted from the consumption of resources. ²
Ecological overshoot/deficit	Occurs when a population's demand on an ecosystem exceeds the capacity of that ecosystem to regenerate the resources it consumes and to absorb its wastes. ³

² Office of the Commissioner for Sustainability and the Environment, *Annual report 2008-09*, September 2009, p 20.

³ Global footprint network website – accessible at:
http://www.footprintnetwork.org/en/index.php/GFN/page/frequently_asked_questions/

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1 INTRODUCTION

Conduct of the inquiry

- 1.1 On 4 August 2010, the Standing Committee on Climate Change, Environment and Water resolved to inquire into the ecological carrying capacity of the ACT and region. The Chair of the Committee informed the Legislative Assembly of the resolution on 17 August 2010.⁴
- 1.2 The issues outlined in the terms of reference are wide ranging. As part of the inquiry process, the Committee has prepared this discussion paper to provide additional information about the terms of reference and some of the key issues. It is anticipated that this information will assist individuals and organisations with the preparation of submissions.
- 1.3 The Committee invites interested parties to submit comments on any of the issues raised in this paper or any other issue they consider relevant to the terms of reference of this inquiry.
- 1.4 The Committee expects to hold public hearings for the inquiry in the first half of 2011. Information about public hearings will be provided on the inquiry webpage at the following location:
<http://www.parliament.act.gov.au/committees/index1.asp?committee=112>.

Structure of the discussion paper

- 1.5 A list of definitions has been included in the front section of the paper.
- 1.6 This first chapter provides general information about the inquiry and the structure of the discussion paper. The remainder of the paper is structured as follows:
 - Chapter 2 provides additional detail about some of the key issues and themes for the inquiry;

⁴ Legislative Assembly for the ACT, *Minutes of Proceedings No 69*, 17 August 2010, p 791.

- Chapter 3 outlines additional information about the terms of reference including a number of discussion questions; and
- Chapter 4 concludes the paper with general advice about making a submission to the inquiry.

2 MAJOR ISSUES AND THEMES

- 2.1 The terms of reference for this inquiry define the major issues being considered including:
- Assessing and reducing the ACT's ecological footprint;
 - Current resource use and the impacts of reducing consumption;
 - Population of the ACT and surrounding region;
 - Sustainability, consumption and population; and
 - Current and future infrastructure needs of the ACT.
- 2.2 This section of the discussion paper provides additional information about some of these key themes and provides some context to the discussion questions outlined in chapter three.

The ACT and region at a glance

- 2.3 For the purposes of this inquiry, 'region' broadly refers to the Australian Capital Region. The Australian Capital Region (ACR) comprises the ACT and 17 surrounding local government areas in New South Wales. A list of the 17 councils as well as links to their websites is included at Appendix A.
- 2.4 The ACR has a total area of 6.7 million hectares and a population of 571,561 people: a population density of around 11 hectares per person. It is the third most populous non-metropolitan region in Australia: the NSW Hunter region (626,000) and the Queensland Gold Coast (903,000) are both larger and more densely populated.⁵
- 2.5 The ACT has strong links with the region. The region is an important source of labour with approximately 31,800 people working in the ACT but resident outside the ACT. The quality of life of ACT residents is enhanced by access to the recreational opportunities and the natural environment in the region. The

⁵ Schooneveldt, J, *Regional Sustainability*, accessible at:
http://www.envcomm.act.gov.au/soe/rsoe2009/overview_schooneveldt.shtml.

bulk of the ACT's water supply comes from dams within NSW and the ACT relies on power generated from external sources.⁶

Carrying capacity

- 2.6 Carrying capacity is a term used to describe the maximum population size of a given species that can be supported by a given area without depleting resources. Carrying capacity of a given region may be influenced by a number of factors and may change over time as a result of environmental changes, population growth and technological advances.
- 2.7 Another definition states that carrying capacity is 'the maximum rate of resource consumption and water discharge that can be sustained indefinitely in a given region without progressively impairing the functional integrity and productivity of relevant ecosystems'.⁷

Sustainability

- 2.8 Sustainability is a concept that has been subject to numerous discussions and produced many definitions. The essence of environmental sustainability is reflected in the commonly understood and valued principles of:
- intergenerational equity;
 - the precautionary approach; and
 - biodiversity conservation.⁸
- 2.9 Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. A focus on sustainability recognises the interdependence of

⁶ Regional Development Australia ACT, *ACT Strategic Plan 2010*, 2010.

⁷ Simpson, R, Petroeshevsky, A & Lowe, I, 'An ecological footprint analysis for Australia', *Australian Journal of Environmental Management*, vol.7, March 2000.

⁸ Environment and Natural Resources Committee, Parliament of Victoria, *Inquiry into sustainable communities* (2005) pp 13-14.

social, economic and environmental well-being as well as an understanding of how one individual's (or community's) actions may impact on others.⁹

- 2.10 Sustainability can be assessed using a number of different indicators such as ecological footprint, wellbeing assessment, ecosystem assessment and Sustainable Human Development Indicators. Sustainability indicators may serve a dual function – that of providing tools to measure sustainability as well as guiding decision making and policy development.¹⁰
- 2.11 The measurement of ecological footprint is probably the most well known of the sustainability indicators.

Ecological footprint

- 2.12 The assessment of 'ecological footprint' measures the area of land needed to support the lifestyles of urban residents; it includes raw materials for food, building, energy and so on, as well as the area required to absorb the carbon dioxide emitted from the consumption of resources.¹¹
- 2.13 Carbon footprint is more specific and is used to describe the amount of carbon (usually in tonnes) being emitted by an activity or organisation.¹²
- 2.14 The ecological footprint is expressed in 'global hectares', where one hectare of biologically productive space with 'world average productivity' is equal to one unit. Calculating the size of the ecological footprint provides a rough measure of the extent of human impact on the earth.¹³
- 2.15 Measuring ecological footprints includes aspects of resource consumption and waste production that are potentially sustainable – it shows resources that

⁹ United Nations, *Our common future: Report of the World Commission on environment and development*, accessible at: <http://www.un-documents.net/ocf-02.htm>.

¹⁰ Wanner, T, 'Leaving green footprints: South Australia's strategic plan and ecological footprint', *South Australian Geographical Journal*, vol. 107, 2008, p 90.

¹¹ Office of the Commissioner for Sustainability and the Environment, *Annual report 2008-09*, September 2009, p 20.

¹² Global footprint network, *Carbon footprint*, website accessible at: www.footprintnetwork.org

¹³ Office of the Commissioner for Sustainability and the Environment, *ACT State of the Environment 2007/08*, accessible at: <http://www.envcomm.act.gov.au/publications/soe/2007actreport>.

within given limits can be regenerated and broken down into waste.¹⁴ There are two standard ways of drawing boundaries for studying ecological footprint:

- Consumption footprint – measures all consumption in a given area no matter where the goods are produced;
- Production footprint – measures all that is produced in a given area no matter where consumed¹⁵

2.16 In 2007 the ecological footprint for Australia was 6.4 hectares per person.¹⁶ Using the same methodology, the ACT's footprint was 8.7 hectares per person (the highest in Australia) while the rest of the ACR was below the national average at 5.96 hectares per person. Ten years earlier using a slightly different methodology, the CSIRO and University of Canberra calculated Canberra's footprint as 4.44 hectares per person, a doubling in a decade.¹⁷

2.17 There are a number of contributing factors to the territory's ecological footprint:

- what we use, (e.g. phones, banking, entertainment and government services),
- what we eat and where it comes from,
- transport,
- the energy we use, and
- the things we buy and where they come from.¹⁸

2.18 The assessment of ecological footprints is becoming more widely used as a measurement tool and to inform policy development and decision making. For example, in 2005 Environment Protection Authority Victoria commissioned a

¹⁴ Global Footprint Network and the University of Sydney, *The ecological footprint of Victoria, assessing Victoria's demand on nature*, October 2005, p 10.

¹⁵ Global Footprint Network and the University of Sydney, *The ecological footprint of Victoria, assessing Victoria's demand on nature*, October 2005, p 19.

¹⁶ Australian Conservation Foundation, *Consuming Australia: Main findings*, 2007, accessible at: http://www.acfonline.org.au/uploads/res/res_atlas_main_findings.pdf.

¹⁷ Schooneveldt, J, *Regional Sustainability*, accessible at: http://www.envcomm.act.gov.au/soe/rsoc2009/overview_schooneveldt.shtml.

¹⁸ Office of the Commissioner for Sustainability and the Environment, *ACT State of the Environment 2007/08*, accessible at: <http://www.envcomm.act.gov.au/publications/soe/2007actreport>.

study to produce a robust assessment of Victoria's ecological footprint by addressing the following aims:

- Calculate the ecological footprint using two different methods; and
- Assess the strengths and weaknesses of the two approaches in the context of making the two methods more compatible and consistent.¹⁹

- 2.19 There has also been some work done in South Australia to facilitate the practical application of information about ecological footprint to policy development and strategic planning.²⁰
- 2.20 It is recognised that measuring ecological footprint is not a complete assessment of sustainability. A number of other measures may also be required to gain a more comprehensive picture of sustainability. The most appropriate methodological approach may be dependent on the context and particular situation.²¹
- 2.21 One of the key components of assessing ecological footprint is measuring consumption. For example, the consumption (and transport) of food comprises the largest proportion of Australia's ecological footprint.²² Consumption is an important component of initiatives that seek to reduce ecological footprint.²³

Resource use

- 2.22 In general, households with higher incomes are buying and consuming more than low income households. This trend may be particularly relevant for the ACT due to the high number of high income households. Furthermore, there is

¹⁹ Global Footprint Network and the University of Sydney, *The ecological footprint of Victoria, assessing Victoria's demand on nature*, October 2005, p 6.

²⁰ Wanner, T, 'Leaving green footprints: South Australia's strategic plan and ecological footprint', *South Australian Geographical Journal*, vol. 107, 2008, pp 86-102.

²¹ Global Footprint Network and the University of Sydney, *The ecological footprint of Victoria, assessing Victoria's demand on nature*, October 2005, p 79.

²² Simpson, R, Petroeschevsky, A & Lowe, I, 'An ecological footprint analysis for Australia', *Australian Journal of Environmental Management*, vol.7, March 2000, p 13.

²³ Wanner, T, 'Leaving green footprints: South Australia's strategic plan and ecological footprint', *South Australian Geographical Journal*, vol. 107, 2008, p 98.

a strong correlation between increasing wealth and increasing greenhouse pollution and water use.²⁴

- 2.23 With the exception of water, Canberrans use of most resources has increased.²⁵ Despite high levels of recycling in the ACT, Canberra's total waste has increased by 87% (408 624 tonnes in 1994-95 to 764 058 in 2006-07) while population growth has increased by around 10%.²⁶
- 2.24 A survey conducted by the Australia Institute in 2005 found that residents of the ACT are the most wasteful in Australia, spending on average \$1475 per year on unused goods, 20 per cent higher than the national average of \$1226.²⁷

Greenhouse Gas Emissions

- 2.25 Key findings reported in the *ACT Greenhouse Gas Inventory 2008* include:
- The ACT's greenhouse gas emissions were 4.15 million tonnes CO₂-e in 2008, a 1.2% reduction on the emissions (4.23 million tonnes CO₂-e) for 2007;²⁸
 - Although the trend shows two years of emissions reduction since 2006, the level of emissions for 2008 is still in line with the long term trend with a 12% increase on 2000 and 29% on 1990 levels respectively; and
 - The ACT produces the lowest per capita emissions of all Australian states and territories, at 12.1 tonnes CO₂-e per person in 2008, a reduction of 2.9% since 2007. This is largely because the ACT has very small manufacturing and agriculture sectors.²⁹

²⁴ Australian Conservation Foundation, *Consuming Australia: Main findings*, 2007, accessible at : http://www.acfonline.org.au/uploads/res/res_atlas_main_findings.pdf.

²⁵ Office of the Commissioner for Sustainability and the Environment, *ACT State of the Environment 2007/08*, accessible at: <http://www.envcomm.act.gov.au/publications/soe/2007actreport>.

²⁶ Office of the Commissioner for Sustainability and the Environment, *ACT State of the Environment 2007/08*, accessible at: <http://www.envcomm.act.gov.au/publications/soe/2007actreport>.

²⁷ The Australia Institute, *Wasteful consumption in Australia*, 2005, accessible at : https://www.tai.org.au/documents/dp_fulltext/DP77.pdf.

²⁸ Pitt & Sherry, *ACT Greenhouse Gas Emissions: ACT Greenhouse Gas Inventory 2008*, June 2010, p 1.

²⁹ Pitt & Sherry, *ACT Greenhouse Gas Emissions: ACT Greenhouse Gas Inventory 2008*, June 2010, p 4.

Population

- 2.26 The estimated resident population of the ACT was 339,761 persons at 30 June 2007. The ACT population is projected to reach 520,800 persons by 2056. This population growth represents an increase of approximately 53 per cent over the projection period.
- 2.27 Natural increase (births minus deaths) is expected to attribute approximately 73 per cent of this growth while migration accounts for the remaining 27 per cent. The ACT's population is expected to continue to age, with the percentage of the ACT's population aged 65 years and over projected to rise from approximately 10 per cent in 2007 to 20 percent in 2056.³⁰
- 2.28 The following two tables provide a brief snapshot of the ACT population.³¹

Table 1: ACT Demographics

	ACT		Australia	
	1999	2009	1999	2009
Estimated resident population (September quarter)	312,946	353,626	18,984,021	22,065,671
Proportion of Australian population (% , September quarter)	1.6	1.6	100	100
Population growth rate (% per annum to September quarter)	0.9	1.9	1.2	2.1

³⁰ ACT Chief Minister's Department, *ACT population projections 2007 to 2056*, May 2009, accessible at: http://www.cmd.act.gov.au/_data/assets/pdf_file/0010/119719/act-population-projections-2007-2056.pdf.

³¹ ACT Government, *Canberra Quick Stats: 2009-2010*, accessible at: http://www.cmd.act.gov.au/_data/assets/pdf_file/0020/130088/canberra-quickstats-2009-10.pdf.

Table 2: Projected Australian Capital Region Population

Projected Australian Capital Region Population	Population		Growth		
	2006	2026	Number	% 2006-2026	Average % per annum
ACT	334,225	481,900	84,675	25%	1.1%
Australian Capital Region	233,561	289,464	55,903	24%	1.1

2.29 The population density of Canberra is 440 people per km² which, relative to other Australian cities is low, and relative to other world cities, is extremely low.³²

2.30 Population figures alone do not present the entire story for the ACT community. The changing demographics of the ACT's population is also an important factor, for example, the ageing population and skill shortages in some industries.

Infrastructure

2.31 Australian cities are being confronted by significant challenges including population growth and demographic change, transport congestion, living affordability, infrastructure development, productivity growth, climate change and ecological sustainability.³³

2.32 The *ACT Strategic Regional Plan 2010* notes that building quality infrastructure is making an investment in the capacity of Canberra to meet future growth requirements.³⁴

³² Regional Population Growth, Australia, 2008-09, Australian Bureau of Statistics Catalogue Number 3218.0, 30 March 2010; and Australian Demographic Statistics Catalogue Number 3101.0, September Quarter 2009, cited in, Regional Development Australia ACT, *ACT Strategic Regional Plan 2010*.

³³ Commonwealth of Australia, *Infrastructure Australia: State of Australia Cities 2010*, p 1, accessible at: http://www.infrastructureaustralia.gov.au/files/MCU_SOAC.pdf.

³⁴ Regional Development Australia ACT, *ACT Strategic Regional Plan 2010*.

- 2.33 Quality and well planned infrastructure may also facilitate sustainable development. The way cities are planned, built and function can promote more efficient use of resources, including water, energy and land, minimise the production of waste and encourage more reuse and recycling, reduce greenhouse gas emissions, and support biodiversity in and around urban areas through better management of open and green space.³⁵

³⁵ Commonwealth of Australia, *Infrastructure Australia: State of Australia Cities 2010*, p 3, accessible at: http://www.infrastructureaustralia.gov.au/files/MCU_SOAC.pdf.

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3 DISCUSSION QUESTIONS

- 3.1 The terms of reference for this inquiry invite comments on a range of issues including the availability of resources like water, energy and food, trends in resource use, measures for assessing and reducing the ACT's ecological footprint, and relevant infrastructure issues.
- 3.2 The Committee has outlined a number of discussion questions related to the terms of reference as outlined in the table below. These questions should be viewed as a starting point for discussion.

a) the resources available to the ACT in terms of water, energy, and food sourced from within the Territory and outside it

What resources are produced in the ACT?

What resources are produced in the region and used by ACT residents?

From what other areas/regions are resources sourced from?

Is there scope for more resources to be produced locally?

b) effective measures for assessing ecological footprint and carrying capacity

How is ecological footprint and carrying capacity currently assessed?

Are these measures comprehensive and appropriate?

Can you suggest additional measures that may be implemented to assess ecological footprint and carrying capacity?

What other factors should be taken into consideration?

c) current levels of resource use by ACT residents, including:

i) **the current size of the ACT urban, ecological and carbon footprint and how this compares to national averages and similar sized cities globally; and**

ii) **trends in resource use in the ACT and the sustainability or otherwise of these trends continuing**

How is resource use in the ACT currently being measured?

Are these measurements comprehensive and accurate? What other sorts of measures may be useful?

What are the ongoing resource needs and priorities for the ACT and region?

What factors may influence these resource needs into the future?

Can you suggest ways to manage resources more efficiently?

d) a sustainable level of resource use, in terms of ACT urban, ecological and carbon footprints, for the ACT

What factors should be taken into consideration when determining a sustainable level of resource use in the ACT?

e) appropriate ecological carrying capacities based on current, higher and lower consumption models

What is the relationship between consumption and ecological footprint?

What methods may be used to assess ecological carrying capacity?

What factors may affect the assessment of carrying capacity?

How can determining conservation levels assist in assessing carrying capacity?

What is the impact of the use of particular resources for assessing carrying capacity?

Can carrying capacity be influenced by increasing/decreasing use of particular resources?

How might interventions change consumption levels?

f) effective measures for reducing the ACT's ecological footprint

What measures may be effective in reducing the ecological footprint in the ACT?

What barriers may inhibit reducing the ACT's ecological footprint?

Are these barriers unique to the ACT? What has been implemented in other jurisdictions?

g) the environmental, economic and social impacts of reduced resource consumption and a sustainable population

How can individuals alter their patterns of consumption? Should they be required to do so?

Are there any resources that you would be prepared to 'trade-off' in order to reduce consumption?

What does sustainable consumption mean to you?

What sort of initiatives could be implemented to reduce consumption? What are the potential impacts of reduced consumption?

h) the role of the ACT in the region in relation to population and resource use

What is the impact of regional growth on the ACT? For example, service delivery, housing, environmental impact etc.

Can ACT government policies influence population levels?

i) relevant infrastructure issues

What are the current and future infrastructure needs of the ACT?

What factors may influence the ACT's infrastructure needs?

What are the technological advances that may influence infrastructure planning?

What impact will an increasing focus on sustainability have for infrastructure planning?

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WATER

4 INVITATION FOR SUBMISSIONS

- 4.1 The Committee invites comments in relation to the issues raised in this discussion paper from interested individuals and organisations. Submissions do not need to cover all of the issues raised but should respond to at least one of the terms of reference.
- 4.2 The information provided in this paper should not be regarded as exhaustive. Interested parties are invited to bring other information or relevant case studies to the Committee's attention, and to canvass other issues relating to the terms of reference not outlined in this discussion paper.
- 4.3 Further information about making a submission can be found in *Making a submission or appearing before a Committee of the Legislative Assembly for the ACT* available on the Legislative Assembly website at the following location:
<http://www.parliament.act.gov.au/downloads/CommSLwitnessguide.pdf>.

Meredith Hunter MLA

Chair

6 October 2010

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WATER

5 REFERENCES

- 5.1 ACT Chief Minister's Department, *ACT population projections 2007 to 2056*, May 2009, accessible at:
http://www.cmd.act.gov.au/_data/assets/pdf_file/0010/119719/act-population-projections-2007-2056.pdf.
- 5.2 ACT Government, *Canberra Quick Stats: 2009-2010*, accessible at:
http://www.cmd.act.gov.au/_data/assets/pdf_file/0020/130088/canberra-quickstats-2009-10.pdf.
- 5.3 Australian Conservation Foundation, *Consuming Australia: Main findings*, 2007, accessible at:
http://www.acfonline.org.au/uploads/res/res_atlas_main_findings.pdf.
- 5.4 Commonwealth of Australia, *Infrastructure Australia: State of Australia Cities 2010*, accessible at:
http://www.infrastructureaustralia.gov.au/files/MCU_SOAC.pdf.
- 5.5 Environment and Natural Resources Committee, Parliament of Victoria, *Inquiry into sustainable communities*, 2005.
- 5.6 Global Footprint Network and the University of Sydney, *The ecological footprint of Victoria, assessing Victoria's demand on nature*, October 2005.
- 5.7 Office of the Commissioner for Sustainability and the Environment, *Annual report 2008-09*, September 2009.
- 5.8 Office of the Commissioner for Sustainability and the Environment, *ACT State of the Environment Report 2007/08*, accessible at:
<http://www.envcomm.act.gov.au/publications/soe/2007actreport>.
- 5.9 Office of the Commissioner for Sustainability and the Environment, *2008 State of the Environment Report for the Australian Capital Region*, accessible at:
<http://www.envcomm.act.gov.au/publications/rsoe>.
- 5.10 United Nations, *Our common future: Report of the World Commission on environment and development*, accessible at: <http://www.un-documents.net/ocf-02.htm>.

- 5.11 Regional Development Australia ACT, *ACT Strategic Regional Plan 2010*.
- 5.12 Pitt & Sherry, *ACT Greenhouse Gas Emissions: ACT Greenhouse Gas Inventory 2008*, June 2010, accessible at:
[http://www.environment.act.gov.au/data/assets/pdf_file/0015/200175/ACT Greenhouse Gas Inventory 2008.pdf](http://www.environment.act.gov.au/data/assets/pdf_file/0015/200175/ACT_Greenhouse_Gas_Inventory_2008.pdf).
- 5.13 Schooneveldt, J, *Regional Sustainability*, accessible at:
http://www.envcomm.act.gov.au/soe/rsoe2009/overview_schooneveldt.shtml.
- 5.14 Simpson, R, Petroeshevsky, A & Lowe, I, 'An ecological footprint analysis for Australia', *Australian Journal of Environmental Management*, vol.7, March 2000.
- 5.15 The Australia Institute, *Wasteful consumption in Australia*, 2005, accessible at:
https://www.tai.org.au/documents/dp_fulltext/DP77.pdf.
- 5.16 Wanner, T, 'Leaving green footprints: South Australia's strategic plan and ecological footprint', *South Australian Geographical Journal*, vol. 107, 2008, pp 86-102.

APPENDIX A: NSW local government areas

List of NSW councils in the Australia Capital Region

Bega Valley Shire - <http://www.begavalley.nsw.gov.au>

Bombala Council - <http://www.bombala.nsw.gov.au>

Boorowa Council - <http://www.boorowa.nsw.gov.au>

Cooma-Monaro Shire Council - <http://www.cooma.nsw.gov.au>

Cootamundra Shire Council - <http://www.cootamundra.nsw.gov.au>

Eurobodalla Shire Council - <http://www.esc.nsw.gov.au>

Goulburn Mulwaree Council - <http://www.goulburn.nsw.gov.au/>

Gundagai Shire Council - <http://gundagai.local-e.nsw.gov.au/>

Harden Shire Council - <http://www.harden.nsw.gov.au>

Queanbeyan City Council - <http://www.qcc.nsw.gov.au>

Palerang Council- <http://www.palerang.nsw.gov.au>

Snowy River Shire Council - <http://www.snowyriver.nsw.gov.au>

Tumbarumba Shire Council - <http://www.tumbashire.nsw.gov.au>

Tumut Shire Council- <http://www.tumut.nsw.gov.au/>

Upper Lachlan Shire Council - <http://upperlachlan.local-e.nsw.gov.au/>

Yass Valley Council - <http://www.yass.nsw.gov.au/>

Young Shire Council - <http://www.young.nsw.gov.au>