

Foreward

The impacts of a changing climate on both the Goulburn Broken Catchment's natural assets and its community present significant threats and opportunities. The Goulburn Broken Catchment Management Authority (CMA) is committed to being proactive in identifying adaptation responses to mitigate any threats, and at the same time work to identify opportunities for the Authority and the Catchment.

The recently released "State of the Climate 2012" report produced by the CSIRO and the Australian Bureau of Meteorology provides a summary of long-term climate trends. It notes that "the long-term warming trend has not changed, with each decade having been warmer than the previous decade since 1950. The warming trends observed around Australia are consistent with global-scale warming that has been measured during recent decades, despite 2010 and 2011 being the coolest years recorded in Australia since 2001." The document also identifies that "Australian average temperatures are projected to rise by 1.0 to 5.0°C when compared with the climate of recent decades." It also identifies an increase in the number of droughts expected in southern Australia, but at the same time there is likely to be an increase in intensive rainfall events in many areas.

In response to these climatic challenges, the Goulburn Broken CMA has created a clear strategic position defined as; "In dealing with climate change and likely impacts, the Goulburn Broken CMA will focus on adaptation strategies to increase catchment resilience; greenhouse gas sequestration activity such as carbon brokering will be engaged for the purpose of assisting adaptation responses; and mitigation initiatives led by local government will be actively supported."

The Climate Change Integration Strategy outlines how the Authority will achieve this position. It documents the tangible, realistic actions that the CMA can implement in thinking globally but acting locally. It is a flexible document with an associated annual Action Plan to deal with the fast changing nature of climate change policy and knowledge.

This Climate Change Integration Strategy is linked to all areas of the Authority, from the Regional Catchment Strategy to Program Strategies (such as the Biodiversity Strategy and the Reducing Our Footprint Strategy), and as a result will be the responsibility of all staff members to help achieve its outcomes. We look forward to the strategic directions being imbedded in the organisation and across the Catchment.



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Chief Executive Officer

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1. Purpose of the Climate Change Integration Strategy

The Climate Change Integration Strategy (The Strategy) will consolidate a framework for implementing the Goulburn Broken CMA climate change policy statement: "In dealing with climate change and likely impacts, the Goulburn Broken CMA will focus on adaptation strategies to increase catchment resilience; greenhouse gas sequestration activity such as carbon brokering will be engaged for the purpose of assisting adaptation responses; and mitigation initiatives led by local government will be actively supported." As outlined in Figure 1.



Figure 1: Key outcomes of Goulburn Broken CMA Climate Change Policy Statement

The Strategy will support efforts to achieve this policy statement by facilitating the integration of climate change into existing programs of the Goulburn Broken CMA through consideration of climate change adaptation in planning, implementation, evaluation and reporting. The Strategy will investigate initiatives to promote opportunities in the areas of sequestration and mitigation, and provide the vehicle for communicating the Goulburn Broken CMA's position on climate change.

2. Whose Strategy?

This strategy has been developed primarily for the Goulburn Broken CMA Board and Authority staff. It is primarily an internal strategy to guide the Authority's work and priorities.

3. Climate Change in the Goulburn Broken Catchment

The Goulburn Broken Catchment Management Authority Climate Change Position Paper (Feehan, 2007) provides a detailed background on climate change in the Goulburn Broken catchment and the implications for the region's natural assets. The future climate of the Goulburn Broken catchment is expected to be hotter and drier than it is today. By 2030, average annual tempratures will be around 0.8 degrees warmer but the greatest increase is expected to be in spring and summer. The number of hot days is also likely to increase. Reductions in the total average annual rainfall of around 3% are expected, with the greatest reductions in spring.

Although average changes in temperature, rainfall and evaporatation will have long term consequences for the region, the immediate impacts of climate change are more likely to be felt through extreme events such as an increased number of hot days, reduction in the number of frosts and changes in daily rainfall pattens. The risk of bushfires and floods is also likely to increase. (Department of Sustainability and Environment, 2008).

4. Impacts of Climate Change on Goulburn Broken Catchment Asset Classes

Summary of Climate Change Impacts on the Goulburn Broken Catchment from the Garnaut review, 2008: "The Goulburn – Broken Catchment (GBC) forms part of the Murray Darling Basin, covering 2.4 million hectares of Victoria. The GBC has many land-uses, from horticulture to cropping to irrigated dairy pasture. The landscape has been much influenced by human's impacts on vegetation cover, hydrology, nutrient cycling and invasive species..... With greater drying, the thousands of existing farm-dams will intercept an increased proportion of run-off, further reducing yields to stream. Pressure on waterways will reduce opportunities for environmental flows for rivers... Flood plain plant communities, which evolved under and rely on regular flooding, will become even more degraded, further reducing the health of the iconic river red gum forests over the GBC. Many of the rare or threatened species occur in montane and sub-alpine ecosystems. Increasing temperature will place pressure on threatened species in montane and sub-alpine ecosystems, forcing a retreat to high altitudes or extinction" (Mac Nelly et al. 2008).

4.1 Terrestrial Biodiversity (including threatened species)

Climate change will affect the richness of biodiversity and the health of landscapes. Habitats for critical species may be limited and changing weed distributions could place new pressures on ecosystems. Climate change affects individual species in different ways. It may alter their distribution, abundance, behaviour, phenology, morphology and genetic composition. The most susceptible species will be those with restricted ranges, specialised habitat requirements, poor ability to move around or small populations. Climate change will also have important indirect impacts on species. There may be increased pressure from competitors, predators, parasites, diseases and disturbances such as bushfire or drought (DSE, 2008). The "Biodiversity Strategy for the Goulburn Broken Catchment, Victoria" developed in 2010 states that "Climate Change is seen as a critical element for consideration in biodiversity conservation and requires special attention in this Strategy" (GBCMA, 2010).

4.2 Soil and Land

Under the current climate change projection "increased risk of soil erosion and nutrient loss due to reduced vegetation cover in combination with episodic rainfall and greater wind intensities is expected. Fires will reduce ground cover and soil stability, particularly in the sub-alpine regions, and increase risk of soil and nutrient export into waterways. Climate change will shift the equilibrium of numerous soil processes including carbon and nitrogen cycling, acidification, risk of erosion and salinization (Nuttall et al. 2008).

Significant land use change in the Goulburn Broken Catchment may also result from Climate Change impacts and associated policy. This presents a number of opportunties for the Goulburn Broken Catchment but also potential challenges, e.g. ensuring that the the productive capacity of the catchment is maintained and enhanced. Maintaining the productive base of the catchment will need to be a key consideration in implementing climate change initiatives and actions.

4.3 Rivers and Wetlands

A changing climate may have a range of impacts on water quality, river health and wetlands. Climate change is likely to increase the stress on rivers already under pressure. Higher water temperatures and reduced stream flows will tend to adversely affect water quality, affecting habitat values for aquatic and riparian species and affecting human uses. Drought conditions are likely to exacerbate erosion and downstream sedimentation. Higher sediment loads enter rivers following extreme rainfall events or extreme bushfire events, both of which are projected to increase with climate change. Changed climatic conditions are also likely to produce conditions that favour riparian and aquatic weeds and algal blooms.

Strategies for achieving river and wetland health recognise climate change as a significant threat and are developing initiatives to mitigate these.

4.4 Communities

Viable communities are a valuable component of our catchment, without them we lack the land and water resources, along with the support to undertake our on-ground works. Climate change impacts these communities in many ways notably via changing priorities, this is both locally around the rate of update and location of on-ground activity, and more broadly aroundwillingness to invest. Another major driver of impact on communities is presence/absence of opinion, is climate change real or is it just a long term cycle? This opinion impacts on communities in the form of splitting groups who were previously heading in a single direction thus creating community disharmony. There is a body of thought that it is this splitting that has been the driver for the evolution of Climate Action groups, evolving from traditional NRM groups such as Landcare, friends of and production groups (Kubeil pers comm 2011).

5. Links to External and Internal Strategy

5.1 External

A review of external strategies, policies, research and investigations at the federal, state and regional level found that climate change activities fall into three broad areas of focus; (i) pricing carbon (ii) carbon accounting, and (iii) resilience.

It should be noted that the Victorian Coalition Government, elected in 2010, is in the process of finalising its strategy and policy on these issues.

Price on Carbon

An initiative for pricing carbon has been introduced by the Federal Government. This will be implemented in the near future after being passed by government. Funds raised from this initiative will provide \$1.7 billion into the Clean Energy Future Land Sector Fund for a range of activities. The Goulburn Broken CMA is actively seeking opportunities presented by this funding for the purpose of achieving the Goulburn Broken CMA vision. The Carbon Farming Initiative (CFI) is also being rolled out under the Federal Government Clean Energy Future Initiative.

Carbon Accounting

Carbon accounting systems and methodology are being developed at the federal level which is likely to influence investment in carbon storage. The Goulburn Broken CMA has a role in reviewing the integrity of the methodology and promoting key messages such as the role of natural regeneration of native vegetation in accounting systems and the promotion of standards for biodiversity plantings. A Monash University project – The Carbon Project – will inform the Goulburn Broken CMA of potential effects that land use practices, including carbon plantings, will have on catchment processes and provide regional data to make better-informed decisions. (Monash University, 2011)

Resilience

There is an extensive list of strategies, policies and investigations in the resilience field developed at the federal, state and regional levels. Resilience is a measure of a system's capacity to cope with a change while retaining essentially the same structure and function. There is some emphasis by proposed Victorian Government initiatives on protecting assets of highest community value and the Goulburn Broken CMA will need to play a role in advocating for the consideration of ecological values for the well-being of their community and ecosystems. There will be a 'business as usual' approach to ensure that state-wide programs consider challenges and opportunities at the regional level and to provide the best available regional information to policy makers and implementation coordinators. There could potentially be a significant increase in investment in community resilience programs and the Goulburn Broken CMA will take the opportunity to continue supporting local government and community networks to aim for a coordinated approach to ensure maximum benefit from this investment for the region. Some of the resilience work will provide information on best-practice climate change adaptation activities occurring across Australia that the Goulburn Broken CMA can learn from and implement into its own programs. The Goulburn Broken CMA will also be using the resilience approach to develop the new 2012-2018 Regional Catchment Strategy (RCS).

Funds through the Australian Government's Caring for Our Country and the Clean Energy Future Land Sector Fund e.g. the Biodiversity Fund will provide resources to implement some of the resilience principles on-ground. There will be continued focus on resource-use efficiency and as an organisation that values achievement, excellence and accountability, the Goulburn Broken CMA will strive to lead by example in reducing its organisational resource and carbon footprint, and implementing a best-practice approach.

5.2 Internal

The Goulburn Broken CMA has a range of strategies which inform the organisation's direction. The structure follows.

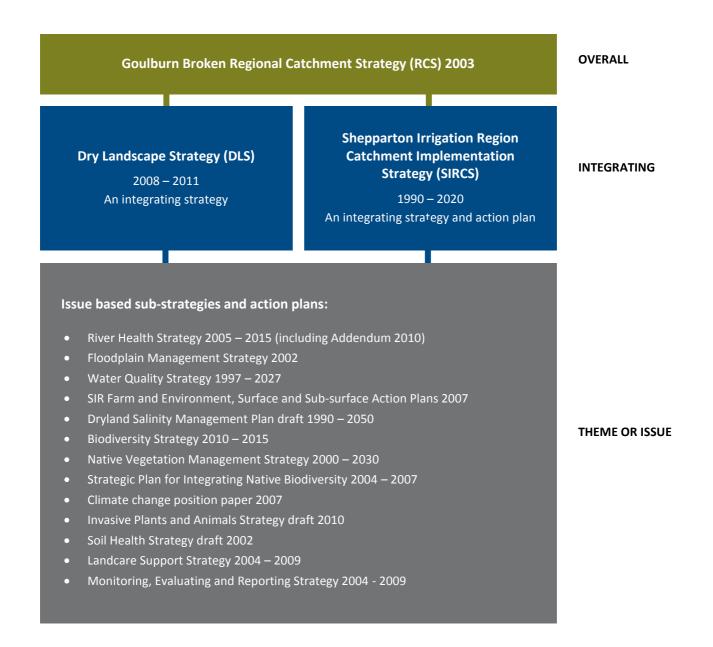


Figure 2: Structure of Goulburn Broken CMA strategies.

The Regional Catchment Strategy (RCS) provides the overall direction for the Goulburn Broken CMA and ensures that statutory obligations are met. A new RCS is under development and it is expected to be released in late 2012. Climate change was considered in the current RCS (Goulburn Broken CMA 2003b), but to a limited extent which mirrors the understanding of climate change and its implications for natural resource management at the time. It is anticipated that climate change will be discussed further in the new RCS and the threats that it poses to the resilience of the catchment will be considered in targets and actions identified in the document.

It should be noted that a range of actions and investment plans underpin the RCS and sub-strategies.

Theme or issue based sub-strategies provide a framework for how targets and actions of the RCS will be achieved. There are a range of drivers for the development of sub-strategies, therefore the guidelines and format of the sub-strategies vary greatly. Some of the strategies have been driven almost completely at a regional level, for example the Biodiversity Strategy for the Goulburn Broken Catchment 2010-2015, and some have been guided by the needs of government, for example the Invasive Plants and Animals Strategy 2010.

A review of the sub-strategies generally highlights that there has been an ad hoc approach to how Climate Change has been considered in planning. This is a result of the age of the strategies, frequency of review, and guidelines provided.

The Biodiversity Strategy for the Goulburn Broken Catchment 2010-2015 undertook a climate change and biodiversity risk assessment, which provided information that was then incorporated into the substrategy itself (e.g. through the actions). The Water Quality Strategy (1997 - 2027) also undertook a climate change risk assessment. Climate change risks and threats have not been as clearly integrated into the development of other sub-strategies.

It is anticipated that the Climate Change Integration Strategy will provide a more standardised approach to climate change integration into programs using a range of mechanisms including strategy development, review and identification of relevant funding opportunities.

6. What are we aiming for?

The outcomes and goals for the Climate Change Integration Strategy are summarised in Table 1 below. Some of the goals are very clear and specific, however this is not possible for all outcomes as there are numerous unknowns that are associated with climate change which in turn create some limitations. This is the first Climate Change Integration Strategy for the organisation and a focus on continuous improvement will be imperative.

Outcomes	Goals	
Integrate climate change into GB CMA programs	 100% of all sub-strategies include climate change analysis and actions as they are renewed or developed. 80% of biophysical projects include contributions to the Climate Change Integration Strategy's purpose in funding bids and reporting by 2015. 	
Improve understanding of climate change	 Ensure adequate climate change information is available to add value to planning and investment decisions. Help grow the capacity of our partners in understanding and respond to Climate Change Improve the Goulburn Broken CMA's knowledge of potential impacts of climate change by initiating or partnering one climate change research project each year. Develop a quantitative measure that determines the contribution to the Strategy's purpose by 2015. 	
Pool and attract resources	 Source at least \$2 million of new funds through climate change avenues for Goulburn Broken CMA and partners by 2015. Increase the ability of organisations across the catchment to attract climate change funding, by partnering 6 climate change related projects led by other organisations by 2015. 	
Build catchment resilience into sequestration activities	 Ensure 100% of carbon sequestration activities undertaken by the GB CMA take into account and align with standards to promote resilience of the catchment by 2015. Encourage other government agencies and industry to take into account and align with standards to promote resilience of the catchment. 	
Support community mitigation efforts	Partner 4 community climate change projects / organisations by 2015.	
Minimise GB CMA footprint	 Implement the 2012 - 2014 Reducing our Footprint targets and actions. (Appendix 1) Update and further develop the Reducing our Footprint Action Plan for 2015-2018 by January 2015. 	

Table 1: Goulburn Broken CMA Climate Change Integration Strategy Outcomes and Goals

7. Strategic Framework

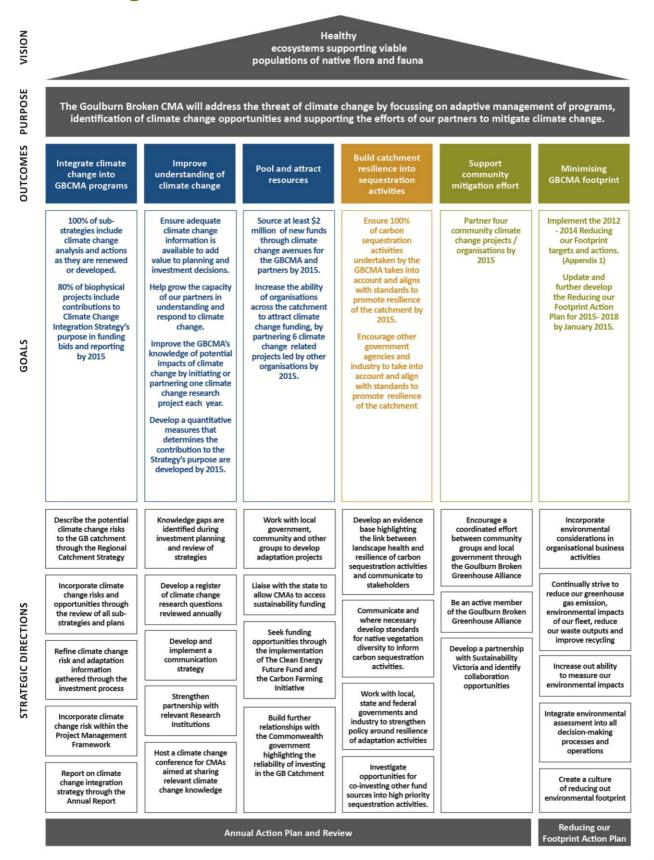


Figure 3: Climate Change Integration Strategy Strategic Framework

8. How we will get there?

8.1 Integrate Climate Change into Goulburn Broken CMA Programs

This outcome is a key component of achieving the Goulburn Broken CMA's climate change policy position. Several activities have been undertaken in the past to achieve this outcome including (i) workshop in 2008 using the Drivers, Pressures, State, Impacts and Response (DPSIR) conceptual model to highlight adaptation strategies, (ii) risk assessment for water quality and biodiversity, (iii) developing questions about climate change as part of the annual Expression of Interest process for funding, and (iv) introducing climate change reporting for all programs as part of the Annual Report.

This outcome and associated goals and strategic directions build on work already undertaken.

Outcome • Integrate climate change into Goulburn Broken CMA programs	
Goals	 100% of all sub-strategies include climate change analysis and actions as they are renewed. 80% of biophysical projects include contributions to the Climate Change Integration Strategy's purpose in funding bids and reporting by 2015.
Strategic Directions	 Describe the potential climate change risk to the Goulburn Broken Catchment through the Regional Catchment Strategy. Incorporate climate change risks and opportunities through the review of all sub-strategies and plans. Refine climate change risk and adaptation information gathered through the investment process. Incorporate climate change risk within the GBCMA's Project Management Framework. Report on Climate Change Integration Strategy through the Annual Report.

8.2 Improve understanding of climate change

The Goulburn Broken CMA strives to incorporate the most up to date information into organisational planning, implementation, monitoring, evaluating and reporting. Climate change poses a significant challenge and there are many unknowns. Keeping abreast of all developments in research, investigations and policy is a challenge for an organisation the size of the Goulburn Broken CMA. This highlights the need for the organisation to be clear on its role in climate change mitigation and adaptation and for its partners to understand this role.

Outcome	Improve understanding of climate change
Goals	 Ensure adequate climate change information is available to add value to planning and investment decisions. Help grow the capacity of our partners in understanding and respond to Climate Change Improve the Goulburn Broken CMAs knowledge of potential impacts of climate change by initiating or partnering one climate change research project each year. Develop a quantitative measure that determine contribution to the Strategies purpose are developed by 2015.
 Strategic Directions Knowledge gaps are identified during investment planning and review of sub-strategy. Develop a register of climate change research questions and review annually. Develop and implement a Climate Change Communication Strategy. Strengthen partnerships with relevant Research Institutions. Host a climate change conference for CMAs aimed at sharing relevant climate changelege. 	

8.3 Pool and attract resources

Whilst climate change poses a number of challenges for the Goulburn Broken CMA, there is the potential for the organisation to source additional funds to further opportunities to achieve the Strategy's purpose. There are a number of unknowns and the opportunities are not clear as yet, however the Goulburn Broken CMA, through this strategy, is committed to preparing for potential opportunities and will actively seek partnerships. The Australian Government's Clean Energy Future Land Sector package offers a range of opportunities for the Goulburn Broken CMA and will be monitored closely as it is implemented.

Regional Natural Resource Management (NRM) Groups' commercial involvement in the emerging carbon market will be explored by the National Natural Resource Management Carbon Working Group, which the Goulburn Broken CMA supports and sponsors. This is in line with the direction previously set by the Goulburn Broken CMA Board as a key business principle "The Goulburn Broken CMA will play an active role in Climate Change policy discussions, and will ensure that the Authority is well positioned to respond to emerging opportunities and challenges with respect to climate change and climate change policy implemented where aligned to the Authority's vision and purpose" (Corporate Planning Workshop, March 2011). There is a range of issues to consider and there is a range of ways in which NRM Groups could be involved, including aggregation and auditing of carbon credits, delivery of onground works, co-investment and promotion.

Outcome	Pool and attract resources
Goals	 Source at least \$2 million for new projects through climate change avenues for the Goulburn Broken CMA and its partners by 2015. Increase the ability of organisations across the catchment to attract climate change funding, by partnering 6 projects led by other organisations by 2015.
Strategic Directions	 Work with local government, community and other groups to develop adaptation projects. Liaise with State government to allow CMAs to access sustainability funding. Seek funding opportunities through the implementation of the Clean Energy Future funds. Build further relationships with the Commonwealth government, highlighting the reliability of investing in the Goulburn Broken Catchment.

8.4 Build catchment resilience into sequestration activities

The emerging carbon market and developments in carbon policy and programs, particularly at the federal level present opportunities to achieve the Goulburn Broken CMA vision. The Goulburn Broken CMA is looking for opportunities to encourage bio-sequestration projects that have multiple outcomes for the catchment (including biodiversity conservation, improved water yield and improved river health). As this is an emerging market, the Goulburn Broken CMA will endeavour to influence policy and to build on this new mechanism for on-ground works into organisational planning and implementation.

The Goulburn Broken CMA has been active in providing feedback to carbon policy developments, such as the Federal Carbon Farming Initiative (CFI), to ensure good natural resource outcomes are achieved through programs.

Currently the carbon market is a fast moving scheme and a number of key components are not yet finalised. This strategy aims to provide some strategic direction to get the most out of all the market's possibilities.

Outcome	Build catchment resilience into sequestration activities
Goals	 Ensure 100% of carbon sequestration activities undertaken by the GB CMA take into account and align with standards to promote resilience of the catchment by 2015. Encourage other government agencies and industry to take into account and align with standards to promote resilience of the catchment.
Strategic Directions	 Develop an evidence base highlighting the link between landscape health and resilience of carbon sequestration activities and communicate to stakeholders Communicate and where necessary develop standards for native vegetation diversity to inform carbon sequestration activities Work with local, state and federal governments and industry to strengthen policy around resilience of adaptation activities. Investigate opportunities for co-investing other fund sources into high priority sequestration activities.

8.5 Support community mitigation efforts

The Goulburn Broken CMA is committed to supporting communities, primarily through local government, to encourage broader mitigation efforts. The Goulburn Broken CMA recognises the importance of mitigation efforts, however is not best positioned to lead mitigation initiatives as the funding opportunities and other resources are limited (beyond the organisation itself).

The Goulburn Broken CMA is a founding member of the Goulburn Broken Greenhouse Alliance and views this as an appropriate mechanism for leading large-scale mitigation projects. The Goulburn Broken CMA also supports *The Hume Strategy for Sustainable Communities, 2010-2020,* and its mitigation / community initiatives. The Climate Change Integration Strategy highlights the Goulburn Broken CMA's goals for engaging with the broader community with regards to climate change mitigation and outlines strategic directions for achieving these goals.

Outcome	Support community climate change mitigation effort
Goals	Partner 4 community climate change projects / organisations by 2015
Strategic Directions	 Encourage a coordinated effort between community groups through the Goulburn Broken Greenhouse Alliance. Be an active member of the Goulburn Broken Greenhouse Alliance, including providing ongoing sponsorship. Develop a partnership with Sustainability Victoria and identify collaboration opportunities.

8.6 Minimise Goulburn Broken CMA footprint

The Goulburn Broken CMA acknowledges the importance of protecting environmental values and setting an example for the community and other organisations.

The Goulburn Broken CMA formalised its approach to minimising the environmental footprint of its business activities in 2007-08 through the Reducing Our Footprint project supported by the Victorian Government's ResourceSmart program.

The Goulburn Broken CMA's Organisational Environmental Footprint Policy and Organisational Environmental Footprint Strategy & Action Plan were revised in 2011 and supporting procedures are being developed to minimise the Authority's environmental footprint for a range of business activities. The internal implementation program of the Action Plan is promoted as Reducing our Footprint (RoF) and is supported and governed by the RoF Working Group.

The two most significant environmental impacts of the delivery of our core business relate to energy use and our vehicle fleet. Almost two thirds of our total annual GHG emissions are from our vehicle fleet.

Outcome • Minimise the Goulburn Broken CMA organisational environmental footprint.	
Goals	 Implement the 2012 - 2014 Reducing our Footprint targets and actions. (Appendix 1) Update and further develop Reducing our Footprint Action Plan for 2015-2018 by Jan 2015.
Strategic Directions	 Incorporate environmental considerations into organisational (office & vehicle based) business activities. Continually strive to reduce our greenhouse gas emissions, reduce the environmental impacts of our vehicle fleet, reduce our waste outputs and improve our recycling. Increase our ability to measure our environmental impacts. Integrate environmental assessment into all decision-making processes and operations. Create a culture of reducing our environmental footprint.

9. Evaluation and improvement

Figure 3 outlines the Goulburn Broken CMA's planning cycle and how it will be applied to the Climate Change Integration Strategy. This framework allows for important questions to be asked annually, such as how did we do this year against what we said we would do? It also allows for analysis of long-term strategy implementation (3 years), e.g. how have we gone against what we said we would do (e.g. outcomes and goals) when we wrote the Strategy?



Figure 4: MER Climate Change Integration Strategy process.

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11. Appendix

Environmental objectives and targets

In line with the Authority's Organisational Environmental Footprint Policy and direction provided by Sustainability Victoria, the following environmental objectives and targets have been identified for the 2011-2014 Reducing Our Footprint Action Plan.

Objectives	Targets to meet this objective
Incorporate environmental considerations into organisational (office & vehicle based) business activities.	Develop procedures to support the Organisational Environmental Footprint Policy in the areas of Energy, Waste, Water, Vehicle Fleet and Paper by June 2012.
Continually strive to reduce our greenhouse gas emissions.	Reduce greenhouse gas emissions from our operations by 20% compared with 2006-2007 by 2012.
	Purchase at least 25% of Green Power by June 2012.
	Develop 2013 and 2014 targets for improving environmental performance for fleet, waste, energy and water reduction by June 2012.
Continuously strive to reduce the environmental impacts of our vehicle fleet.	50% of passenger vehicles in the fleet generate less than 200 g CO2-e/km by June 2012.
Continually strive to reduce our waste outputs and improve our recycling.	Reduce waste generation by 10% by 2012, compared to 2010-2011.
	Improve our recycling rate to 70% by June 2012.
Increase our ability to measure our environmental impacts through establishing data collection systems or processes by December 2011.	Implement data collection plan and distribute to relevant staff by December 2011.
Integrate environmental assessment into all decision-making processes and operations.	Integrate environmental considerations into all contracts, tenders and purchasing templates by December 2012.
Create a culture of reducing our environmental footprint.	Re-establish and reinvigorate the Reducing Our Footprint (RoF) Working Group by June 2012.
	Promote RoF activities and initiative to staff.