



**Excellence in sustainable design in
the Molonglo Valley development**

A Discussion Paper by the ACT Greens

February 2010

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1. Introduction

The ACT Greens want to ensure that the greenfield development at Molonglo is genuinely sustainable, with low water and energy use and clever design innovations that will make it an easy and pleasant place for Canberrans to live. A greenfield development, Molonglo should be built with suburbs that perform to climatic and resource constraints well into the future. It should be development that we are all proud of, demonstrating world's best practice at every level of design and construction.

This discussion paper is intended to propose a new way of establishing greenfield developments in the ACT, including the Molonglo Valley. The current proposal for Molonglo is for 30,000 houses, with 55,000 residents.

Given the technology and thinking available to us on sustainability today, we believe that the aspiration for Molonglo should be built as a zero emission neighbourhood.

“Excellence in sustainable design” is the commitment made in the ALP-ACT Greens Parliamentary Agreement. This paper is an attempt to outline what this looks like in terms of implementation across a new development. The ACT Greens are concerned that while the concept plans for both Coombs and Wright express a commitment to incorporating “principles of contemporary best practice”, a vision for excellence in sustainable design has not been clearly articulated.

Consultation

The ACT Greens look forward to receiving feedback from the community on this issue. We will be holding a number of events to discuss our proposal over coming weeks.

The first event will be held on **Tuesday 9 March**, at the ACT Legislative Assembly Reception Room at 5.30 for 6pm – 7.30pm. There will be speakers to address issues raised within the paper.

Feedback

Please send feedback on this proposal **by Friday 9th April**. Submissions can be sent to LECOUTEUR@parliament.act.gov.au. If you would like more information, please contact us on 6205 0051.

2. Energy

Intended policy outcomes

Outcomes at a suburb / precinct level - delivered through being embedded in the concept plan:

- Mandatory solar passivity – solar orientation at suburb level – needs to be embedded at Concept Plan stage, solar orientation at block level, use of thermal mass, orientation to maximise use of ventilation.
- Microclimate management – allowing space to be planned between / around residences to ensure vegetation, which can not only be used for privacy and amenity, but which also serve to insulate buildings and lower outdoor air temperatures.
- Set aside space for community level renewable energy generation installations. (eg. localised wind generation / mid-scale PV installations)
- Integration with energy incentives such as the Feed in Tariff, and other energy initiatives to be developed in the energy policy
- Use of energy efficient infrastructure (such as street lighting) at a suburb-wide level
- Consideration of integrating suburban level infrastructure for the use of direct geothermal heat transfer technology for heating and cooling of houses and public buildings, including shopping centres etc.

Outcomes at building level

- Energy efficiency minimum standard of 7 star rating at the initial stages of development (2011). Should this not be included in the 2011 BCA, the ACT should implement this separately.

Outcomes not delivered through the above mechanisms:

- Energy efficient hot water systems
- Sustainable material selection for construction.
- Energy efficient lighting and appliances
- Outdoor drying areas for all unit title developments
- Mandatory car parking requirements reduced to one per dwelling.

Discussion

Any new green field development should be planned and built so as to minimise carbon emissions. Houses built with sustainable design principles are now starting to approach carbon neutrality, but this can only be achieved with both suburb level planning as well as design features within each property.

There are a number of energy efficiency measures that require implementation at a suburb and precinct level: solar orientation, planning for microclimate management, and ensuring appropriate space for renewable energy generation. Installation of common facilities that are energy efficient is also important (eg. street lighting)

“Excellence in sustainable design” implies an energy efficiency rating level that is at the cutting edge of what is able to be achieved. A seven star EER for new houses built in Molonglo in 2011 would be achievable and would assist that move towards carbon neutrality. The Greens would ideally like to see the incremental increasing of EER for residential housing in Molonglo such that by 2016 all new residential buildings in Molonglo are carbon neutral.

3. Transport

Intended policy outcomes

- To create a community with modern, sustainable public transport where the goal of a one-car household is achievable for residents.
- Public transport options from day one
- Bus-only priority routes on arterial roads to City/Barton/Russell (on frequent/peak express routes)
- Park'n'ride and Bike'n'ride facilities from day one
- Cycle highways connecting Molonglo to City/Barton/Russell
- Incorporation of urban design concepts to encourage active transport to and from public transport stops
- Public transport infrastructure designed to adapt easily to potential future non-bus public transport options

Discussion

To secure an increase in usage of public transport in proportion to other forms of transport, the ACT Government will need to ensure that public transport is available to all new residents. This will mean bus services will be required from the day that the first resident moves in, ensuring that residents who choose to move to Molonglo are not forced to unnecessarily purchase/utilise private vehicles. If there is an absence of public transport infrastructure at the outset of residency, there is a risk that people will develop unsustainable transport habits.

Effective design of infrastructure, particularly when paired with urban design concepts that encourage ‘active transport’ (walking and cycling) to and from public transport hubs can create neighbourhoods where it is both more pleasant and convenient to use public transport. Further to this, identifying public routes prior to construction is an opportunity for the government to invest in infrastructure in the form of bus-only lanes or dedicated bus-only roads. In particular, we recommend that the Government consider the creation of an additional bus-only short-cut road along the routes of frequent and peak-express services to the City and Barton/Russell.

The Greens recommend incorporating ‘cycle highways’ connecting Molonglo to the City and the Parliamentary Triangle to provide a rapid and safe route for cycle-commuters.

Viability of public transport in the Molonglo area will rely upon the planned public transport hub being operational as soon as possible, and ensuring it is accompanied by infrastructure that encourages its use (such as park/bike'n'ride facilities).

Furthermore, as identified in the Strategic Network Plan, usage of public transport will be dependent on minimising wait times, requiring high-frequency buses to and from major employment centres.

Issues for clarification

Cost

Accepting that buses from day one will run at a loss, what will be the cost/revenue outcomes based upon than a higher-than-average uptake of public transport to commute to and from Molonglo?

Regulation

Will there need to be changes to planning regulations to reduce mandatory parking requirements in residential buildings (to allow for low- or no-parking apartment buildings, for example)?

4. Sustainable road and path networks

Intended policy outcomes

- To develop an area in Canberra where the goal of a one-car household is easily achievable for residents
- Embed lower car use targets in Molonglo than in other parts of Canberra into the Sustainable Transport Plan
- Prioritise pedestrian and cycle networks
- Consider 40 or 30 km/h speed limits for all residential areas
- Restrict unlimited provision of car parking spaces in town and group centres, and increase bicycle parking facilities
- Modify the proposal for John Gorton Drive, as outlined below
- Provide cycle highways, rather than meandering “Sunday-ride” type bike paths

The creation of Molonglo should not lead to an overall increase in car traffic in the ACT. The new Sustainable Transport Plan should set targets for an overall reduction in numbers of cars on the road in the ACT. Molonglo should have lower car use targets than other areas in Canberra generally.

All residential areas should incorporate speed reduction measures, give greater priority to the needs of the pedestrian and cyclist and improve the quality and amenity of the local street environment. Consideration should be given to a 40km/h or 30km/h speed limit for all residential areas not just community facilities. This will improve safety and accessibility for pedestrians and cyclists. 30km/h is becoming accepted internationally as the most appropriate speed for residential amenity and the safety of vulnerable road users.

Car based commuter trips and peak hour travel demand should be restrained by restricting the unlimited provision of car parking spaces. Unlimited provision only serves to exacerbate the problems of congestion and pollution. This should be balanced by a high standard of parking for bikes.

John Gorton Drive

The proposed plan for John Gorton Drive appears to be too car-friendly, and set to encourage the use of cars by Molonglo residents well into the future, rather than creating a sustainable neighbourhood which accentuates the use of public transport and cycling and walking as priority modes.

Our proposal for modification of the Road as currently proposed is to:

- maintain the local car access road;
- move the cycle lane into a separate off-road super cycle path;
- maintain the bus transit lane; and
- remove one of the lanes of car traffic from each direction.

Cycle highways

We recommend the Government investigate the 'cycling highway' concept – that is creating stretches of smooth cycling paths where traffic lights are limited, and where cyclists have right of way at any point where they cross traffic. These 'highways' are smooth and well maintained, to a higher degree than regular bike paths. Cycle routes travelling out of the new suburbs being developed in Molonglo are an ideal spot to use cycling highways and need to be integrated into Structure and Concept Plans. We propose that the East-West arterial road leading to the Tuggeranong Parkway be a bus-only access road, and that the cycle highway be co-located with this into the City and Parliamentary Triangle area.

Canberra's current off-road cycle path network winds considerably and crosses many roads, which means cyclists often take indirect routes, as well as stop at road crossings to wait for cars. In contrast, the cycle highways offer safety and directness to cyclists. Motorists can occasionally access these roads at spots where they need to cross, or need access – but are always expected to give way to cyclists.

London's mayor has recently announced that building 'cycle superhighways' is part of his plan to boost low carbon transport and make London one of the world's great cycling cities.

A precedent was set in the Dutch city of Assen, which has a population of around 70,000. When a new suburb was built on the edge of the city, around 5km from the city centre, the local council was concerned that new residents would be put off cycling if there was not an adequate route to the city. The council decided to plan a cycle highway that took the most direct route to the city. It takes in no traffic lights or other obstructions and is shorter than the driving route. The route is easy, safe and pleasant for cyclists and since the building of the new development, the cycling rate in Assen has increased. 41% of all journeys in the city are now by bike.

5. Pedestrian friendly design

Intended policy outcomes

- Prioritise pedestrian and cycle movements rather than car movements (this also helps people using public transport).
- Create neighbourhoods with well-connected street networks and mixed land-use

Good design and people-friendly spaces and places can promote active lifestyles by encouraging walking, cycling, public transport and active recreation. On the other hand, places designed around private motorised transport can limit a person's opportunities and desire to be physically active. Pedestrian friendly design is also cycle friendly design.

Our sedentary, car-dependent lifestyles are significant contributing factors to the prevalence of preventable health issues. Development practices have contributed to these problems by often giving priority to cars (vehicular movement) rather than encouraging people to walk, cycle and use public transport.

Neighbourhoods that have good access to destinations including shops, schools, public transport and other facilities and have connected street networks, mixed land use and higher densities are associated with increased walking and cycling for transport. A walkable distance means a distance that most people could walk in 5-10 minutes, commonly about 400 metres.

Planning for active living needs to be considered by and across all professions involved in the design and approval processes. Seemingly small considerations (e.g. widening footpaths or lowering traffic speeds) can impact as much as the major decisions when it comes to planning that can improve people's health and wellbeing.

Methods for prioritising pedestrians and cyclists in the design and redesign of local neighbourhoods, especially around shopping centres, workplaces and schools, include:

- improving proximity and accessibility to shops, services, public transport and public open space by increasing residential densities around these destinations and providing connected street networks and footpaths
- designing and redesigning public open space to create attractive open space with good surveillance, safe pedestrian access, walking paths and trees, catering for the needs of multiple users
- reducing exposure to traffic for pedestrians and cyclists
- reallocating road-space to cyclists and pedestrians
- introducing traffic calming measures and lowering speed limits
- creating attractive, well-lit streetscapes with shade trees
- ensuring footpaths are an adequate width, with an even surface, minimal obstacles and curb cuts/pram ramps to provide a supportive walking

environment for multiple users; consideration could be given to footpaths being on both sides of the street.

- creating safe routes to major destinations and schools including safe road crossings and walking and cycling paths
- designing shopping centres and workplaces with active frontages that promote the natural surveillance of adjacent streets and car parks, and ensuring these areas are well lit at night.

Increasing areas of mixed land use is vital to creating a sustainable community. This means ensuring complementary uses in areas are co-located to promote active transport to and between different activities, such as houses, shops, schools, offices, libraries, open space and cafes. People are more likely to walk, cycle or take public transport when they can conveniently undertake multiple activities at one destination. This may require changes in the residential codes for Molonglo, and possibly the rest of the ACT, to allow this.

Perceptions of safety influence the nature and extent that people use spaces and places. Design that aims to increase safety and surveillance to reduce crime can enhance the physical, mental and social wellbeing of a community. One area for special attention is the bus interchange, as perceptions of safety influence bus use, especially after dark. 'Peopled' places are safe places - the very fact that there are many pedestrians and cyclists in an area, and a low amount of cars, greatly increases the likelihood that other people will walk, cycle and get out in the community.

Adequate provision of supporting infrastructure is also key - provide facilities that encourage regular and safe physical activity, such as walking (footpaths, lighting, water fountains and signs), cycling (bike paths, bike lockers, signs and showers), public transport (safe shelter, lighting and signs), social interaction (seating, shade, shelter and toilets) and recreation (seating, play equipment and facilities).

Improve current bike parking guidelines such bike parking is plentiful, convenient, with appropriate access, and given priority of car parking.

6. Child friendly-design

Intended policy outcomes

- Involve children in the planning and design processes
- Provide spaces and facilities for the use of children, young people, disabled and the aged
- Create neighbourhoods which are child-friendly

Ensuring that children are consulted and involved in urban design planning is fundamental to being a child friendly city. As the ACT Government is already pursuing a process for making Canberra a Child-Friendly City, there may be an existing plan to progress this commitment across all agencies. Cross-agency coordination across a

number of departments and the wider community will be required to fully and successfully implement these agreement items.

Being child-friendly generally incorporates: being a sustainable city; creating processes which involve children in planning and decision-making; and of course ensuring that designs and developments are clean, safe, relaxing and nourishing. This means creating places to live which provide the right facilities for living, travelling, exploring and being creative; support families and family activities; and help give a sense of connection with the community and the neighbourhood. In summary, it means providing both safe and stimulating social and physical places, and putting children first.

A Child Friendly City is actively engaged in ensuring that every young citizen can:

- walk safely in the streets on their own
- meet friends and play
- have green spaces for plants and animals

Children are the best experts on local environmental conditions as they relate to their own lives. Some studies of community life have shown children to be the heaviest users of outdoor space as they often venture into areas that adults rarely use. Therefore, planning can benefit from children's local knowledge. Several experiments on children's participation in urban planning in Finland, Norway, Switzerland and Italy have demonstrated that young people are sharp analysts of their settings and creative producers of ideas for their local areas. Unfortunately planning authorities are usually reluctant to expand their top-down, expert-based mode of urban planning to include new groups, such as young people.

Some key urban design components of Child-friendly cities include:

- walking links to play areas and services. Ensuring that the suburb is designed so that children can walk to school and to other activities (e.g. Watson's street design is planned so that children can walk to the end of their cul-de-sac and then walk along the open green space without having to cross lots of roads.)
- youth friendly recreation areas
- facilities such as shade, shelter, seating, toilets, drinking fountains, children's' playgrounds, picnic areas, facilities and equipment and activity spaces for youth such as basketball hoops
- adaptable and flexible buildings so use can change to meet changing community needs and expectations
- ensuring that traffic movements are slow and safe.
- building in passive surveillance
- making streetscapes interesting and welcoming (and shady)

There are a number of simple guides on various website which outline clearly essential steps in becoming a child-friendly city, and some focus specifically on medium to high density housing. DHCS has already done much of this work in preparing its Children and Young People Plan.

7. Water

Intended policy outcomes

- The provision of non-potable water to all households in Molonglo as well as to recreational areas through management of grey water and /or storm water.
- A minimum 4 star water rating for water fittings and appliances when fitted as part of development.
- Inclusion of smart meters to measure water consumption / patterns.

Discussion

The Greens support many of the proposed measures that could be achieved through the use of Water Sensitive Urban Design being integrated into the planning process at the structure and concept plan stage, including water quality control ponds, landscaping, wetlands and natural waterways.

Our initial articulation of the provision of non-potable to householders in the period prior to the 2008 Election was that non-potable water would be pumped back up from the Molonglo Water Quality Treatment Works and reticulated to each household. This was outlined in a Greens media releases during the election campaign.

The premise of including a third pipeline early in the development of the new suburbs is to avoid the costs of expensive retro-fitting after suburbs have already been built. Best practice for the development of a modern urban water management system includes integration of these principles at the outset of planning for new suburbs.

We are aware that the Government has already included in its plans for Molonglo the development of urban storm water ponds throughout Molonglo to be used as a non-potable water resource for recreational areas, and that there are opportunities using WSUD to re-use grey water for irrigation and toilet flushing for individual dwellings. We remain committed to the idea of non-potable water supply to each household to reduce the long term demand on Canberra's potable water supply. However, we acknowledge that there are other options aside from a third pipeline reticulating non-potable water from the treatment works, such as reticulating water from other collection ponds, the utilisation of grey water on site for gardens, as well as systems that treat grey water on-site, allowing a more flexible usage.

Under current law, Molonglo is required to achieve a 40% reduction (as compared to 2003 levels) in mains water use. The Government must ensure this is implemented and aspire to achieve even greater water efficiency. Given the high impact of using water efficient fittings and appliances in single and multi-use developments, we would encourage mandating best practice water efficiency measures for all new homes to be built at Molonglo. Water efficient fittings and appliances rated 4 (WELS rating) and above are now widely available and should be the minimum standard for Molonglo (and should be considered for the whole of the ACT for replacement products.)

Water smart meters provide information about consumption use and patterns of consumption, helping householders to manage water consuming behaviours, as well as identifying leaks early.

Issues for clarification:

Cost

- What are the costs associated with the various options, including indirect but associated costs such as energy used for pumping water up from Molonglo for the third pipeline option?
- Which grey water management options deliver best value for money for the residents of Molonglo?
- Who is responsible for the cost of the initial infrastructure for both suburb / precinct level reticulation and on-site equipment?

Regulation

- What has been done in regards to establishing regulation for on-site and reticulated grey water systems?
- Is a review of grey water management required?
- Who maintains responsibility for maintenance for regulation of on-site systems and off-site infrastructure?

Interaction with other urban water management issues:

- How does the management of suburb wide grey water interact with the sewerage system flows?
- How will rainwater management be integrated? Should this be harvested at a suburb or household level, or both?
- What is the impact on our river system if we harvest stormwater en masse in the ACT?

8. Open spaces and nature reserves

Intended policy outcomes

- preservation of key areas of open space, wildlife corridor, and riparian zone protection
- ecological considerations taken into account
- links to Kama woodland, provide a green belt
- keep open spaces accessible to wider community and link to path network (perhaps creating a larger corridor of open space across the whole of Molonglo, and linking to Lake Burley Griffin)
- minimise human and domestic animal effects on ecologically significant areas, make Molonglo a Cat containment area

Given that the Molonglo Valley development is the last large-scale area set for Greenfield development in the ACT, it is vital that it is developed with the preservation of key areas of open space, wildlife corridor, and riparian zone protection in mind. The

increased demands and needs placed on open spaces as a result of a denser city mean that development in this Valley must taken ecological considerations into account far better than the development of Gungahlin did.

The principal objectives of retaining open spaces should be to:

- protect and improve open space provision in terms of ecological quality/ quantity/ accessibility/ safety. These spaces include a range of open spaces eg: school playing fields, private sports grounds, allotments, burial grounds, wildlife sites, playgrounds and amenity areas near multi-unit housing;
- improve linkages within and between the open space network including wildlife corridors and to the wider public realm; green belt – corridors – access to Kama,
- ensure open spaces meet the needs of all local people and promote greater social inclusion, including groups which have traditionally suffered exclusion such as children, disabled people, minority ethnic communities, older people and women;
- identify opportunities for improving access to and the accessibility of open spaces, particularly by promoting public transport, cycling, walking and improving access and facilities for disabled people.
- preservation of reserves, access for recreation, minimisation of human and domestic animal effects - Cat containment area
- provide spaces for sport and recreation
- link with urban stormwater management areas and riparian zone

9. Protection of river corridor and riparian zone

Intended policy outcomes

- no large dam – chain of ponds instead
- riparian zone protected and managed for ecological outcomes
- funding for the establishment of local community group in Waterwatch/ Frogwatch work

Discussion

The Greens remain strongly of the view that the inclusion of a large dam in the Molonglo development is inappropriate for environmental reasons, and that environmental protection values should be given priority over perceptions of what delivers greatest local amenity or land value in the area. Of the original three ideas that were consideration for the management of the river, the Greens favour most strongly the concept of chain of cascading ponds, though also encourage the Government to fully investigate leaving the river as it is but with rehabilitated wetlands and protected river verges.

While a larger lake has been justified in terms of improving water quality, the reality is that other large lakes have been subject to urban run-off with high nutrient loads, predisposing the lakes to outbreaks of blue-green algae. A large lake will reduce the capacity for native fish movements up and downstream, and increasing the likelihood

of invasion by non-native species. The inundation of a lake will also result in the loss of the riparian vegetation currently along the river corridor, and would therefore require some re-vegetations.

The river corridor currently provides habitat for various plant and animal species, which will be at risk with the urban landscaping, and more so with the development of a lake. Of note, studies have identified habitats for the Pink Tailed Worm Lizard and various raptors which nest and have hunting grounds there. While these are two key species, it should not be overlooked that the area provides habitat to a broader range of species, including geckos, skinks, wallaroos, bush rats and platypuses.

The overall principle for “river corridors” is to protect and enhance the environmental quality, landscape setting and the natural and cultural values of the Murrumbidgee and Molonglo River corridors” The National Capital Plan states that river corridors should be protected from urban encroachment, and that the ecological resources and environmental quality should be conserved. The Greens do not believe that a large lake is compatible with these principles, but that a chain of ponds, as evaluated in the Molonglo River Corridor Boundary Study 2007, is more consistent.

A chain of ponds has been shown to be consistent with:

- protection of threatened species habitat
- protect riparian fringe and instream vegetation which leads to improved water quality
- maximise raptor protection
- includes tributaries as part of the corridor system
- includes areas for recreational purposes
- allows for rehabilitation of watercourses important for wildlife movement
- conservation of a Yellow Box Red Gum Grassy Woodland ecotone which provides natural buffers to the river corridor and riparian zone.

http://www.nationalcapital.gov.au/downloads/planning_and_urban_design/draft_amendments/NCA_Molonglo_River_Corridor.pdf

10. Community Gardens and suburban level composting

Intended policy outcomes

- provision of a community garden in each suburb in Molonglo
- provision of composting facilities on each site
- provision of funding for initial facility investment (eg. Tool shed and rainwater tank)

Each suburb should have a site reserved for a community garden, with facilities provided for a suburban level composting site adjoining the gardens. These should be located close to the medium/high density housing in each suburb.

There should be incentives for developers to provide the facilities to compost household waste, thereby reducing the amount of household waste sent to landfill.

Home composting facilities could be provided in houses with gardens and a community-level composting service should be provided for other dwelling types. The composting facilities should be suitable for normal domestic, non-woody garden, food and other compostable household waste. All facilities should be accompanied by information explaining how they work.

11. Public housing

Intended policy outcomes

- dedicate 10% of developments to public housing across Molonglo
- mix of housing types and with a social mix of private and public housing tenants
- high quality, sustainable public housing

We note that the ACT Government has a commitment to ensuring that at least 15 per cent of housing in new estates is affordable. Given public housing currently makes up around 8.6 per cent of total housing stock in the ACT, and the Parliamentary Agreement requires the Government to increase public housing to 10 per cent of total stock, the Greens request that the ACT Government consider dedicating 10 per cent of housing in Molonglo to public housing.

The Greens and the Government are due to have further discussions in the lead up to the 2010-11 budget in regard to achieving the 10 per cent target post the Australian Government stimulus housing. The Greens would like public housing in Molonglo to be a consideration in these discussions.

Multi-unit housing

Public housing in Molonglo should be developed through a mix of housing types and with a social mix of private and public housing tenants. Housing types could include some single residential, terrace housing, and multi-unit complexes.

We would like to suggest that at least one (at least partially public) multi-unit housing complex be built with similar design principles to one outlined in Vienna (see link below). It is focused on providing facilities throughout the building for bicycle users, and has far increased bicycle facilities than standard developments. This includes better bicycle parking, and a car-share system being made available to tenants.

More information is available at:

<http://www.fietsberaad.nl/index.cfm?lang=en§ion=nieuws&mode=newsArticle&repository=Bike+City:+special+apartments+for+bikes+in+Vienna>

The K2 development in Melbourne is a good example of a sustainable multi-unit public housing development. It has been designed for minimum energy and water use over 200 years.

<http://www.housing.vic.gov.au/buildings-projects/completed/k2-apartments>

12. Universal design

Intended policy outcome

- ensure that 15% of development in Molonglo meets mandatory universal design criteria

We also note that the Agreement stipulates that 15% of englobo developments should be housing that meets mandatory universal design criteria and this should be included in development conditions.

13. Relevant examples of sustainable development

- Arts Eco Village, Aldinga, South Australia
- BedZed in Beddington UK:
- K2, Melbourne, Victoria
- In Germany the Fraunhofer Institute for Solar Energy Systems has been developing self-sufficient, near-zero energy homes for over 15 years.
- In the United Kingdom by 2016 all new homes will have to be zero emission on heating and cooling.
- Lochiel Park, Campbelltown, SA

Further information on zero emission developments as being developed by the Victorian Government is available at:

http://www.resourcesmart.vic.gov.au/documents/Zero_emissions_zones_Fact_Sheet.pdf

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