CLIMATE CHANGE IN WA – ISSUES PAPER
CITY OF STIRLING DRAFT RESPONSE 2019

In September 2019, the Government of Western Australia released a Climate Change in Western Australia – 2019 Issues Paper, seeking public comment on climate change issues and opportunities to help inform the development of WA's new state climate policy.

This response from the City of Stirling details areas where the City is taking action noting where additional leadership, action and support mechanisms are required from the State Government.

TRANSFORMING ENERGY GENERATION

What are the main challenges for de-carbonizing Western Australia's electricity supply while ensuring adequate generation capacity, security and reliability?

The electricity from the South West Interconnected System (SWIS) that powers the City of Stirling is a relatively carbon intensive energy source. While grid-powered electricity accounts for only a third of the City's total energy consumption, it contributes almost two-thirds of greenhouse gas emissions.

The City of Stirling's primary greenhouse gas emissions from electricity use occur from its buildings, facilities, street lights and irrigation pumps in parks and reserves. Whilst the City can currently install solar PV systems cost effectively on some buildings, there are more significant challenges for the City to power street lights and irrigation pumps on renewable energy, and also other buildings where solar is not feasible. This means that the City is currently more reliant on grid-supplied power for these energy-using assets, and we are dependent on the overall decarbonisation rate of State Government's grid-supplied energy.

There are many challenges for the State Government who need to decarbonize the grid in a quick timeframe to avoid the worse impacts from climate change.

Strategy
There is a lack of commitment and strategic direction, for example despite Australia signing up to the Paris Agreement, there is no requirement for this target to be shared among states, local governments or the private sector; and therefore there are no current West Australian State targets or a mandate to decarbonize. There is also no documented vision for Western Australia's future energy supply and how it will be centralised or decentralised to meet demands using renewable energy supplies. This means that there is no action plan on how to transition to cleaner energy supplies or scheduling of when transition should occur.

Incentives
There is a lack of funding or incentives for the energy industry to decarbonise, for example, there is limited additional support for renewable energy generators to be economically viable and limited support to make battery storage more cost effective.

Regulatory Mechanisms
There are regulatory challenges which need to be overcome. Western Power and Synergy are not currently able to support emerging energy arrangements, for example, power purchase agreements or peer-to-peer energy sharing/trading. The

City would like to utilise these options, if they were available, to reduce emissions and make renewable energy investments more cost effective.
The City is also looking at ways we can better support our community to use less energy and switch over to renewable energy. The City has been investigating the Solar Savers Scheme being delivered in other Australian states where local governments buy renewable energy systems for residents which are payed back via an increase in rates. However the City has been advised by WALGA that this is not currently allowable under the Local Government Act.

Financial Challenges
Up-front financial costs can be significant for emerging technologies such as batteries and electric vehicles. This can affect the take-up and utilisation.

What are the most effective ways to overcome these challenges by 2030?

The City of Stirling recommends that the State Government undertake the following actions to assist to overcome decarbonisation challenges:

Strategy
Agree on a vision, binding greenhouse gas emissions reduction target and renewable energy target for the State related to Australia's commitment to the Paris Agreement, and develop a strategy and plan to achieve this target

Regulation
Revise regulatory frameworks to better enable renewable energy generation, renewable energy procurement, energy storage and decentralised energy sharing between local government facilities and assets.

Incentives
Provide financial incentives, funding and low interest rate loans for renewable energy generation and storage to fast track decarbonisation of the grid. Provide more low-interest rate loans to businesses for the installation and operation of renewable energy generators, to combat the difficulties in getting initial finance for construction.

Create funding programs that would assist households, businesses, local governments and communities to reduce their greenhouse gas emissions. Some examples are those provided by other Australian state governments:

- New South Wales: Energy Saver program for households and business; Clean Energy Initiatives for various groups
- Victoria: $5.6 million investment in the Virtual Centre for Climate Change Innovation Program (2017)
- South Australia: Carbon Neutral Adelaide.

Pricing mechanisms
Update electricity pricing signals for supply and usage of electricity, including removing subsidies to black-electricity generators, and instead providing subsidies to renewable electricity generators. Introduce electricity pricing mechanisms that reflect periods of high or low demand and reflective of the ability to generate sufficient renewable energy supply.

Infrastructure
Upgrade smart meters and other devices to allow users to set appliances (including home or vehicle batteries) to only recharge or require electricity during low pricing periods, such as during times of excess energy generation. Additionally, then allow those users to feedback into the electricity grid to supply electricity during periods of low generating ability.

Projects
Nominating renewable electricity generating projects, electricity storage projects and system upgrades to Infrastructure Australia for Commonwealth funding of necessary infrastructure.

Awareness and education
Commit to provide information, advice and resources to Local Governments, communities and other groups about individual's role in taking action on global warming.

Should the electricity sector make a pro-rata (or greater) contribution to Australia's national greenhouse gas emission targets?

As a minimum target, the electricity sector should be achieving a pro-rata contribution to national greenhouse gas emission reductions.

How fast do you think the transition of the electricity sector should occur?

The science says that for the worst climate change impacts to be avoided, **action is required now**. Australia is a signatory at a federal level to the United Nations Paris Agreement 2016, which sets a goal to hold the rise in global average temperature to well below 2°C above pre-industrial levels, and to pursue efforts to limit the increase even further to 1.5°C.

The Australian Federal Government has set a target to reduce carbon emissions by 26% to 28% by 2030 (on a 2005 base year). However, recent reports have shown that Australia may not on track to achieve this, with the latest Department of Environment and Energy report stating emissions may be reduced by only 7% by 2030 (Department of the Environment and Energy, 2018).

INDUSTRY INNOVATION

What measures have been implemented by your business to lower energy use or emissions?

The City has already completed many projects to reduce black-energy consumption and greenhouse gas emissions using its own funds and via grant funding though the federal Community Energy Efficiency Programme (CEEP) and Local Government Energy Efficiency Program (LGEEP).

To date, the City has already reduced greenhouse gas emissions on average by 381 t $CO_{2\text{-}e}$ cumulative per year. We are currently producing 475,120 kilowatt hours (kWh) of solar energy annually, or 4% of the City's total electricity consumption.

The City has undertaken the following actions and has installed:

- Upgraded Heating, Ventilation and Cooling systems (HVAC)
- Building Management Systems (BMS)
- Efficient condensing boilers in aquatic centres
- Variable speed drives (VSDs) on air-conditioning condenser water pumps in priority buildings and on pool pumps in aquatic centres

- LED lighting in buildings and automation for lighting controls
- Energy efficient fixtures, fittings and equipment
- Hydrozoned landscapes to reduce irrigation pump usage
- A Centralised Irrigation Management System for more efficient irrigation
- Upgraded irrigation pumps to be more energy efficient
- LED floodlights and software based lighting control
- Solar PV systems on buildings
- Solar black matting to heat swimming pool water at aquatic centres
- Solar hot water systems on community facilities
- Geothermal pool heating system at Scarborough Beach Pool.

What are the barriers to decoupling energy use and emissions in the resources sector?

Not applicable to Local Government

Have you assessed the implications of the low-carbon transition for your business or sector? How are these risks disclosed to stakeholders?

The City has developed an Energywise City Plan setting targets for renewable energy generation and greenhouse gas emissions reductions. Some of the actions in this plan will be to investigate the potential opportunities and implications of various scenarios of low-carbon transition.

What exemptions should apply to trade-exposed sectors in reducing our emissions?

The State Government should not be providing financial subsidies or emissions exemptions to trade-exposed sectors that are carbon intensive. Any financial subsidies or exemptions should be directed towards established and emerging low-carbon alternatives, not maintaining the status quo. The State Government should be divesting from sectors that are large greenhouse gas emitters.

How can the Government of Western Australia foster clean industries and technologies?

As noted above:

Strategy
Agree on a vision, binding greenhouse gas emissions reduction target and renewable energy target for the State related to Australia's commitment to the Paris Agreement, and develop a strategy and plan to achieve this target

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FUTURE MOBILITY

What are the barriers to purchasing a low-emissions vehicle for your household or business?

The City of Stirling has a Council-endorsed Fleet Emissions Reduction Action Plan aiming to reduce fleet vehicle emissions by 25% by 2020. Of the City's total fleet emissions the top four greenhouse gas emitters are Waste Trucks 35%, Utes 22%, Cars 16% and Heavy Trucks 11%. Whilst the City has reduced total fleet greenhouse gas emissions by 14%, the main barriers to purchasing electric or plugin-hybrid vehicles are:

- Lack of availability of these vehicles in the market;
- The relatively high cost these vehicles;
- Lack of choice and options for these vehicles in the market;
- Lack of an extensive recharging infrastructure network for these vehicles; and
- Uncertainty about the durability and reliability of these emerging technologies, particularly the distances that can be reliably achieved.

Waste Trucks
To significantly reduce fleet emissions, the City would need to transition from diesel waste trucks over to electric waste trucks. However, this technology is only just emerging and current electric waste trucks do not have the capacity to lift the required number of bins across a large local government area like the City of Stirling. Additionally, the upfront cost for an electric waste truck is approximately a third more expensive than a diesel waste truck.

Utes
The City has a large number of utes that are required for operational activities and there are no alternative hybrid, plugin-in hybrid or electric utes available on the market. This is a significant barrier for the City to reduce its fleet emissions.

Plugin Hybrids and Electric Vehicles
The City has trailed a plugin-in hybrid car but has not yet invested in plugin-in hybrids or electric vehicles. The City does however have approximately 25% of its passenger cars as low emissions hybrid vehicles. The main barriers to incorporating plugin-hybrids or electric vehicles are that until recently there have been limited vehicles available on the market, they have a higher upfront cost and there is a perceived range anxiety for some officers in the City.

What can be done to facilitate the uptake of electric and other low-emission vehicles by local governments in Western Australia?

State Planning Policies
State Government should establish State Planning Policies that require new service station developments (or similar development, including redevelopment of existing facilities) to include rapid recharge/refuelling facilities for electric/low emission vehicles. Similarly, any developments that have car parking should be required to include rapid recharge/refuelling facilities for electric/low emission vehicles.

Financial Incentives
Provide discounted vehicle registrations and/or reduced stamp duty for electric or plugin hybrid vehicles. Provide subsidies for service stations to install rapid charging stations. Increase costs for petrol and diesel vehicles and redirect these funds into subsidies for electric or plugin hybrid vehicles.

Leading by example
State Government fleet should be an example of a zero/low emissions fleet. State Government Fleet Policy should require a higher consideration of fleet emissions and prioritisation of electric or plugin hybrid vehicles.

How can we further encourage use of public transport and active transport, such as walking and cycling?

In Western Australia, transport emissions are the fastest growing segment of greenhouse gas emissions, increasing by 53% from 2005 to 2017.

The City is a subsidiary part of Western Australia's governance structure and is reliant on the decision making of the State Government to have the biggest impact on Climate Change Action within the City's boundary. For over 20 years, the State Government has required local governments to provide for urban intensification in the Central sub-region of Perth along high frequency bus routes and within "activity centres".

Despite this, Perth has remained the Australian City with the highest level of car ownership, lowest level of public transport use, and lowest residential density. Unsurprisingly, with its massive resources sector and Australia's most sprawled City, Western Australia has the highest per person net emissions of CO^2 of any Australian State.

Reducing Perth's reliance on car-based transport requires an integrated approach to urban design, the location and provision of local facilities and infrastructure, public transport routes and active transport infrastructure. This approach needs to consider the journeys people take and how they make them, and this requires alignment at local and state government levels.

Public Transport

The City has created a Local Planning Strategy which will guide planning decisions and sets a vision to focus investment, jobs and growth on corridors and centres around transit. This will improve the quality of the City's suburbs and the overall liveability of the City. The City's Activity Centres and Corridors need to be transformed over time from car dominated environments to places that are attractive and easy for people to walk around, cycle and catch public transport. The City's Activity Centres and Corridors also need to be the focus for a substantial increase in housing, employment opportunities and community facilities and services.

To achieve this better built-form outcome, the City has adopted several plans for the Activity Corridors such as Beaufort Street and Scarborough Beach Road, and in the Activity Centres such as Mirrabooka and Stirling. These plans will increase the density in these areas, reduce the distance from homes to employment, education and shops, and can increase the choice of public and active transport. The City still requires the investment from the State Government in these areas to provide the improved public transport services that will support the increased density and activation of these areas.

The State Government can further encourage the use of public transport by:

- Prioritising infrastructure that supports better urban design and urban intensification adjacent to high frequency public transport routes;
- Targeting public transport infrastructure investment to areas appropriate for urban consolidation;
- Releasing a Western Australian Planning Commission position statement - Decreasing the planning requirements for car parking to prevent an excess of parking and encourage the use of active and public transport. Ensure planning frameworks reduce car parking requirements only where viable alternative transport modes are being provided, to mitigate the current issues around parking congestion in local suburban streets;

- Requiring planning standards to contain provisions relating to providing weather protection (from the sun and rain) for active and public transport users.

Active Transport

The City has invested approximately $2 million per annum for the last 10 years on its Strategic Footpath Program, starting with a deficit of 325km of missing footpaths which is now reduced to less than 200km. Significant and continued investment is required, according to Council Policy, for missing footpaths to be reduced to zero.

In 2015, Council adopted an Integrated Cycling Strategy which outlines the City's approach to supporting bike riding in the City. As with footpaths, significant and continued investment will be required to support a bike route development program.

The City has additionally delivered bike education and support for active travel for many years through the TravelSmart Program and is now partnering with the Department of Transport to deliver the 'Your Move' program that promotes active travel by providing information, materials and support to encourage individual, workplaces and schools to reconsider the ways they travel.

The State Government can further encourage the use of active transport by:

- Providing more funding to local governments for developing footpath programs and delivery of strategic bike routes. Given that the State Government strategies are highly dependent on accommodating a modal shift away from motor vehicles, it is not unreasonable for the State Government to contribute 50% towards achieving mutual objectives;

- Requiring planning standards and engineering standards to contain provisions relating to providing weather protection (from the sun and rain) for pedestrians and cyclists such as shading structures or tree cover over public paths;

- Developing urban design and planning frameworks that consider transport (both active and public) as a part of land use planning; and

- Encouraging on-road bike riding by "integrating where possible, and segregating only where necessary".

How can we ensure that Western Australia isn't left behind in the transition to cleaner transportation?

Not additional comments in relation to the City of Stirling

REGIONAL PROSPERITY

How will climate change affect your regional community?

Not applicable to the City of Stirling

What steps can we take to further enhance the resilience of our regions and our primary industries?

Not applicable to the City of Stirling

How can we support the agricultural sector to participate in the low-carbon transition?

Not applicable to the City of Stirling

What opportunities do carbon offset markets present for Western Australian land managers, including Aboriginal groups?

Not applicable to the City of Stirling

What matters should the State Government take into account in developing a strategy for carbon farming in Western Australia?

A key aspect of carbon farming is the planting and management of trees that will sequester and store carbon. The City of Stirling plants and manages a significant amount of street trees and reserve trees as part of its core business. The City manages approximately 100,000 street trees and has an active program to plant one million trees and shrubs, with the City planting around 10,000 new trees each year. Additionally the City estimates that it manages approximately 500,000 trees in parks and reserves.

The City has calculated that as of 2016, its street trees sequester 807 tonnes of carbon per year as the trees take carbon from the atmosphere and store it in their trunks, leaves, branches and roots; and they have stored a total of 25,180 tonnes of carbon. By 2040, the City will likely manage an estimated 201,000 street trees and it is projected that these will sequester 3,920 tonnes of carbon per year and store a total of 75,174 tonnes of carbon.

This figure does not include trees in parks and reserves which have yet to be included in the City's carbon sequestration analysis.

The key challenge here is that trees planted and managed by the City of Stirling cannot currently contribute to official carbon offsets under the National Carbon Offset Standard and therefore cannot contribute to the City's carbon emissions reduction program. The State Government should include local government tree management in any scope for a carbon farming strategy and should lobby to the Federal Government to include local governments' trees as an allowable offset under the National Carbon Offset Standard.

WASTE REDUCTION

What areas can we target to further reduce greenhouse gas emissions from waste?

The City addresses the greenhouse gas emissions generated by waste across the municipality through waste avoidance campaigns, recycling programs and the diversion of green waste from landfill.

As noted in the discussion paper, the key issue for greenhouse gas emissions and waste is when organic matter breaks down in a landfill in the absence of oxygen. Organic matter needs to be separated from other waste streams so it can be processed.

If feasible, it is better for organic matter to be processed, composted and used on site or in the local vicinity rather than being picked up by waste trucks and

transported across the City for processing. As noted previously, waste trucks are a large contributor to the City's fleet greenhouse gas emissions.

In regards to organic materials, the State Government can further support reducing greenhouse gas emissions by:

- Running an extensive and consistent communication and education campaign encouraging people to avoid waste and/or process organic waste on site when possible;
- Funding organic material processing infrastructure development; and
- Supporting the creation of offtake markets (somewhere for the processed compost to go).

What can households, businesses and government do to reduce their waste and compost more?

The main organic waste streams in Stirling come from green waste and food waste. Households, businesses and government should focus more on preventing waste at source, rather than recycling. The State Government should produce consistent communication toolkits to encourage and promote waste avoidance and support services such as composting, refills, repair shops, reduced packaging and similar. Extensive Waste Education campaigns focusing on Waste Minimisation should be offered and easily accessible and delivered to the community and businesses.

The City is aware that the State Government has set a target to ensure the three - bin system (FOGO) is provided by all local governments in the Perth and Peel regions by 2025. Stirling's Council has not yet endorsed the implementation of the FOGO bin system for residents however the City is monitoring developments in this area. The City currently diverts 100% of green waste from landfill but does not divert organic food waste from landfill yet.

SAFE AND HEALTHY COMMUNITIES

What are the main climate risks for your household or your community?

The City of Stirling has produced a Climate Change Adaptation Plan to address the potential impacts that projected climate change conditions could have on the community.

The main climatic changes likely to be of significance to the City are sea-level rise, increasing temperatures, reduced rainfall and infiltration, and increased frequency and intensity of storms.

The key risks from climatic changes related to safe and healthy communities are noted as follows:

- Increased number of emergency response and recovery operations in relation to floods and storm events;
- Increased number and intensity of fires in bush-fire prone areas;
- Potential decrease in the quantity and/or quality of irrigated public open space resulting from reduced water allocations. This will likely have a direct impact on the provision of suitable green spaces for sport, recreation and leisure activities;

- Increased sun exposure and heat island effect in built up areas, resulting in increased heat-related morbidity and mortality in vulnerable populations such as the elderly or low socioeconomic populations; and decreased levels of physical activity and social connectedness as outdoor activities such as walking in the local neighbourhood decline; and
- Reduced availability of groundwater for unirrigated bushland and street trees leading to vegetation decline, habitat loss and reduced shading of streets.

What can be done to manage these risks?

In relation to irrigation of green public open space, the City is a Gold status Waterwise Council and is consistently reviewing ways to reduce irrigation requirements via hydrozoning, and increase the efficiency and effectiveness of the irrigation system.

The capture and infiltration of all rainwater and increased water efficiency should be prioritised by State Government on both private and public land to maximize groundwater replenishment and reduce demand for water. Measures required include:

- Planning controls requiring permeable surfaces on all private land not covered by buildings;
- Financial support for local government to upgrade infrastructure to prioritize infiltration;
- Upgrades to State Government infrastructure to prioritize infiltration rather than ocean discharge;
- Planning controls requiring rainwater tanks and grey water systems on all new homes;
- Increased restrictions on /monitoring of water use in domestic gardens; and
- Monitoring and restrictions in use of domestic bores.

In terms of managing these groundwater and heat related risks within the recreation, sport and leisure industry, it may require:

- Longer breaks during training sessions and games;
- Scheduling matches, games and training at facilities and public open space to avoid the heat, whether that is a change in time or venue; and
- Focus on enforcing the guidelines surrounding postponing and cancelling events in the case of high temperatures.

In regards to sun exposure and heat island effect, the City is taking steps to reverse tree canopy loss and increase tree canopy cover citywide. The City has an endorsed Urban Forest Plan and is working across both public and private land. In regards to fire risk, the City is undertaking fuel load reduction by eradicating invasive grassy weeds and other weeds as required.

What are your biggest concerns about Western Australia's future climate?

As noted above

What could be done to ensure your community is better prepared for possible climate impacts?

State Government should be coordinating efforts and assisting local governments by developing a State Climate Change Adaptation Plan that local governments can link to and support. Also providing more funding for climate change adaptation actions would enable local governments to implement larger scale projects across key risk areas.

In relation to sport and recreation, funding initiatives to support solutions to addressing climate change would be of benefit. The community is becoming increasingly conscious in relation to sun smart actions and shade; and therefore funding to support sun smart options for sporting and recreational groups who primarily operate in the outdoor environment should be considered.

From a policy perspective, a State Planning Policy should be developed, requiring the built-form to be designed to respond to future climate conditions.

WATER SECURITY

What can we do to encourage Western Australians to use water more efficiently and adapt to a drying climate?

The State Government can encourage residents to use water more efficiently in several ways. From a planning perspective, the State Government should modify the R-codes and introducing State Planning Policies for non-residential buildings for dwellings to have less hard paving and a greater use of water wise plants, also requiring the provision of trees. Additionally, there should be requirements for new developments to have grey-water schemes.

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- Financial support for local government to upgrade infrastructure to prioritize infiltration;
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- Planning controls requiring rainwater tanks and grey water systems on all new homes;
- Increased restrictions on /monitoring of water use in domestic gardens; and
- Monitoring and restrictions in use of domestic bores.

In regards to awareness and education, the State Government should be delivering a campaign to the sport and recreation community, participants and spectators on water shortages and climate change.

Are there policies adopted in other jurisdictions we should consider for Western Australia?

None noted.

What are the best management options to deal with the water security implications of climate change for our agricultural sector?

Not applicable to City of Stirling

LIVABLE TOWNS AND CITIES

What are the key barriers to improved energy efficiency for our built environment?

The energy efficiency of buildings and street lights are two key areas of active interest for the City of Stirling.

Existing Homes

The City has provided free home energy audits for residents for many years. In 2019, the City undertook consultation with its community asking how the City can better assist residents to save energy and generate more renewable energy. When asked about what stops them from saving energy at home, the City received the following key responses from its residents:

Ability to take action

- Money: the up-front cost burden;
- Ownership: privately renting or government housing; and
- Building type: home design and/or age might make it difficult to take action.

Decision-making confidence

- Information: lack of trustworthy independent expert advice available;
- Money: lack of confidence about the return on investment; and
- Time-poor: unable to research potential options thoroughly.

Motivation

- Comfort: wanting to be comfortable at home through relying on modern conveniences;
- Attitude: don't believe it's the household's responsibility;
- Awareness: do not realise how much energy is being used; and
- Already doing: using low energy option or doing energy saving behaviour already.

New Homes

In relation to new homes, key energy efficiency barriers include:

- Lack of leadership – National Building Code does not require high enough energy efficiency star rating;
- Unwillingness of project homes builders to incorporate more than the minimum energy efficiency measures into new development;

- Limited budgets that are time sensitive. New home builders often have restricted budgets that can preclude implementing energy efficiency savings initiatives as longer-term paybacks may not initially offset the larger upfront costs; and
- Larger houses with fewer occupants require an increased demand for heating and cooling, which increases energy consumption per person.

Dark Coloured Roofs

Dark coloured roofs are a barrier to energy efficiency in the built environment. They do not reflect the sun's rays, and instead trap sunlight and heat in roofs of homes which then transfers heat into interior spaces. This means that extra energy is required to ventilate the trapped heat and cool the internal air with engineered solutions which often will require more energy.

Alternatively, a well-insulated roof with a light colour both reflects heat and reduces heat absorption, which then reduces the need for active cooling and this improves overall energy efficiency.

Corporate Buildings and Facilities

The key energy efficiency barriers for the City are upfront costs, scale and complexity: the City has a considerable number of energy consuming assets with varying physical characteristics, energy consumption profiles and operational control, making it a challenge to identify the most appropriate and cost-effective energy reduction solutions.

Street Lights

There are significant energy efficiency barriers for street lights. Western Power owns around 20,000, or 98%, of the City's streetlights. The City has a legal responsibility to provide and pay for the energy used in residential streetlights. As Western Power manages the run-time, installation, maintenance and replacement of streetlights, these streetlights are not considered to be operational assets for the City and are not included in the City's energy consumption or emissions.

However, Western Power streetlights can cost the City approximately $4.1 million or 46% of the City's total energy costs. The tariff Western Power charges the City is not based on energy consumed in either kWh or run-time, but instead includes supply, maintenance and replacement costs.

Switching to energy efficient lights, for example LEDs, will reduce energy consumption and significantly lower maintenance costs as an LED globe has a much longer life and therefore does not need to be replaced as often. However, there is no incentive for Western Power to reduce energy consumption and pass on cost savings due to this regulated, non-contestable tariff structure.

The only opportunity available for the City is to advocate for change. The City is on a WALGA working group and seeks to advocate to replace inefficient streetlights with more efficient (eg, LED) varieties.

What information or tools do you require to improve energy efficiency in your household or workplace?

The State Government should be providing more support for energy efficiency than just information and tools, for example:

- Reduce the daily energy supply charges for electricity as this is a disincentive to being more energy efficient as it reduces pricing mechanisms;
- Provide better planning standards and update State Planning Policies such as the Residential Design Codes to enable better urban design and mandate light roof colours for all buildings in Australia;
- Promote built form outcomes that reduce energy consumption (principally the need for air conditioning and heating);
- Advocate for minimum energy efficiency standards in the Building Code to be increased;
- Provide additional funding for energy efficiency projects for local governments and their residents, similar to what was provided under the Federal Community Energy Efficiency Fund; and
- Develop a reduced tariff for LED street lighting to reflect decreased energy and maintenance costs; and produce a business case for LED replacements, empowering the City to replace Western Power streetlights and recover costs via a reduced tariff.

Additionally, the current Stamp Duty system disincentives 'downsizing' – that is facilitating the ability of existing home owners to move to smaller dwellings as children leave home, and as housing needs change.

It is recommended that the State Government consider reforms to the Stamp Duty system to enable downsizing to happen, without financially disadvantaging those wanting to do so.

What energy efficiency standards or disclosure measures do you support for our homes and offices and the appliances we use in them?

The current energy efficiency standards covering National Australian Built Environment Rating System (NABERS) for offices, Nationwide House Energy Rating Scheme (NaTHERS) for homes, and the energy star ratings for appliances have been used by the City.

How do you think climate change will affect the livability of your neighbourhood or region?

As noted above, the City of Stirling has produced a Climate Change Adaptation Plan to address the potential impacts that projected climate change conditions could have on the community.

The main climatic changes likely to be of significance to the City are sea-level rise, increasing temperatures, reduced rainfall and infiltration, and increased frequency and intensity of storms.

The key risks from climatic changes related to livability are noted as follows:

- Potential decrease in the quantity and/or quality of irrigated public open space resulting from reduced water allocations. This will likely have a direct impact on the provision of suitable green spaces for sport, recreation and leisure activities;

- Increased sun exposure and heat island effect in built up areas, resulting in increased heat-related morbidity and mortality in vulnerable populations such as the elderly or low socioeconomic populations; and decreased levels of physical activity and social connectedness as outdoor activities such as walking in the local neighbourhood decline; and
- Reduced availability of groundwater for unirrigated bushland and street trees leading to vegetation decline, habitat loss and reduced shading of streets.

How can we improve the retention of vegetation, particularly tree canopy, in our cities and suburbs?

Planning Controls for developments

The model of infill development occurring in Western Australia is incompatible with private tree retention. The City of Stirling is losing up to 300,000m2 of tree canopy per year and this is mainly occurring due to inadequate planning controls and a culture of maximizing yield during property development. Whilst local governments are attempting to introduce measures to retain trees where possible, action and support from State Government is also required. This has historically been lacking.

The City of Stirling requests that the State Government undertake the following actions:

Implement tree-related planning controls at a state level to ensure consistency across all local governments which will additionally provide certainty to industry, for example:

- Reduced building footprints and plot ratios and increased open space requirements on development sites to allow room for trees;
- Minimum canopy cover and soft landscaping requirements;
- Requirements for all hard surfaces to be permeable to allow water infiltration and air penetration to support tree growth;
- Requirements for tree retention during subdivision including on small-lots; and
- Requirement for tree planting and canopy cover targets on all new developments.

Advocate for change to the Building Codes of Australia to support tree retention and ensure homes are compatible with vegetation. Requirements should include leaf-friendly roof design and guttering which reduces frequency and consequences of blockages by leaves.

State Government Land

A significant area of tree canopy is lost each year on state government land which directly influences the City of Stirling's citywide canopy cover. This is a result of State infrastructure projects which do not prioritize tree retention and often fail to replant affected areas to replace the canopy lost. Recent examples of this within the City of Stirling include the development of a car park at Osborne Park Hospital and the Mitchell Freeway widening project.

The City of Stirling requests that the State Government undertake the following actions:

- Establish requirements to document, assess and prioritize the retention of mature and significant trees during infrastructure projects;
- Commit to utilising engineering practices and construction methods / materials which enable tree retention, reduced clearing and the replanting of new trees; and
- Establish requirements to undertake canopy replacement plantings on state government land at the completion of infrastructure projects.

State Government Bodies

Additionally, lack of State Government support and commitment to tree retention is responsible for the loss of tree canopy on both private and City controlled land, for example:

- The refusal of the West Australian Planning Commission (WAPC) to apply tree-retention conditions at subdivision stage as requested by the City; and
- Damage to City street trees during infrastructure works by State utility companies, and excessive street tree pruning by Western Power.

The City of Stirling requests that the State Government undertake the following actions:

- Commit to adopt practices which protect existing trees during utility works, and canopy replacement plantings where tree damage or removal is unavoidable;
- Reform State Departments to develop and uphold policies which protect existing trees, and a commitment to support local government efforts to do the same; and
- Implement a whole of Government approach to ensure that all departments and agencies are working in a coordinated and consistent manner towards the protection of existing trees and the planting of new trees.

Canopy Loss in Natural Areas

Canopy loss can be as a result of the clearing of bushland and natural areas for new housing developments at the periphery of the metropolitan area. This is the result of poor land use decisions which prioritises the clearing of undeveloped land over the re-use of already developed land.

The City of Stirling requests that the State Government undertake the following actions:

- Permit new developments only on land already cleared;
- Facilitate land swaps or buy-backs to protect natural areas in private ownership destined for future development; and
- Revise land clearing offset schemes such that suitable offset areas are identified and purchased *prior* to and as a condition of development / subdivision approval.

RESILIENT INFRASTRUCTURE AND BUSINESSES

What are the key climate risks for the primary industry or resources sectors?

Not applicable to the City of Stirling.

Do you currently assess the impact of physical climate risks on your business, assets or infrastructure?

The City of Stirling has produced a Climate Change Adaptation Plan to address the potential impacts that projected climate change conditions could have on its essential services and operations.

The main climatic changes likely to be of significance to the City are sea-level rise, increasing temperatures, reduced rainfall and infiltration, and increased frequency and intensity of storms.

The key risks from climatic changes for City assets and infrastructure is potential loss of and damage to coastal recreational areas and infrastructure from erosion, inundation and storm damage. Additionally, there is a risk of decline in wetlands due to lowering of groundwater table and/or saltwater intrusion; increase in acid-sulphate soils, loss in wetland biodiversity; acidification of water bodies

In regards to coastal risks, the City is being guided by its Climate Change Adaptation Plan and is working through a Coastal Hazard Risk Management and Adaptation Process (CHRMAP). The City has undertaken a Strategic Coastal Processes Study and this study identified the 100 year Hazard Risk Zone, based on the projected sea level rise by 2110, which is enabling the City to identify those areas and take appropriate action.

The City actively undertakes wetland water quality monitoring to determine the status of wetlands, to refine catchment management strategies accordingly.

Is there information which would assist you to do this better?

Coastal Planning policy needs to adapt and take account of emerging data relating to sea level rise. Current CHRMAP is not adapting information quick enough for decadal changes in risk.

What are the best ways to enhance the resilience of public and private infrastructure?

Locate essential infrastructure in areas that are not prone to coastal risks. Ensure that public and private infrastructure is designed to allow for climate change adaption. Lifecycle costings for assets in hazard zones should include removing infrastructure and assets once predetermined triggers are achieved placing the facility at undue risk.

PROTECTING BIODIVERSITY

Can existing land use and biodiversity management practices be modified to reduce vulnerability and improve resilience?

Yes, existing practices can be modified this could be achieved by the following conservation measures which are being implemented by the City of Stirling:

- Protecting already exiting natural areas from further degradation through elimination of threats and disturbances and undertaking restoration efforts;
- Identifying remnant areas of native vegetation in parkland and expanding these substantially into areas not directly used for recreation through eco-zoning and revegetation with local native stock;
- Similarly identifying remnant areas of native vegetation on private lands for the same purpose; and
- Establishing ecological links between already existing natural areas (bushland, wetland, vegetated coastal dunes) with parkland eco-zones and private lands to enhance and strengthen connectivity for flora and fauna transfer thereby increasing biodiversity.

In regards to planning controls, the Environmental Protection Authority only becomes involved in the Scheme Amendment process once a local government has resolved to prepare (initiate) a scheme amendment. This process does not allow for the early involvement of the Environmental Protection Authority in proposals that would result in the loss of native habitat, or the loss of other important environmental features.

This process should be modified so that a local government has the benefit of comment from the Environmental Protection Authority before deciding whether to prepare (initiate) a scheme amendment.

Are there opportunities for new collaborations with landholders or communities to address climate risks and improve biodiversity outcomes?

Yes there are opportunities to address climate risks and improve biodiversity outcomes. The City of Stirling is investigating ways to better engage with community volunteers to enable more diverse ways for residents to be able to participate in activities in bushlands that address climate risks and improve biodiversity outcomes.

In relation to planning controls, existing requirements, such as providing offsets outside of the metropolitan area where land is cleared, should be reviewed. It is the City's view that there is actually a negative biodiversity outcome occurring when protecting land through an offset can be in excess of 30km distance from a site that is to be cleared is.

STRENGTHENING ADAPTIVE CAPACITY

Are there gaps in the availability of adaptation knowledge, climate information or skills for your community, organization or sector? How can these be addressed?

The City is being guided by its Climate Change Adaptation Plan and is working through a Coastal Hazard Risk Management and Adaptation Process (CHRMAP). Coastal Planning policy needs to adapt and take account of emerging data relating to sea level rise. Current CHRMAP is not adapting information quick enough for decadal changes in risk.

What are the main barriers to the adoption of effective climate change adaptation?

Coastal infrastructure is at risk due to sea level rises and higher intensity storm events. This has impacts across local government boundaries and will require costly mitigation actions. Currently all the burden of dealing with this sits with local governments and it is important that State Government provide support in terms of coordination along the coast and funding support.

The key barriers and challenges for effective climate change adaptations are noted in AS5334 - Climate change adaptation for settlements and infrastructure—A risk based approach, and they include:

- Infrastructure assets may cross local government boundaries or, if they are impacted by climate change, may lead to consequences being felt in other local governments. This means that policy, planning and operational decisions may also have consequences for other local governments. However, many local governments are undertaking adaptation actions in isolation;
- Climate change risk management and adaptation requires the involvement of stakeholders who may have diverse views of the problem and solution; and
- Decisions based on historical climate data may no longer be robust, as science indicates that the climate has changed significantly over the last 50 years and will continue to do so.

ADDITIONAL COMMENT– URBAN DEVELOPMENT

The Climate Change Issue Paper has not identified this issue of State Government infrastructure investment decision-making and it is a significant shortcoming as it is an acute Climate Change issue for the State, but also an important opportunity to build the economic, and environmental resilience of the Perth and Peel metropolitan area.

The key issue for the City of Stirling when it comes to implementing Climate Change Initiatives is that State Government infrastructure investment is not supporting the States strategic plan for urban consolidation. The Climate Change Policy provides an opportunity to acknowledge that one of the key Climate Change Initiatives that the State Government has, is its Perth and Peel@3.5 Million Strategic Metropolitan Plan and the realignment of infrastructure investment to support this plan. This can be accomplished by including in State Government infrastructure investment decisions the Cost Benefit Analysis of the direct and indirect impacts on Climate Change.

The City recommends State Government decision making processes for infrastructure investment should be modified so:-

- The State Government recognises that the Strategic Metropolitan Plan (Perth and Peel @ 3.5 million) is a key Climate Change initiative;
- There is a requirement to demonstrate how the investment will reduce or minimise environmental impacts caused by the use of fossil fuels – in particular through increased /reduced dependence on private motor vehicles;
- A negative score is given in any cost benefit analysis for infrastructure projects that will have adverse climate change impacts;

- Urban consolidation is encouraged to increase residential and employment densities in existing urban areas along activity corridors and around activity centres, to reduce travel distances, decrease car dependency and encourage alternative modes of transport.