



Shire of Augusta Margaret River **Local Energy Action Plan**



Natural | Connected | Prosperous



Acknowledgement of Country

The Shire of Augusta Margaret River would like to acknowledge that we are on Wadandi and Pibelmen country whose ancestors and their descendants are the traditional owners of this country.

We acknowledge that they have been custodians for many centuries and continue to perform age old ceremonies of celebration, initiation and renewal. We acknowledge their living culture and their unique role in the life of this region.

The Shire is committed to Aboriginal Australians sharing fairly and equitably in the Shire's cultural, environmental and economic future.

Foreward

Our Strategic Plan for the Future

To ensure an integrated approach to protecting the natural environment that safeguards biodiversity and provides a sustainable environment for future generations.

The Shire of Augusta Margaret River Council is well placed through their legislative responsibilities and links within the community, to influence the greenhouse gas emissions generated by their own activities, local households and businesses, as a result of waste disposal, land use change and transport.

It has been suggested local governments have the capacity to influence activities that contribute up to 50% of our national greenhouse gas emissions.

When combined globally, the efforts of local government and their communities can make a real difference.

Reducing greenhouse gas emissions also has other benefits for local government and their communities, from improving local air quality and traffic congestion to reducing energy costs for residents and businesses to generating new jobs, industries and incomes for local government.

Pam Townshend
Shire President

The Shire of Augusta Margaret is committed to reducing greenhouse gas emissions from its corporate operations and will play a lead role in reducing emissions from our community.

Through implementing this LEAP, Council aims to improve energy conservation and promote renewable energy. The Shire completed an inventory of greenhouse gas emissions from our own activities (corporate) and those within the Shire as a whole (community), taken from base year 2006-2007.

The LEAP identifies a wide range of actions to be undertaken by Council and the community to reduce emissions and achieve the carbon reduction goals. The LEAP guides the implementation of actions.

It is anticipated that the actions detailed in this report will reduce corporate and community carbon emissions and energy costs for future years.

Such actions are likely to bring environmental, social and economic benefits for all residents of the Shire, now and in the future.

Gary Evershed
Chief Executive Officer

Our Strategic Plan for the Future is to ensure an integrated approach to protecting the natural environment that safeguards biodiversity and provides a sustainable environment for future generations.



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Introduction

‘Sustainability’ is the long-term outcome of avoiding depleting critical finite resources for the maintenance of human activities.

The aim of the Local Energy Action Plan (LEAP) is to report on Shire of Augusta-Margaret River (corporate) and community mechanisms to reduce carbon emissions and provide strategies and innovative best practices to ensure the future sustainability of not only local government assets and buildings but those that are important to the community, business, tourism and industry.

Council is committed to using its best endeavours to meet the needs of current and future generations through integration of environmental protection, social advancement and economic prosperity.

**Towards a Carbon
Neutral Shire Reduction
of carbon emissions
for both Corporate and
Community.**

The LEAP is the product of the Strategic Plan adopted by Council in April 2009 and updated Corporate Plan 2017-2021. In October 2018, the Intergovernmental Panel on Climate Change (IPCC) released a special report detailing the likelihood and impacts of global warming 1.5 degrees above pre-industrial levels by 2052, if global emissions are not immediately and drastically cut.

Climate change has resulted in increased extreme weather events like heatwaves, droughts, bushfires and coastal flooding.

The IPCC report found that current national pledges are not enough to limit warming to 1.5degrees.

The window of opportunity to limit the effects of climate change is rapidly closing. The solutions are available. We need to accelerate the transition to renewables and storage technologies and ramp up other climate solutions across all sectors of the economy.

Background

In October 2007 the Shire of Augusta Margaret River made a corporate decision to join the Cities for Climate Protection (CCP) Program.

This declaration signalled our commitment to reducing greenhouse gas emissions as part of its overall environment strategy. As part of Milestone 1 of the CCP program, an analysis of the energy inventory allowed current and future trends for energy consumption to be identified for Council's own operations and the community. This information provided the benchmark from which an emissions reduction goal was established for council and the community. As part of Milestone 2 of the CCP program Council endorsed a commitment to reduce corporate and community emissions CO₂ by 20% by 2020.

The Greenhouse Effect

The Greenhouse effect is the natural system that warms the earth to a habitable temperature. The argument since industrialisation is that human activities, such as burning fossil fuels, vegetation clearance, and poor land management practices has lead to an imbalance in greenhouse gases in the atmosphere.

Surrounding earth are layers of gases and dust particles known as the atmosphere. The atmosphere regulates the temperature on earth by absorbing or reflecting back into space energy from the sun. Solar energy that does not reach the earth warms the land and oceans, which in turn releases this heat in the form of infrared radiation. It is this infrared radiation that is absorbed by greenhouse gases in the lower atmosphere, warming the earth and creating a greenhouse effect.

Western Australian response to climate change

Western Australia is one of the most vulnerable regions to climate change in the developed world. The state is already experiencing climate change impacts - and further substantial impacts are inevitable. The Western Australian Government is rising to the challenge through innovative and collaborative action and is committed to leading the Western Australian response to climate change.

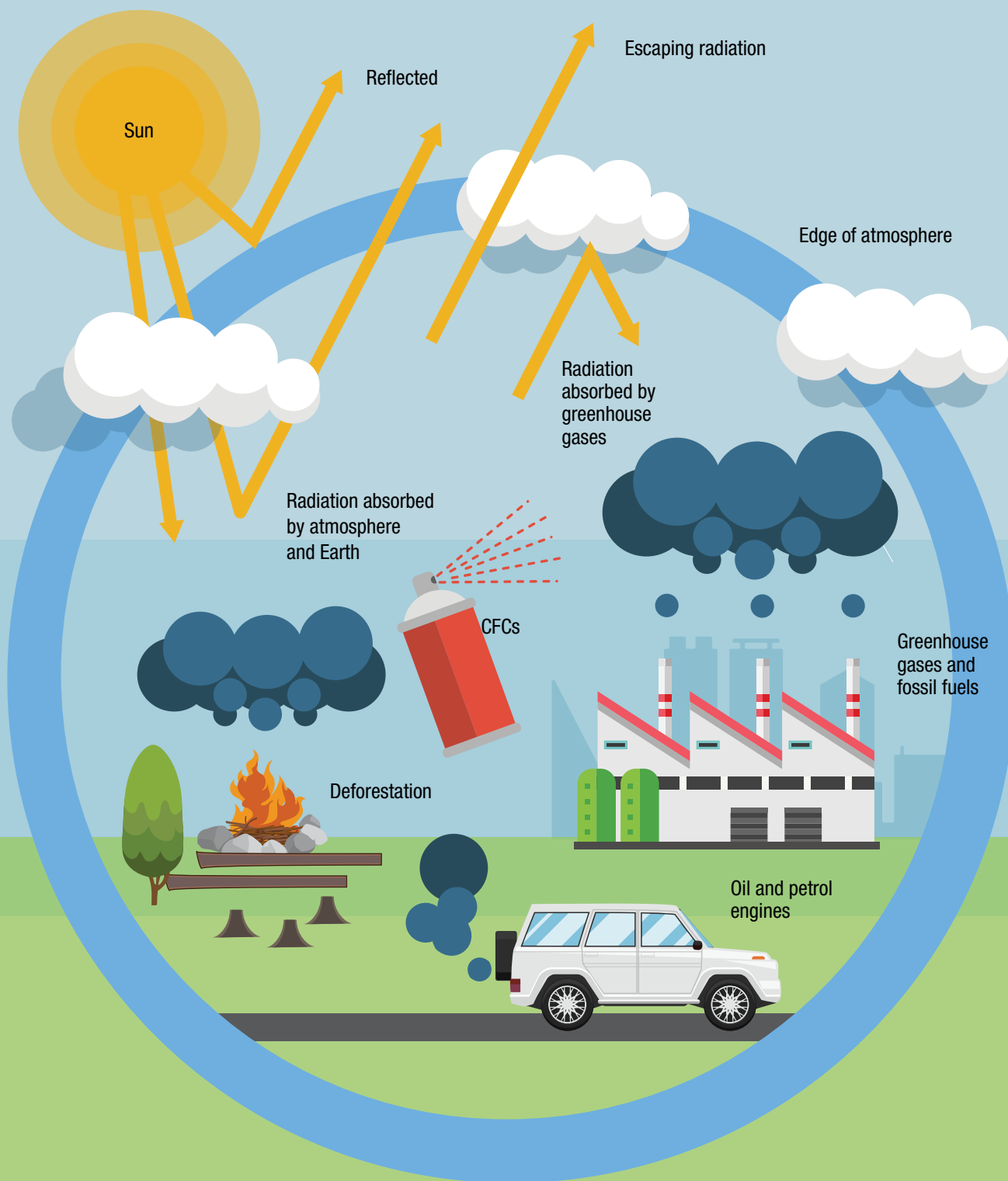
The State Government's Climate Change Unit is located within the Department of Environment and Regulation and is responsible for the whole of State Government's coordination of policy and strategy, regarding the economic, environmental and social impacts of climate change.

International response to climate change

Australia was a participant in the United Nations Climate Change Conference at the historic Paris Agreement on climate change. At the Paris Agreement, all countries agreed to take universal action to limit global warming to 1.5-2° C, to achieve net zero emissions, and to increase resilience to the emerging impacts of climate change. The Australian Government has set initial carbon pollution targets of 25% below 2000 levels by 2020. Australia contributes just over 1% of global greenhouse gas emissions, and has the highest per capita emissions in the world. This is due to 90% of Australia's electricity being generated from coal fired power stations, extensive land clearing, a large agricultural base, high transport use and energy intensive industries and export products.

Greenhouse Gases and the Greenhouse Effect

Human activities, such as burning fossil fuels, vegetation clearance, and poor land management practices has lead to an imbalance in greenhouse gases in the atmosphere.



Objectives and Framework

The objectives of the LEAP can be summarised as follows:

- 1 Assist in making the Shire ecologically integrated;
- 2 Act in a locally and globally responsible manner and protect current and future generations by reducing the Shire's local energy consumption and greenhouse emissions.
- 3 Document the Shire's strategic approach to identifying and adapting to the possible impacts expected from climate change.
- 4 Provide commitment towards the goals set out in the Shire's Corporate Plan and Community Strategic Plan.

The expected benefits from implementation of the LEAP include the raising of awareness and education levels within Council and the community to create an informed and responsible local community as well as the real reduction of greenhouse emissions.

LEAP Framework

The LEAP addresses the following 5 Milestone framework, which was previously used throughout the CCP program. The CCP Program ceased in June 2009 due to the lack of government funding. The Shire resolved to continue with the program based upon the CCP framework below and the need to reduce climate change impacts.

Milestone 1	Establish a base year emissions inventory and forecast for the community and corporate sector
Milestone 2	<ul style="list-style-type: none"> • Set a community emission reduction goal • Set a corporate emission reduction goal
Milestone 3	Develop and adopt a greenhouse reduction strategy – the Local Energy Action Plan
Milestone 4	Implement the Local Energy Action Plan
Milestone 5	Monitor and report on implementation of Local Action Plan measures

Projected forecast emissions and target years

The estimated population for 2020 is approximately 16,300 for the Shire, according to WA Tomorrow. This is an estimated increase of 48% from 2007 to 2020. Corporate and community emissions and costs have been multiplied by 48% as it is expected that an increase in population will also result in an increase in corporate and community emissions and energy costs.

Forecasted costs

The increase in energy costs is based on an annual inflation rate of 3% across Australia as indicated in CSIRO documentation. Therefore, energy costs are expected to increase by 39% between 2007 and 2020. This does not account for increases in electricity costs.

Act locally and think globally to protect current and future generations.



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Milestones

Milestone 1: Energy Inventory Results

Milestone 1 corporate and community inventory was completed in February 2009 and has been endorsed by Council. The report addressed corporate and community emissions and included a summary of Milestone 1 inventory results; and the setting of Milestone 2 carbon emission reduction goals, as follows.

Corporate Emissions Analysis

The corporate emissions analysis is broken down into following three sectors:

- **Buildings** – emissions resulting from energy use (electricity) from Shire owned/managed buildings;
- **Streetlights** – emissions resulting from energy use (electricity);
- **Vehicle Fleet** – emissions resulting from vehicle fleet (petrol and diesel) from Shire operated vehicles and machinery.

Community Emissions Analysis

Community emissions is broken down into the following sectors:

- Residential – emissions resulting from energy use (electricity) from residential buildings;
- Business – emissions resulting from energy use (electricity) from commercial and industrial sectors;
- Waste – emissions from the breakdown of organic and industry waste in landfills originating from community activities.

Milestone 2: Carbon Reduction Goals

In establishing an emissions reduction goal Council considered:

- Resources available to achieve carbon reduction goals.
- Attitude and commitment of Council towards climate change.
- Current and forecasted energy use in the Council and community.
- Community stakeholders.
- Emission reduction goals set by other Council's and actions they have taken to achieve the targets.
- Future changes in legislation that could effect any action taken by Council to curb energy use.

Separate emission reduction goals were decided for the Council and the community, as follows:

Corporate targets

- Reduce emissions generated from Shire buildings and vehicle fleet by 30% below 2006/07 levels by 2020;
- Reduce emissions generated from street lighting by 20% below 2006/07 levels by 2022.

Community targets

- Assist community to reduce emissions by 20% below 2006/07 emission levels by 2022.
- Encourage community to source 25% of its energy from renewable energy sources by 2022.

Milestone 3: Local Energy Action Plan

The LEAP is a blueprint of effective and practical measures to reduce the greenhouse gas emissions generated throughout the organisation and the overall community. When implemented, the LEAP will enable the Shire and community to meet the emission reduction goals set out in Milestone 2.

Milestone 4: Implementation Stage

Milestone 4 will be achieved when the LEAP has been adopted by Council and actions identified in the LEAP have had resources allocated and are therefore slated for implementation. Implementation is the key to the success of the 5 Milestone framework as it is the implementation of measures that will result in emission reductions. Ranking or weighting of actions in the LEAP are based upon the following 4 components:

- 1 Project costs
- 2 Payback period
- 3 Time scale of the project
- 4 Estimated reduction in carbon emissions.

Milestone 5: Review and Evaluate

Milestone 5 consists of conducting an inventory and review following each financial year and will consist of the following elements:

- Identify the level of progress in achieving actions;
- Determine the level of emissions reductions and abatement;
- Determine progress towards carbon emission reduction targets; and
- Revise any actions that may need amendment following information derived from energy audits or other relevant sources.

Creating an informed and responsible local Council and community as well as the real reduction of greenhouse emissions.





1.0 corporate

To achieve the set corporate emission reduction goals by 2020, the Shire will need to reduce its corporate emissions to 2,006 tonnes (tCO₂) (Table 1) by 2020.

A number of carbon reducing actions have been implemented by Council since adopting LEAP in 2010. As at the end of 2016/17 financial year the corporate sector has, reduced emissions generated from buildings and vehicle fleet by 19%. At the same time, emissions generated from street lighting has increased by 5% compared to 2006/07 levels. Further actions are required to be implemented to reduce carbon emissions and annual expenditure on energy.

2006/07	Building	Vehicle Fleet	Total (Building & vehicle fleet)	Streetlights
Emissions	1,367	853	2,219	324
Cost \$	222,000	310,000	532,000	82,000
Forecasted emissions by 2020				by 2022
Emissions	2,133	1,330	3,463	531
Cost \$	309,000	431,000	740,000	134,000
Council Target for 2020				by 2022
Emissions	956	597	1,553	259
Cost \$	155,000	217,000	372,000	66,000

**Table 1: Corporate projections and targets
(using 56% (2020) for buildings/vehicle fleet and
64% (2022) for street lighting service population increase)**

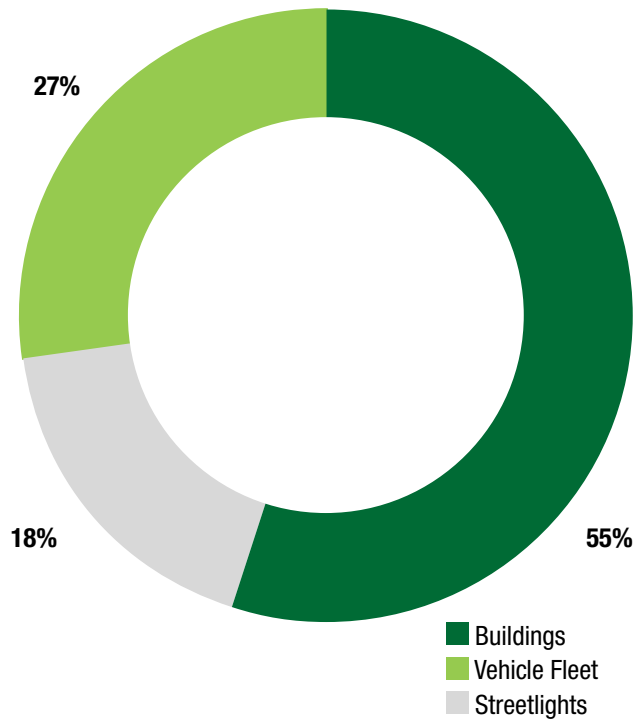
Energy consumption by sector

- 1 Buildings (54%)
- 2 Vehicle Fleet (29%)
- 3 Streetlights (17%)

Figure 1 below indicates the percentage of corporate emissions generated from each of the above sectors during 2006-2007 financial year.

The annual energy costs for 2006-2007 financial year (electricity, vehicle fleet, street lighting) were \$613,000. Note that there are additional costs relating to community waste management.

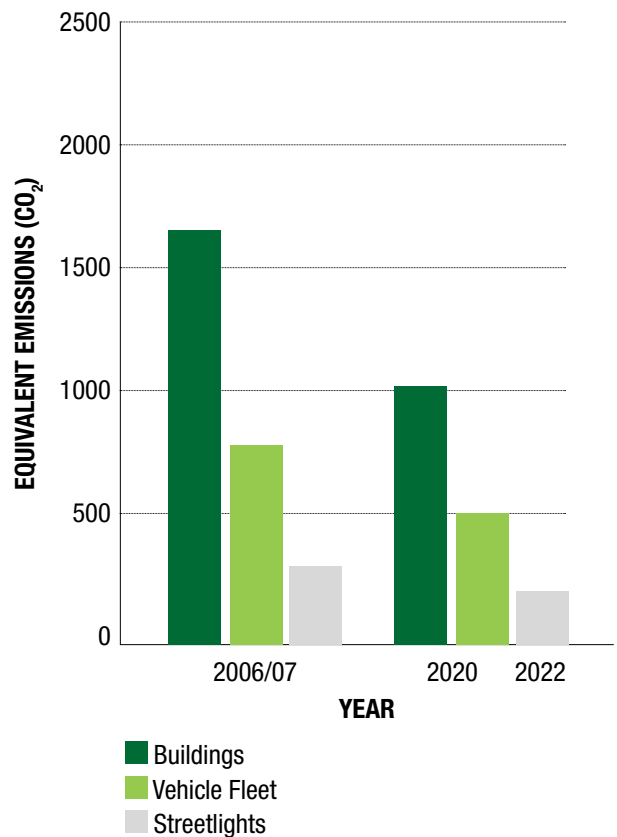
Figure 1: Corporate Emissions by Sector



Corporate Base Year and Forecast Year

The base year selected by Council for the corporate emissions inventory was the 2006-2007 financial year. The forecast year is 2020 for buildings/vehicle fleet and 2022 for street lighting.

Figure 2: Base Year (2006/07) and emission targets for 2020 and 2022





1.1 Building

Introduction

The buildings inventory relates to all Shire vested buildings that the Shire owns and manages, and pays electricity for.

Main Contributing Factors To Energy Use

The following buildings make up approximately 90% of the Shires energy consumption, costs and emissions.

1. Recreation Centres

Recreation Centre (Margaret River)

Energy consumption includes heating of the two pools, dehumidifier, showers, lighting, air conditioning and UV sterilisers.

Civic Centre (Augusta)

The Civic Centre, located in Augusta, includes the Hydrotherapy Pool, Shire Administration Building, Augusta Recreation Centre and the Information Centre.

The main energy uses include, heating of the pool, lighting, air conditioning and general appliances and equipment.

Accordingly, strategies and actions for the Civic Centre will target the Recreation Centre and the hydrotherapy pool.

2. Caravan Parks

Flinders Bay and Turners Caravan Park

Energy consumption relates to lighting, cooking, refrigeration, air conditioning in addition, hot water heating.

3. Administration Centres Margaret River Shire Offices

Energy consumption relates to air conditioning, IT equipment and lighting.

Margaret River library

Energy consumption relates to air conditioning, lighting and IT equipment.

4. Margaret River Shire depot

Energy consumption relates to machinery, lighting, IT equipment, heating, and cooling.





Energy consumption, emissions and costs as at 2016-17

Sector	Recreation Centres		Caravan Parks		Administration Centres		Depot	Total
	Civic Centre	Recreation Centre	Turner Caravan Park	Flinders Caravan Park	Shire Offices	M/R Library	M/R Shire Depot	
Electricity consumption (GJ)	253	3,584	1,019	473	881	159	206	6,575
Total carbon emissions (tCO ₂)	62	850	247	108	201	31	46	1,546
Electricity costs (\$)	17,000	232,000	67,000	31,000	66,000	16,000	18,000	\$447,000

Strategies and Actions

The building sector makes up approximately 55% of the Shire's corporate energy use therefore; the majority of actions from LEAP will target the building sector.

Strategies	Actions	When	By who	Cost	Emission reductions (tCO ₂)
Recreation Centre (Margaret River)					
1. Improve energy efficiency	Install add-on features to the recently installed dehumidifier to improve energy efficiency	2018-19 onwards	Community Development, Sustainable Development	Approx \$10k	Reductions to be determined through quotation process. Actions will improve energy efficiency
	Investigate installation of LED lighting on Gloucester Park sport ovals	On-going	Community Development, Sustainable Development	Business case	
	Install a C bus system for lighting at a central location	2019-20	Community Development, Sustainable Development	Approx \$8-10k	
	Investigate installation of an 80kW (approx) solar PV system addition at the Recreation Centre and/or Shire administration building following a detailed business case	2019-20	Community Development, Sustainable Development	Business case	
Administration Centre					
2. Improve energy efficiency	Install a manual air conditioning system in the Shire's council chambers to ensure more effective use of electricity	To be determined	Infrastructure	Request for quotation required	Improve energy use. Reductions to be determined
Caravan Parks					
3. Improve energy efficiency	Install commercial heat pumps or gas boosted system to improve water heating at Flinders Caravan Park	2018-19 onwards	Community Development, Sustainable Development	Request for quotation required	Improve energy use for the future
	Continue to work with Planet Footprint (or similar) to manage the Shire's energy and fuel data.	On-going	Sustainable Development	\$7,000 p/a	Improves energy awareness
General (for all building categories)					
4. Increase renewable energy	Install solar PV installation at the Augusta Civic Centre and the Margaret River Shire depot (approx 20kW) following a review of structural requirements	2018-19	Finance, Sustainable Development Infrastructure	Approx \$25k	Approx 25(tCO ₂) per annum
	Install 60kW (approx) solar PV system on the roof of the new HEART project following review of projected energy consumption	2018-2020		Approx \$80k (partial funding already secured)	Approx 32(tCO ₂) per annum
	Prepare energy audits for largest Shire buildings, and implement outcomes of audits following review of cost/benefit and energy efficiency	On-going		On-going	On-going

General (for all building categories)					
4. Increase renewable energy (continued)	Prepare council policy/guidelines to mandate inclusion of energy efficiency requirements and investigation of energy generation for new Shire buildings/additions, public open spaces, major developments etc.	2019-20	Finance, Sustainable Development Infrastructure	Undefined	Undefined
	Investigate voltage optimisation potential to reduce unnecessary electricity consumption at larger sites	2019-20	Finance, Sustainable Development Infrastructure	2019-20	To be determined
	Engage an electricity broker to negotiate new electricity contract, advising on solar PPA options as desired	2018-19	Finance, Sustainable Development Infrastructure	Undefined	
	Consideration of purchasing energy from a renewable facility if one is developed in the future.	Future opportunities	Sustainable Development, Finance	To be determined	To be determined

Where installations or projects require expenditure from Council a business case for each action/project would be prepared taking in to account payback period.

1.2 Vehicle Fleet

Introduction

The light vehicle fleet refers to all vehicles that are included as part of an employees' salary package. On average, each of our light fleet (cars, utes) travel approximately 20,000km during one financial year, yet generated less emissions in comparison to the heavy vehicle fleet, due to smaller engines. The heavy fleet relates to all heavy vehicles and machinery used throughout Shire depots. The heavy vehicle fleet makes up approximately 90% of the Shire's fuel consumption, as such actions will target reducing emissions in this area.

Strategies and Actions

Strategies	Actions	When	By who	Cost	Emission reductions (tCO ₂)
Improve heavy vehicle fleet efficiency	Use of alternative sustainable fuels where proven, cost effective and readily available	On-going	Depot, Sustainable Development	Future research	To be determined
Increase alternative modes of transport	Purchase EV/hybrid vehicles or solar powered equipment where it is proven efficient and cost effective	On-going	Sustainable Development, Community Service	To be determined	Behavioural change. Emission reductions to be determined
Off-set light and heavy vehicle fleet emissions	Purchase emission offsets each year through an accredited company as a means of off-setting emissions generated from the Shire's vehicle fleet	On-going	Sustainable Development	Approx \$10,500 p/a	550 (tCO ₂)
	Investigate a carbon offsetting project with local landowners and an accredited offsetting organisation through re-vegetation of private land under covenant	On-going	Sustainable Development		To be determined

1.3 Streetlighting

Introduction

Street lighting considers the energy consumption of street lighting, which accounts for approximately 11% of local government energy consumption. The Shire of Augusta-Margaret River has approximately 1,300 street lights, which is progressively increasing as new subdivisions are completed. High pressure sodium lights are typically used on major roads where a higher lighting intensity is required. They are the most energy efficient form of lighting and have the longest useful life. Mercury vapour lights are commonly used on local streets within subdivisions, are less efficient and have a shorter useful life. Metal halide lights produce high light output for their size, making them a compact, powerful, and efficient light source, typically used in industrial areas.

Main contributing factors to energy use

The following lights are currently being used throughout the Shire.

Light	Description	Useful Life (hours)	Efficacy (lumens/ watt)	Number of lights 2006/07	Number of lights 2016/17
High Pressure Sodium	High intensity discharge lamp ranging from 150 to 250 watts. Uses sodium vapour in a high pressure arc tube	14,000	100	67	106
Mercury Vapour	A high intensity discharge lamp ranging from 50 to 125 watts. Uses mercury as the primary light producing element	12,000	55	987	1,219
Metal Halide	A high intensity discharge lamp – 150 watts. Uses mercury and halide additives as light producing elements	8,000	80	26	2

Strategies and Actions

Strategies	Actions	When	By who	Cost	Carbon reductions (tCO ₂)
Look at alternative forms of energy for street lighting	Establish a collaborative approach with WALGA and other local governments with the aim of replacing existing street lights with energy efficient street lights	On-going	Infrastructure, Sustainable Development	No costs envisaged	Future calculations to be made
	Investigate a streetlight pilot program in one of the Shire's recreation reserves using alternative and effective lighting technology	To be determined	Infrastructure, Sustainable Development	Request for Quotation required	Future calculations to be made
	Investigate opportunities for installation of LED lighting in newly proposed subdivisions	On-going	Infrastructure, Sustainable Development	No cost	Future calculations to be made

Street lighting considers the energy consumption of street lighting, which accounts for approximately 17% of the Shire organisation (corporate sector) energy consumption.





2.0 Community

To achieve the set community emission targets by 2020, AMRSC will need to reduce its community emissions to 66,547 (tCO₂e) by 2020. Implementation of actions in this section will assist in achieving the community carbon reduction goals.

Carbon emissions tCO ₂ in 2006/2007 (base year)	Residential	Business	Waste	Total
tCO ₂	35,134	36,850	18,862	90,846
Projected emissions by 2022				
tCO ₂	57,620	59,991	30,934	148,987
Target for 2022				
tCO ₂	28,107	29,480	15,090	72,677

Table 1: Corporate Emissions Targets Projection and Target (using replace with 64% service population increase)

Order of priority

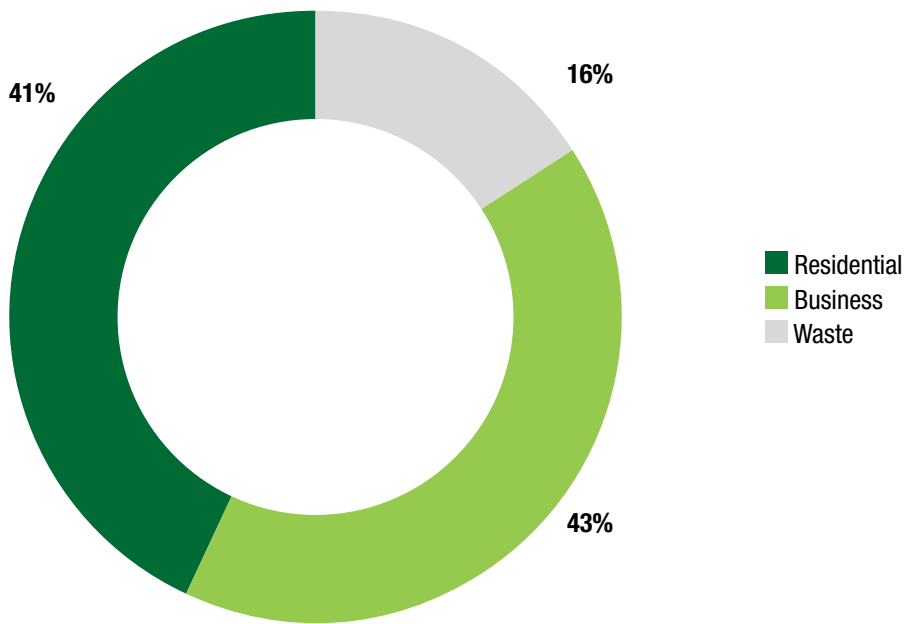
- 1 Residential (41%)
- 2 Business (42%)
- 3 Waste (17%)

Community Emissions Analysis

The community emissions analysis is broken down into three main sectors:

- 1 **Residential** – emissions resulting from household energy use (electricity)
- 2 **Business** – emissions resulting from commercial and industrial energy use (electricity)
- 3 **Waste** – emissions resulting from the breakdown of waste in landfills originating from the community.

Figure 1: Community Emissions by Sector



Community Base Year and Forecast Year

Forecast calculations are based on a 'business as usual' scenario allowing for growth within the municipality of population and its associated effects.

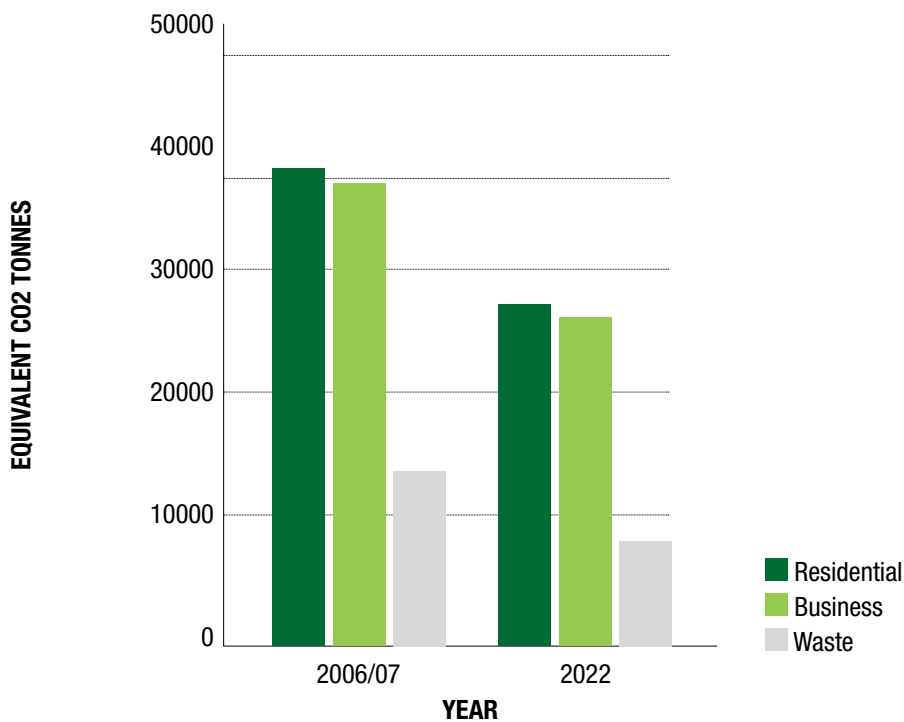


Figure 2: Base Year (2006/07) and emissions/energy use targets by 2022



2.1 Residential

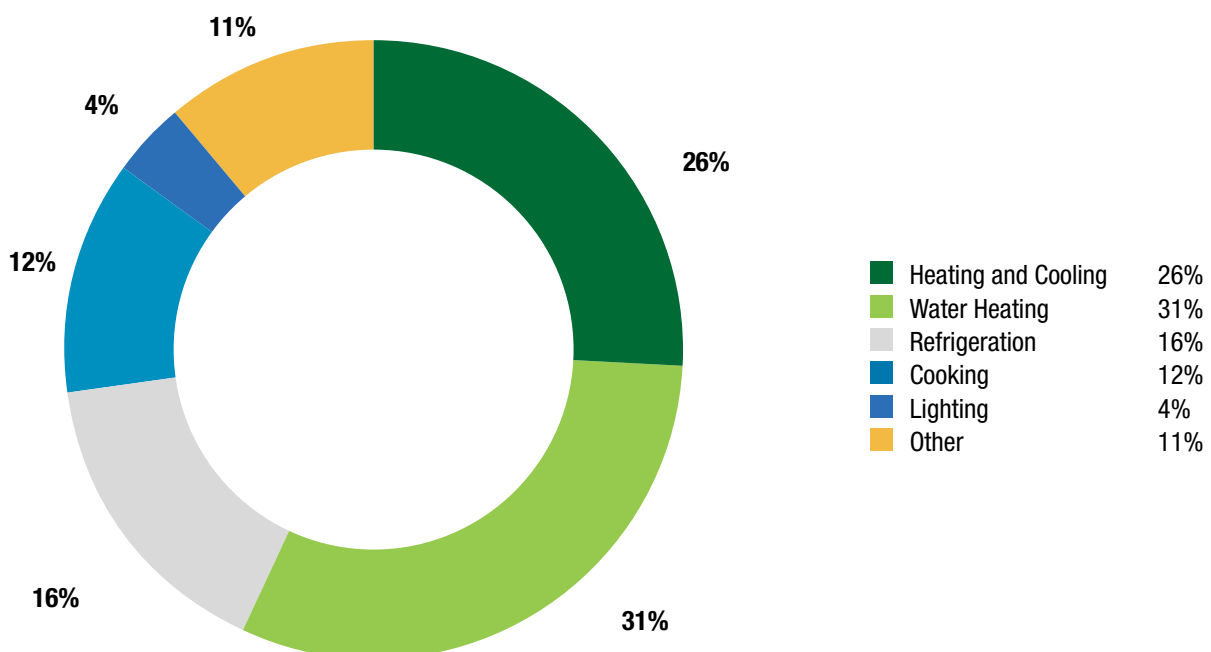
Introduction

Residential energy consumption data relates to all dwellings throughout the Shire. Reducing residential energy reduction is considered the most effective way to reduce carbon emissions. A number of government programs have already been set up to assist home owners.

Main contributing factors to energy use

The following table indicates typical residential energy use in the south-west of Western Australia.

Figure 1: Residential Energy Consumption



Strategies	Actions	When	By who	Cost	Carbon reductions (tCO ₂)
Increase renewable energy	Provide support towards the proposed large-scale community renewable energy project	On-going	Sustainable Development	Staff resources	To be determined
	Review the Dunsborough Community Energy project to see if it can be replicated in our Shire.	On-going	Sustainable Development	Staff resources	To be determined
Increase awareness of energy use	Implement Living Smart or alternative sustainability education course i.e. low Impact Living workshops, on an annual basis, inclusive of a session on 'speed date a solar expert'	On-going	Sustainable Development	Approx \$6000	Best practice
	Provide administrative support i.e. promotion of events etc. to Transition Margaret River to educate the broader community on sustainability related matters	On-going	Sustainable Development	No cost	To be determined
	Work with developers to include solar passive design in any future display home	On-going	Sustainable Development	No cost	Best practice
	Include the latest information on the website/other sources on how to save energy at home, sustainable design, alternative transport and waste education opportunities, solar PV financing, bulk buy opportunities, and progress on emission targets	On-going	Sustainable Development	To be determined	Best practice
	Purchase thermal imagery camera to assist homeowners to detect areas of the home that are performing inefficiently.'	2019-20	Sustainable Development	To be determined	Best practice
	Utilise the Margaret River and Augusta libraries as a platform for environmental education, show casing sustainability	Internal resources	Sustainable Development	Internal resources	Best practice
	Investigate opportunities for home energy audits	On-going	Sustainable Development	To be determined	To be determined
	Organise, in partnership with the Sustainability Advisory Committee, a Climate Action Summit to be held in the first half of 2019, for community members, Council, the Shire and State and Federal Government representatives to develop comprehensive and ambitious and well considered actions on climate change that can be undertaken by the whole community, and inform Council's Climate Action Plan.	Early 2019	Sustainable Development	To be determined	Best practice

2.2 Business

Introduction

Business energy consumption relates to wineries, town centre, accommodation, the tourism industry, farms and light industrial areas throughout the Shire.

Main contributing factors to energy use

- 1 Wineries** – the majority of energy consumed within wineries includes refrigeration (up to 60%), pumping and mixing, hot water heating, lighting, electric motors and machinery.
- 2 Town Centre buildings** – the majority of energy consumed within town centre shops includes lighting, and heating and cooling.
- 3 Hospitality** – the majority of energy consumed within hospitality includes lighting, cooking, heating and cooling.
- 4 Farms** – the majority of energy consumed on farms is used for irrigation, water heating, lighting and ventilation and other machinery.
- 5 Light Industrial Area** – this includes energy relating to machinery use, lighting, refrigeration and heating and cooling.

Strategies	Actions	When	By who	Cost	CO ₂ reductions (T)/ energy changes
Promote energy efficiency	Engage established eco focused building companies to host a one-day seminar, which promotes use of energy efficient technologies and energy efficient building strategies	Ongoing	Sustainable Development	To be determined	To be determined
Increase use of alternative energies	Amend the Shire's Sustainable Design Policy to include requirements for: <ul style="list-style-type: none"> • solar PV's on all new commercial buildings; and • solar PV's to be incorporated at a subdivision level 	Ongoing	Sustainable Development	Staff resources	To be determined
Encourage carbon offsetting initiatives	Investigate community wide carbon offsetting as part of the Gondwanalink project and publicise outcomes of the project	2018/19	Sustainable Development	Staff resources	To be determined
	Host annual seminars to promote renewable energy opportunities and energy efficient building strategies	On-going		Approx \$5k	Undefined
	Review the Shire's Sustainable Design Policy to include sustainable design and/or solar PV installations for commercial buildings and residential subdivisions	2018-19		Staff resources	Undefined

2.3 Waste

Introduction

The waste inventory addresses all waste that was sent to landfill which could not be recycled, including paper waste, building and debris, plastics, metals and toxins, food waste and other contaminants.

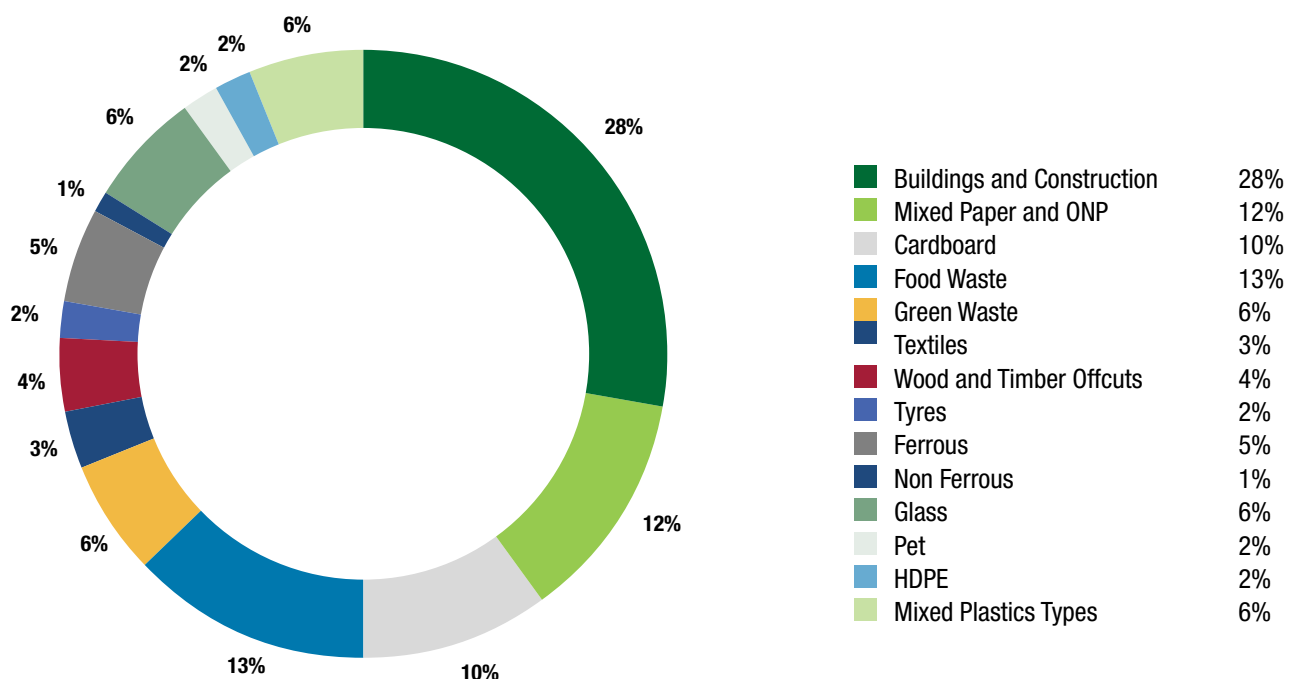
Main contributing factors to energy use

The table below is an indication of what makes up community waste to landfill. The pie chart further below provides a % breakdown of what types of waste goes to landfill. Strategies and actions should be developed to ensure that the following waste sectors are reduced.

Strategies and Actions

Sector	Actions	When	By who	Costs	CO ² reductions (T)/ energy changes
Improve recycling procedures	Investigate green and organics waste at Shire facilities and encourage community to do the same through educational material	On-going	Waste Department		Best Practice
	Investigate green and organics waste recycling initiative as part of the Waste Master Plan	On-going	Waste Department, Sustainable Development		Best Practice
	Improve recycling initiatives as part of the Waste Master Plan	On-going	Waste Department, Sustainable Development	To be determined	Best Practice

Figure 1: Analysis of Waste to Landfill by Composition 2006-2007



3.0 Implementation

Implementation of LEAP will be undertaken by various business units within the Shire. Implementation of actions set out in the LEAP has the potential to benefit the Shire and its community by reducing energy costs, reducing reliance upon finite resources and by improving health air quality. For the LEAP to be successful, a whole of organisation approach to implementing the actions must be taken.

Before each action is implemented, the following four components should be considered. This will ensure that each action is quantifiable and can be measured against set carbon reduction goals.

- 1 Project costs
- 2 Payback period
- 3 Time scale of the project
- 4 Estimated reduction in carbon emissions

4.0 Review and re-inventory

Annual inventory

An inventory of progress against adopted emission reduction targets will be undertaken at the end of each financial year. This will determine how the Shire and community are tracking towards these targets.

LEAP review

Future review of LEAP will be subject to outcomes stemming from the Climate Action Summit planned for 2019. The intent is to incorporate the LEAP into a future Climate Change Response Plan which will set out bold and holistic approaches to the issue involving cooperation with all sectors in the community.





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