



09 February 2022

NOTICE OF MEETING

Dear Committee Member,

The next Environmental Advisory Committee meeting will be held at 6.00 pm on Wednesday, 16 February 2022 in the Committee Room, 7000 Great Eastern Highway, Mundaring.

The attached agenda is presented for your consideration.

Yours sincerely

A handwritten signature in blue ink, appearing to read "Jonathan Throssell".

Jonathan Throssell
CHIEF EXECUTIVE OFFICER

Please Note

If an Elected Member has a query regarding a report item or requires additional information in relation to a report item, please contact the senior employee (noted in the report) prior to the meeting.



AGENDA
ENVIRONMENTAL ADVISORY COMMITTEE MEETING
16 FEBRUARY 2022

ATTENTION/DISCLAIMER

The purpose of this Committee Meeting is to discuss and make recommendations to Council about items appearing on the agenda and other matters for which the Committee is responsible. The Committee has no power to make any decisions which are binding on the Council or the Shire of Mundaring unless specific delegation of authority has been granted by Council. No person should rely on or act on the basis of any advice or information provided by a Member or Employee, or on the content of any discussion occurring, during the course of the Committee Meeting.

The Shire of Mundaring expressly disclaims liability for any loss or damage suffered by any person as a result of relying on or acting on the basis of any advice or information provided by a Member or Employee, or the content of any discussion occurring during the course of the Committee Meeting.

CONTENTS

1.0	OPENING PROCEDURES	4
1.1	ANNOUNCEMENT OF VISITORS	4
1.2	ATTENDANCE/APOLOGIES.....	4
2.0	ANNOUNCEMENTS BY PRESIDING MEMBER WITHOUT DISCUSSION	4
3.0	DECLARATION OF INTEREST	4
3.1	DECLARATION OF FINANCIAL INTEREST AND PROXIMITY INTERESTS	4
3.2	DECLARATION OF INTEREST AFFECTING IMPARTIALITY	4
4.0	CONFIRMATION OF MINUTES OF PREVIOUS MEETINGS	5
5.0	PRESENTATIONS	5
6.0	REPORTS OF EMPLOYEES	5
6.1	REVIEWING SHIRE EMISSION REDUCTION TARGETS	5
7.0	URGENT BUSINESS (LATE REPORTS)	41
8.0	CLOSING PROCEDURES	41
8.1	DATE, TIME AND PLACE OF THE NEXT MEETING.....	41
8.2	CLOSURE OF THE MEETING.....	41

**ENVIRONMENTAL ADVISORY COMMITTEE MEETING
COUNCIL CHAMBER, 7000 GREAT EASTERN HIGHWAY, MUNDARING – 6.00 PM**

1.0 OPENING PROCEDURES

Acknowledgement of Country

Shire of Mundaring respectfully acknowledges the Whadjuk people of the Noongar Nation, who are the traditional custodians of this land. We wish to acknowledge Elders past, present and emerging and respect their continuing culture and the contribution they make to the region.

1.1 Announcement of Visitors

1.2 Attendance/Apologies

Members	Cr John Daw	East Ward
	Ms Francesca Flynn	
	Dr Michael Lohr	
	Dr Winsome Santa Maria	
	Mr Alexis Krapez	
	Mr Andrew Wallace	
	Ms Kelly Carlile	
	Mr Michael Waite	
Staff	Angus Money	Manager Planning & Environment
	Briony Moran	Coordinator Environment & Sustainability
	Kylee Van Der Vuurst	Minute Secretary
Apologies	Cr Amy Collins	Central Ward
Guests		

2.0 ANNOUNCEMENTS BY PRESIDING MEMBER WITHOUT DISCUSSION

3.0 DECLARATION OF INTEREST

3.1 Declaration of Financial Interest and Proximity Interests

Elected Members must disclose the nature of their interest in matters to be discussed at the meeting (*Part 5 Division 6 of the Local Government Act 1995*).

Employees must disclose the nature of their interest in reports or advice when giving the report or advice to the meeting (*Sections 5.70 and 5.71 of the Local Government Act 1995*).

3.2 Declaration of Interest Affecting Impartiality

An Elected Member or an employee who has an interest in a matter to be discussed at the meeting must disclose that interest (*Shire of Mundaring Code of Conduct, Local Government (Admin) Reg. 34C*).

4.0 CONFIRMATION OF MINUTES OF PREVIOUS MEETINGS

RECOMMENDATION

That the Minutes of the Environmental Advisory Committee Meeting held 17 November 2021 be confirmed.

5.0 PRESENTATIONS

6.0 REPORTS OF EMPLOYEES

6.1 Reviewing Shire emission reduction targets

File Code	GV.MTG 6/7
Author	Briony Moran, Coordinator Environment and Sustainability
Senior Employee	Mark Luzi, Director Statutory Services
Disclosure of Any Interest	Nil
Attachments	1. Energy and Emissions Reduction Strategy 2018

SUMMARY

This report recommends that the Environmental Advisory Committee forms a working group to review the Shire's emission reduction target, based on a request from Council.

BACKGROUND

In 2018 the EAC supported a draft Energy and Emissions Reduction Strategy, prepared by staff from the Shire and the Eastern Metropolitan Regional Council (EMRC). This Strategy included a target to reduce corporate emissions by 30% by 2030, based on 2016/2017 levels. This Strategy and emissions reduction target were then adopted by Council at its meeting of 11 September 2018 (see Attachment 1).

Shire staff have provided reports to the EAC and Council on progress to date in reducing emissions from the Shire's facilities and operations. The most recent report was reviewed by the EAC at its meeting of 17 November 2021. When that report, and the recommendation of the EAC, was considered by Council at its meeting of 14 December 2021 (C3.12.21) Council resolved to:

- 1. Note the content of this report;*
- 2. Acknowledges that achievement of the '30% by 2030' emissions reduction target adopted by Council in 2018 will require ongoing effort across the Shire;*
- 3. Requests a business case as part of the 2022/2023 budget process to identify funding options and investment priorities to accelerate the Shire's progress towards reducing emissions; i.e. reduction from street lights, lower emission vehicles and potential to buy green energy from alternative; and*

4. Requests the Environmental Advisory Committee review current emission reduction targets with a view to including Scope 2 emissions and advising Council accordingly.

In response to the request from Council (4) the EAC could form a working group to investigate emissions reduction options in depth, or participate in a workshop to help inform further work, as outlined in the comment section below.

STATUTORY / LEGAL IMPLICATIONS

Nil

POLICY IMPLICATIONS

Council adopted an Environmental Sustainability Policy at its meeting of 12 June 2018 (C5.06.18). This policy includes the principles 'the Shire will pursue and promote improved water and energy efficiency, reduced carbon emissions and sustainable use of natural resources.'

FINANCIAL IMPLICATIONS

Financial implications would be explored as part of the review of the Shire's greenhouse gas emission reduction targets.

STRATEGIC IMPLICATIONS

Mundaring Strategic Community Plan 2020 - 2030

Priority 2 - Natural Environment

Objective 2.4 – Energy management that is efficient and sustainable

Strategy 2.4.2 – Improve energy efficiency and adopt low-emissions technology

SUSTAINABILITY IMPLICATIONS

Limiting the extent of climate change by curbing greenhouse gas emissions has social, environmental and economic benefits.

RISK IMPLICATIONS

Risk: The Shire's reputation within the community is at risk if efforts to reduce greenhouse gas emissions are not directed effectively, or monitoring and reporting is not accurate		
Likelihood	Consequence	Rating
Possible	Moderate	Moderate
Action / Strategy		
Review emissions reduction target and maintain monitoring systems in order to report accurately		

EXTERNAL CONSULTATION

External consultation is not required in order to form a working group, or hold a workshop to discuss emissions reduction options.

COMMENT

Local government efforts to reduce greenhouse gas emissions are generally directed first at their own 'corporate' footprint, and may then extend to advocacy for effective state and

national policy, and supporting community and local business emission reduction initiatives.

Full life cycle carbon accounting to consider the 'embedded energy' in materials is complex, and not commonly addressed at the local government level. The emissions generated by contractors and consultants engaged by the Shire is generally unknown and their energy or fuel use is not required to be disclosed. The energy used directly by the Shire in running buildings, facilities, lighting and vehicles is simpler to measure and monitor, and the Shire's carbon footprint to date has been calculated on the purchase and use of electricity, gas and fuels.

There are defined 'Scopes' for different levels of greenhouse gas reporting, published by the Australian Government Clean Energy Regulator. Scope 1 emissions are the most directly generated by an organisation, while Scope 2 and 3 are still linked but further removed from the control of the organisation or specific site.

The process of reviewing the Shire's emission reduction target and strategy would benefit from the expertise available within the EAC. However, broad discussion and debate cannot easily occur within the constraints of the formal committee structure and meeting procedures. Options for review could include a workshop (or series of discussions) that follow on from formal meetings, or formation of a working group which meets outside of the scheduled committee meetings to investigate the issues in more depth.

Either option would then inform further work by Shire staff, with assistance from the EMRC as part of their Achieving Carbon Emissions Reduction (ACER) program. Findings would then be prepared and presented to the EAC for its recommendation to Council.

VOTING REQUIREMENT

Simple Majority

RECOMMENDATION

That the Committee nominates the following members to form an Energy and Emissions Working Group:

- a.
- b.
- c.
- d.
- e.



Shire of Mundaring

Energy and Emissions Reduction Strategy 2018



*“Encourage **renewable energy** use by residents and businesses”*
*“Promote **sustainability in design and development** for buildings”*
MUNDARING 2026 STRATEGIC COMMUNITY PLAN

*“To establish a sustainable Shire that demonstrates our corporate and community commitment to the environment and reflects our responsibility to its natural assets for future generations. The Shire strives to be **a leader in local government sustainability** and environmental management”*
ENVIRONMENTAL MANAGEMENT PLAN 2012-2022

*“Promote a more **energy-efficient** form of development and disposition of land uses and transport systems, and to **minimise greenhouse gas emissions**”*
LOCAL PLANNING SCHEME NO. 4

*“Encourage transport, planning and building systems that **support low emissions** and accommodate a changed climate”*
LOCAL CLIMATE CHANGE ADAPTATION ACTION PLAN 2012

*“The Shire will pursue and promote improved water and **energy efficiency**, **reduced carbon emissions** and sustainable use of natural resources.”*
ENVIRONMENTAL SUSTAINABILITY POLICY 2018

Acknowledgements

The Energy and Emissions Reduction Strategy has been prepared by the Eastern Metropolitan Regional Council (EMRC) with assistance from the Shire of Mundaring. In particular, the EMRC would like to acknowledge the contribution of the Coordinator Environment and Sustainability, Service Managers and Officers within the Shire of Mundaring, and community members of the Shire's Environmental Advisory Committee and Mundaring in Transition (Energy and Emissions Working Group).

The Energy and Emissions Reduction Strategy remains the property of the Shire of Mundaring, as owner of the facilities, producer of emissions and consumer of energy.

Table of Contents

Executive Summary.....	6
Introduction.....	7
Strategic Framework	8
Strategic Community Plan	8
Environmental Management Plan 2012-2022.....	9
Local Planning Scheme 4.....	9
Environmental Sustainability Policy	9
Local Climate Change Adaptation Action Plan 2012	9
Regional Environment Strategy.....	10
Western Australian Local Government Association (WALGA).....	10
Background	11
Climate Change: the causes and impacts	11
What is Climate Change?.....	11
What are the causes of Climate Change?	11
How will Climate Change affect the region?	12
How will Climate Change affect the Shire?.....	12
Global Action	13
Paris Agreement.....	13
Sustainable Development Goals	13
Shire Emissions Reduction Target	13
Energy Future in WA	14
Energy Sources and Uses	14
The rising cost of Energy in WA	14
Framework.....	15
What is the Energy and Emissions Strategy?.....	15
What is the objective of the Strategy?	15
What steps are required to implement the Strategy?.....	16
Previous Energy Actions	16
Shire's 2017/2018 Review	17
MEASURE.....	18
Achieving Carbon Emissions Reduction Program	18
Emissions Boundary.....	18
Planet Footprint	19
Organisational Units	19
Scopes	20
Community Emissions Profile	21

Cities Power Partnership	21
Emissions Reduction Target.....	22
Energy and Emissions Reduction Plan	22
REDUCE	23
Avoid	23
Reduce	23
Replace	24
OFFSET	26
GreenPower	26
Carbon Neutrality	26
MONITOR & REPORT	27
Energy Team.....	27
Environmental Advisory Committee.....	27
Emissions Report Card.....	27
Management and Responsibilities	28
Who has Responsibilities under the Strategy?	28
Funding	28
Conclusion.....	29
Glossary	30
Acronyms	30
Definitions.....	31
Images.....	31
References	32

Document History

Version number	EAC Meeting Date	Council Meeting Date
1	28 August 2018	11 September 2018

Executive Summary

The Shire of Mundaring's Energy and Emissions Reduction Strategy supports strategic objectives relating to climate change, by setting a target and outlining a framework to achieve carbon emissions reduction.

An emissions reduction target to reduce corporate emissions by 30% by 2030 (from 2016/2017 levels) has been developed through consultation with staff and the Shire's Environmental Advisory Committee. This target is achievable even with new streetlights and facilities being added through subdivision and development, provided investments are made in renewable energy for Shire facilities as well as broader energy efficiency measures across Shire assets.

Reducing energy use will mitigate against rising energy costs as well as reducing carbon emissions to address climate change. The target set in this Energy and Emissions Reduction Strategy will be achieved through implementing an Energy and Emissions Reduction Plan which would include:

- analysing the Shire of Mundaring's core corporate carbon footprint (from electricity, gas and fuel);
- identifying efficiency opportunities for different facilities and service areas;
- development and implementation of appropriate actions to avoid, reduce or replace emissions intensive activities;
- offsetting a proportion of carbon emissions and/or purchasing GreenPower;
- ongoing monitoring and reporting (including State of Environment reports); and
- regular review to take into account changes in markets and technology, or state and federal energy and emissions reduction initiatives.

The Energy and Emissions Reduction Strategy and associated plan will support the Shire of Mundaring in targeting effort for energy efficiency and emissions reduction projects, and support grant and funding applications.

It is important to note that local governments alone cannot and should not be expected to manage emissions reduction to the extent necessary to avoid dangerous levels of climate change. Current international commitments are too low to avoid a global rise in temperature of over 2°C. To date there has been a concerning lack of direction from the State and Commonwealth Governments, and Australia's emissions are well above the levels required to meet the national target of 26-28% reduction by 2030 (from 2005 levels). Advocacy for effective leadership and action from the State and federal governments will therefore be a necessary component of the Energy and Emissions Reduction Strategy and associated action plan.

Introduction

The Shire of Mundaring is a peri-urban or semi-rural area, with residential townships located on the eastern fringe of Perth. The Shire covers a total land area of 644 km², of which nearly half is national park, state forest or water catchments. It is home to approximately 39,000 residents.

The diverse and varied landscapes, activities and communities of the Shire are at risk from the impacts of climate change. Climate modelling indicates that the south west of Western Australia, including the Shire of Mundaring, will continue to be affected by increased temperatures, more frequent bushfires, and reductions in rainfall, surface and groundwater resources.

The Shire has already taken some steps to reduce its contribution to climate change by installing solar panels and increasing energy efficiency. More substantial reductions in energy consumption and carbon emissions are essential to slow the rate of climate change, as part of the effort to keep the global temperature rise this century below 2°C.

This Strategy will continue the work undertaken in the past under the Shire's previous *Corporate Greenhouse Gas Action Plan*. A review of the Shire's actions to date was undertaken in 2017/2018

and the information gathered in the review is summarised within this Strategy and associated Energy and Emissions Reduction Plan.

This Energy and Emissions Reduction Strategy seeks to integrate with the Shire of Mundaring's existing strategies and plans, providing a framework for emissions reduction and energy efficiency which considers and links to objectives and actions identified in other strategic documents.

This will be delivered by implementing a framework which includes the establishment of a carbon footprint, identifying and setting targets, implementing energy and emissions reduction actions in an Energy and Emissions Reduction Plan, monitoring action progress against targets, and reviewing to ensure relevance and continual improvement.

The Energy and Emissions Reduction Strategy (EERS) and target will require review every four years to adapt to changing national policies and programs. The associated Energy and Emissions Reduction Plan (EERP) will be reviewed every two years, to more actively monitor progress, changes in technology, and new opportunities for actions against priority years.

Strategic Framework

The EERS sits beneath the *Mundaring 2026 Strategic Community Plan* and would integrate with a range of environmental plans and strategic documents (Figure 1).



Figure 1 – Concept diagram of strategic environmental plans

Mundaring 2026 Strategic Community Plan

The Strategic Community Plan sets the direction and identifies strategic themes to address over the next ten years.

The community's vision is:
'A sense of space, a sense of place'

The EERS would accord with the community value 'living sustainably' and the following priorities:

- A place where the environment is well managed
- A fiscally responsible Shire that prioritises spending appropriately
- Community needs are considered in planning for the future

The cover of the **Mundaring 2026 Strategic Community Plan** features the title in large blue letters, the vision statement *'a sense of space, a sense of place'* in red, and a scenic image of a rainbow over a lake with a red canoe.

Environmental Management Plan 2012-2022

The aim of the Shire's *Environmental Management Plan 2012 - 2022* is to guide the Shire's environmental management activities to 2022 where the vision statement is:

'To establish a sustainable Shire that demonstrates our corporate and community commitment to the environment and reflects our responsibility to its natural assets for future generations. The Shire strives to be a leader in local government sustainability and environmental management.'

Atmosphere and climate change is a key focus area in the Shire's Environmental Management Plan.

Local Planning Scheme No. 4

One of the main aims of the Shire's Local Planning Strategy and Local Planning Scheme No. 4 is to achieve ecological, social and economic sustainability through a land use planning framework that balances the benefits and impacts of development on the Shire's natural, built, social and economic environment.

An aim of Local Planning Scheme No. 4 relevant to the EERS is:

'To promote a more energy-efficient form of development and disposition of land uses and transport systems, and to minimise greenhouse gas emissions'.

Environmental Sustainability Policy

The Policy adopted in 2018 includes a number of policy statements relating to energy, emissions and climate change:

1.4. Human induced climate change is recognised as a key threat to biodiversity, requiring mitigation action to reduce carbon emissions at all levels of government, and adaptation to local impacts.

2.1 The Shire will pursue and promote improved water and energy efficiency, reduced carbon emissions and sustainable use of natural resources.

2.2 Energy and water efficiency is a key consideration in design, construction, maintenance or renovation of Shire facilities, and in the purchase of vehicles, machinery, fittings and appliances.

Local Climate Change Adaptation Action Plan 2012

The Shire has been participating in the Future Proofing Perth's Eastern Region – Adapting to Climate Change program since 2008. While the *Regional Climate Change Adaptation Action Plan* identified actions which benefit from a regional approach, the Shire of Mundaring's *Local Climate Change Adaption Action Plan (LCCAAP)* (2012), focuses on actions related to Council operations and services; and provides a risk management approach regarding the impact of climate change as well as to prepare and educate the community.

The Shire of Mundaring's Energy and Emissions Reduction Strategy and action plan will also align with strategic objectives at the regional level, and Western Australian local governments in calling for effective leadership and action on climate change.

Regional Environment Strategy

The Eastern Metropolitan Regional Council's (EMRC) *Regional Environment Strategy 2016-2020* progresses regional environmental management aligned with the United Nations Agenda 2030 Sustainable Development Goals (SDGs) framework.

The document outlines strategic objectives that relate to the Sustainable Development Goals and Perth's Eastern Region. The objectives relevant to the EERS include:

Strategic Objective 2: Our region adopts sustainable, affordable and modern energy sources and promotes energy efficiency.

Strategic Objective 4: Our region fosters sustainable consumption and production patterns and promotes sustainable lifestyles.

Strategic Objective 5: Our region addresses climate change and its impacts through mitigation and adaptation.

Western Australian Local Government Association (WALGA)

In July 2018 the WALGA State Council endorsed the updated Policy Statement on Climate Change. This policy statement acknowledges that there is a global climate emergency, and that:

- i) The science is clear: climate change is occurring and greenhouse gas emissions from human activities are the dominant cause.
- ii) Climate change threatens human societies and the Earth's ecosystems.
- iii) Urgent action is required to reduce emissions, and to adapt to the impacts from climate change that are now unavoidable.
- iv) A failure to adequately address this climate change emergency places an unacceptable burden on future generations.

The WALGA Policy Statement on Climate Change also calls for:

- i) Strong climate change action, leadership and coordination at all levels of government.
- ii) Effective and adequately funded Commonwealth and State Government climate change policies and programs.

Background

Climate Change: the causes and impacts

What is Climate Change?

Climate change is a change in the state of climate identified by changes in mean or variability of its properties over a long period of time, including changes in temperature, precipitation or wind patternsⁱ. Earth's climate has changed continually throughout history due to natural and human-induced causes; however drastic changes to global climate over the last two centuries have been scientifically linked to increasing greenhouse gas (GHG) emissions trapped in the atmosphere produced by human activities.



Climate change has been recognised as one of the most important issues that humans have ever faced. Without immediate and drastic action world-wide, global land-ocean temperatures are expected to increase causing severe impacts to human and natural systems around the worldⁱⁱ. In order to combat climate change, the Shire will need to contribute to reducing carbon emissions within its own operations and encourage the community to do the same.

What are the causes of Climate Change?

The enhanced level of GHGs currently in the atmosphere are predominately caused by human-induced activities such as the use of fossil fuels, agriculture, deforestation and much more.

There has been a significant increase in GHGs in the atmosphere since the start of the industrial revolution. Generally, increased GHGs impact global land-ocean average temperatures. In 2016, the Earth's average land-ocean temperature was at 0.99°C, compared to 1880 where the average was -0.19°Cⁱⁱⁱ. A 0.50°C

change in global land-ocean temperatures can have severe impacts on vulnerable ecosystems and human settlements. It is expected that by the end of the century, the global temperature change will exceed 1.5°C at the current rate of on-going emissions of GHG^{iv}.

The Shire's corporate activities emit GHG emissions and are contributing to the levels in the Earth's atmosphere. Key activities include the consumption of electricity from non-renewable sources, burning of fuels in fleet vehicles, and use of gas in facilities.







How will Climate Change affect the region?

Accelerating climate change poses risks to human settlements and natural ecosystems^v. The *Regional Climate Change Adaptation Action Plan* states:

'Adapting to a changing climate, particularly in south west WA, continues to represent the biggest challenge and opportunity faced by local governments now and into the future. Climate change is not just an environmental issue, it is also a social and economic issue that if not managed could result in devastating outcomes.'

Reducing emissions is a financial and risk management issue as well as environmental. In 2017 the Australian Prudential Regulation Authority (APRA) advised that 'removing support for fossil fuels is no longer just a green or environmental issue but a prudential issue, an issue of sound financial and risk management.'

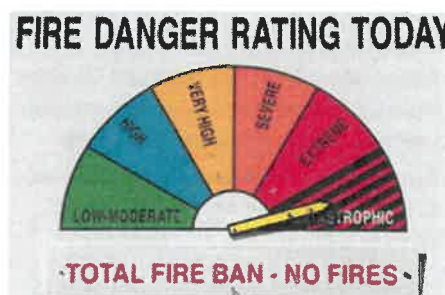
In the Swan Region, it is expected that in the near future (2020-2029) that^{vi}:

-  Mean annual temperatures will rise
-  The number of days above 35°C will increase
-  Winter rainfall will decrease
-  Severe weather events will increase
-  Soil moisture will decrease
-  Harsher fire-weather climate increasingly likely

How will Climate Change affect the Shire?

Some likely impacts to the Shire from climate change include health risks to vulnerable residents from more frequent and severe heatwaves, reduced streamflow and water availability, infrastructure damage from extreme weather events, loss of biodiversity and natural area degradation.

One of the most significant impacts for this area is increased bushfire risk. There are multiple climate change impacts (particularly lower soil moisture and increased heatwaves) that can combine to raise the number of days per year with severe, extreme and catastrophic fire danger ratings. In addition to the severity of bushfire, this will shorten the period when controlled burns can safely be conducted to reduce bushfire fuel loads.



While the Shire will not be directly affected by some impacts of climate change such as rising sea levels, it will still be indirectly affected by the diversion of State Government funding to address loss of property and infrastructure along the coast, and broad increases in insurance costs.

Global Action

Paris Agreement

In August 2015, Australia ratified the Paris Agreement, a global climate agreement agreed under the United Nations Framework Convention on Climate Change with the main aim of keeping global average temperature rise well below 2°C. The Agreement brings nations around the world together to combat climate change through 'nationally determined contributions' (NDC). The Paris Agreement entered into force on 4 November 2016^{vii}.

As part of the Australian Government's NDC, Australia has pledged to reduce carbon emissions by 26-28% on 2005 levels by 2030^{viii}. The 2018 Western Australian Local Government Association (WALGA) Climate Change Policy Statement notes that Australian and international targets under the Paris Agreement are too low to avoid at least a 2°C rise and catastrophic climate change and and calls for:

- i) the Commonwealth Government to show international leadership, by committing to a more ambitious target;
- ii) Strong climate change action, leadership and coordination at all levels of government; and
- iii) Effective and adequately funded Commonwealth and State Government climate change policies and programs.



Sustainable Development Goals

Also in 2015, countries worldwide adopted a set of goals to 'end poverty, protect the planet and ensure prosperity for all' as part of a new sustainable development agenda, Agenda 2030. 17 SDGs were adopted at an historic UN Summit that will mobilise global efforts to, among other things, tackle climate change^{ix}.

The EMRC and its member councils, including the Shire, were one of the first organisations in Australia to progress regional environmental management under the SDG framework.

The EMRC's *Regional Environmental Strategy 2016-2020* used the SDGs to contribute to strategic objectives. The EERS closely relates to SDG 7 Affordable and Clean Energy, and SDG 11 Sustainable Cities and Communities.

Shire Emissions Reduction Target

The Shire's new 30% Emissions Reduction Target notionally reflects the Australian Government's NDC, but from a 2016/2017 baseline. The 2005 data was not available, and using the most recent complete set of energy data gives a clear direction to reduce emissions 30% from current levels.

Energy Future in WA

Energy Sources and Uses

Energy is necessary to operate vehicles, machinery, air conditioners, office equipment and a range of facilities and is important to the everyday functioning of the Shire and its residents. This EERS focusses on the energy used by the Shire in providing services and facilities, as the emissions are 'owned' and the energy costs are effectively shared by all ratepayers.

'Renewable energy' refers to sources such as solar panels, wind turbines, wave energy or geothermal energy. These sources convert the power of the sun, wind and waves into electricity which can be used on site or stored in batteries. Geothermal energy for heating or cooling makes use of the change in temperature between the land surface (which fluctuates through days and seasons) and underground, which stays more consistent.

'Fossil fuels' are sources of energy including coal, oil (including petrol and diesel), and natural gas that contain condensed energy from the past. They take a very long time to form and all fossil fuels are being used at a rate far faster than they form. Burning fossil fuels (or timber or other materials) for energy releases the stored carbon along with the stored energy.

Burning fossil fuels for energy is not the only source of carbon emissions, but electricity, gas and vehicle fuel represent the majority and the most measurable of emissions sources from Shire activities. This EERS does not take into account emissions from food production and distribution, embodied energy in consumables and building infrastructure, or clearing or planting of vegetation.

The rising cost of Energy in WA

Australia has some of the most expensive power in the world and Western Australia's electricity network (known as the South West Interconnected System) is on the cusp of an energy revolution with the emergence of 'disruptive' technologies such as renewables and storage.

Although Perth's utility costs have remained below other states and territories, electricity prices almost doubled between 2008 and 2014 and continue to rise. This has been caused by rapid population growth, investment in network infrastructure, increasing maintenance costs, and the surge of household rooftop solar which led to significant changes to peak demand and occasional excess capacity in the system.^x

Rising energy costs can be mitigated against with the use of energy efficient technology, changes to behaviour, and renewable energy.

Framework

The Shire of Mundaring has already made a commitment to “Reduce the greenhouse gas emissions resulting from Shire’s operations and activities”, in its *Environmental Management Plan 2012 – 2022*.

Setting a target through the EERS will help focus operational, strategic and policy decisions towards reducing carbon emissions from Shire activities.

What is the Energy and Emissions Strategy?

The EERS provides a framework to reduce the energy consumption and carbon emissions produced by the Shire. In setting a target for emissions reduction the Shire is committing to ongoing action until 2030, but with reviews along the way.

It would be possible to pay to offset all of the Shire’s carbon emissions, and in the future this might be necessary. This strategy uses the principle that Shire funds and staff time should first be directed to efficiency measures and increasing renewable energy, which have ongoing emissions reduction and cost saving benefits.

Emissions management is not a static process. As the implementation of avoidance and reduction actions increases, the cost to offset the Shire’s remaining emissions should decrease.



What is the objective of the Strategy?

The primary objective of the EERS is to drive the organisation towards effectively reducing energy use along with carbon emissions, thereby meeting its strategic climate change and environmental management objectives.

Effective measures including solar panels on Shire facilities and fuel and energy efficiency measures will also provide a financial buffer from rising energy prices, which could otherwise contribute to future rate rises.

What steps are required to implement the Strategy?

The principles that the Shire will follow to reduce its overall emissions are:

1. Reduce energy requirements by implementing efficiency measures and purchasing more efficient items and vehicles;
2. Directly increase use of renewable energy by installing Photovoltaic (PV) systems at suitable Shire facilities;
3. Reduce or offset some emissions by purchasing decisions, such as GreenPower or accredited carbon offsets.

Implementation of the EERS will involve:

- Measuring a carbon footprint for all Shire operated facilities;
- Identifying cost effective opportunities to reduce emissions;
- Reducing energy or fuel usage at all Shire operated facilities by implementing identified emissions reduction and management actions;
- Purchasing accredited carbon offsets;
- Monitoring and reporting of progress (including State of Environment Report); and
- Reviewing opportunities and actions regularly.

Previous Energy Actions

The review identified the following emissions reduction achievements within the Shire:

- Installation of Solar Photovoltaic (PV) Systems at Shire Depot, Swan View Youth Centre and Administration and Civic Centre;
- Solar pool heating and energy efficient pumps installed at Bilgoman Pool
- Energy audits conducted on Shire Depot and Bilgoman Pool
- Smart lighting at Shire Administration and Civic Centre, and Shire Depot
- Solar hot water system installed at Shire Depot
- Tracking corporate carbon emissions via Planet Footprint
- Involvement in the Cities for Climate Protection (CCP) Program from 2001-2009
- Participation in EMRC's Achieving Carbon Emissions Reduction Program since 2009
- Living Smart courses for residents (as part of Perth Solar City Program 2010-2012)
- Home Energy Audit Kits and powermates available in Shire Libraries for residents

REVIEW

Regular review of actions and achievements is essential to ensure the Shire is making the most of new practices and new technologies as they emerge over time, as well as ensuring that objectives remain relevant and achievable.

Reviewing and updating actions to take into account successful (and unsuccessful) outcomes will ensure priority is given to the most transformative actions to keep progress towards the target on track.

Shire's 2017/2018 Review

The Shire began a review process of its energy efficiency and emissions reduction achievements in 2017. A desktop study identified the current status of emissions reduction actions within the Shire based on the *Environmental Management Plan 2012-2022* and reviewed relevant strategies and actions within the Shire's plans and policies.

These included:

- Environmental Management Plan 2012-2022
- Mundaring 2026 Strategic Community Plan
- Corporate Business Plan 2017/2018 – 2020/2021
- State of the Environment Report 2008
- Draft Carbon Reduction Strategy 2014
- Procurement Policy
- Corporate Greenhouse Action Plan 2001
- EMRC Regional Environment Strategy 2016-2020

The desktop study identified emissions reduction achievements and recommended actions following research into emerging technologies and trends that could aid the Shire in achieving the new target. The majority of the information gathered in the desktop study is summarised within this Strategy and the EERP 2018-2023.



MEASURE

The Shire's emissions are measured in tonnes of carbon dioxide equivalent (tCO₂-e) and a 'carbon footprint' is a measure of the emissions attributable to an individual, household, organisation, event or product.

The Shire is provided with a report on its corporate emissions annually through its participation in the EMRC's Achieving Carbon Emissions Reduction Program (see Monitor and Report).

Achieving Carbon Emissions Reduction Program

The Achieving Carbon Emissions Reduction Program (ACER) was developed in 2009 by the EMRC in collaboration with its six member councils, Town of Bassendean, City of Bayswater, City of Belmont, City of Kalamunda, Shire of Mundaring and the City of Swan, following the defunding of CCP. The Shire of Mundaring has participated in the ACER program since its inception in 2009.

A key element of ACER is the ongoing measurement of carbon emissions. This is provided currently by the Planet Footprint data management platform; an online software platform which enables participating councils to track and report their energy and water consumption as well as corporate carbon emissions. It is suitable for reporting under the National Greenhouse and Energy Reporting Act (NGER), the National Carbon Offset Standard (NCOS) and the Greenhouse Gas Protocol (ISO14061.1).

Emissions Boundary

Sources of corporate emissions vary and for the purpose of calculating a carbon footprint an emissions boundary has been set. This must include major sources of emissions and be sufficient to plan reduction actions, but will not include all sources.

Defining an emissions boundary is the first step in calculating a carbon footprint. The boundary, as defined by the National Carbon Offset Standards for Organisations, refers to the coverage and extent of the Shire's carbon footprint using a set of criteria (scopes) to identify emissions sources and decide which sources are relevant and which are not, with justification.

The Shire's emissions boundary is defined as a control approach in which the Shire accounts for the carbon emissions from operations that it has full authority to introduce and influence (such as electricity use in buildings, fuel use and bottled gas). The Shire's full emissions boundary is to be included in the EERP.

Planet Footprint








Planet Footprint collects, displays and interprets the Shire's invoiced data from electricity, gas and water utilities. It provides a user friendly web-based platform for the Shire staff to use and analyse for its monitoring and reporting requirements (see Monitor and Report). The Shire pays an annual subscription for Planet Footprint monitoring, and EMRC staff assist with updating and analysing the data as part of the ACER program.

Planet Footprint also calculates the Shire's total carbon emissions and energy costs. A detailed analysis of the Shire's corporate emissions is provided to the Shire annually based on the data provided in Planet Footprint. This data is also used for the Shire's Emissions Reduction Target baseline carbon footprint and will aid in tracking progress towards that target.

Organisational Units

Within the Planet Footprint platform, the Shire's assets are grouped into organisational units. These units are used to identify where the Shire's highest energy using and carbon emissions are occurring and which departments are involved in the management of those assets/units.

The Shire's organisational units include:

-  Street Lighting
-  Fleet
-  Sports and Recreation
-  Administration
-  Halls and Community Facilities
-  Parks and Gardens
-  Auxiliary Lighting

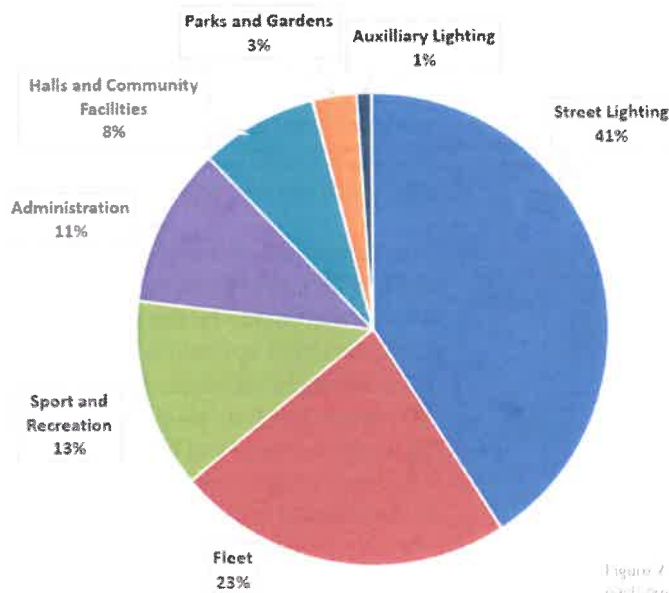


Figure 7 – Contribution to Shire emissions from each organisational unit

Scopes

Carbon footprint calculation principles are set out in the Greenhouse Gas (GHG) Protocol and adopted under the National Greenhouse and Energy Reporting System (NGERS). These principles include relevance, completeness, consistency, transparency and accuracy.

These principles are also consistent with those outlined under the other relevant Australian and international standards, including ISO 14064 and ISO 14040 series. Under the standards, emissions are divided into three scopes:

Scope 1 emissions are the direct emissions from facilities controlled by the council, including emissions released from the use of council vehicles;

Scope 2 emissions are the indirect emissions from the generation of electricity which is purchased by the council but produced at a facility outside of the organisational boundary of the council, for example the purchase of electricity from the grid; and

Scope 3 emissions are all other indirect emissions that arise from activities undertaken by the council but are not from facilities under the control of the council - such as streetlights. Almost all street lighting infrastructure across the south-west of Western Australia is owned by Western Power, which has been slow to adopt energy efficient lighting such as LEDs. Streetlights are the Shire's largest source of corporate emissions, with a power bill of \$600,000 per year.

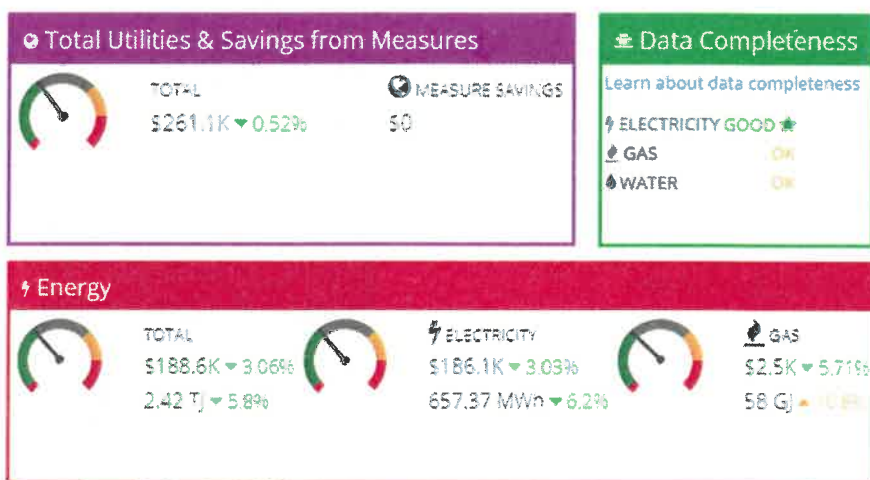


Figure 3 Dashboard display of the Shire's energy data within the Planet Footprint Platform

Community Emissions Profile

Measuring the Shire's total community emissions is very difficult due to the range of emissions from residents and businesses with limited data available to the Shire. This would include the vehicles that residents drive, energy use within homes and businesses, amount of waste to landfill and a range of other emissions sources.

The Shire currently sources some community emissions data from Ironbark Sustainability. More accurate local community emissions data could be obtained at a cost.

Community emissions profiling may become more available with assistance from the State or Commonwealth Governments. Opportunities will be investigated but currently the Shire does not have enough reliable data to determine a community emissions reduction target.

Without accurate community emissions measurements or targets the Shire can still support community initiatives, or undertake its own actions, to raise awareness of the urgent need to act on climate change. This can prompt voluntary changes to reduce emissions from local residents, schools and businesses.

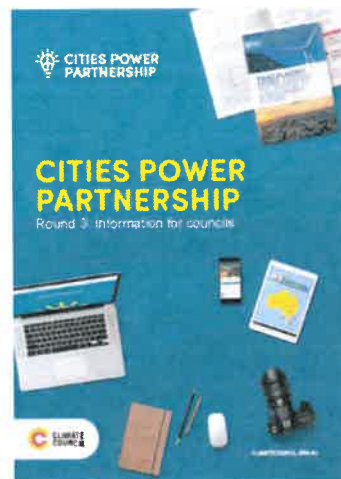
However the focus of this Strategy is on reducing the Shire's corporate emissions, for which the Shire has the most direct control and responsibility, and where future energy cost savings will be shared by all ratepayers.

Cities Power Partnership

The Climate Council's Cities Power Partnership (CPP) was established to connect, support and motivate local governments reducing emissions.

Joining the CPP is free, and would connect the Shire to a national network of local governments working towards emissions reduction. Within six months of joining the CPP the Shire would be required to choose and commit to progress on five actions from the Partnership Action Pledge list.

The options for the round three (2018) intake include 38 possible actions under the headings of renewable energy, energy efficiency, sustainable transport and advocacy (work together and influence). Some actions relate directly to corporate emissions, but many will require the Shire to assist in reducing emissions within the community, such as 'support local community energy groups with their community energy initiatives'.



PLAN

The Shire needs to set an achievable emissions reduction target. During the Shire's 2017/2018 review, staff were consulted on the Strategy's new Emissions Reduction Target as well as action planning to reduce energy use and emissions.

The Shire's Emissions Reduction Target is:

“To reduce corporate emissions by 30% by 2030, from 2016/2017 levels”

Emissions Reduction Target

The Shire's Emissions Reduction Target was developed to challenge the Shire to reduce carbon emissions within its corporate activities. A clear Emissions Reduction Target aids the Shire in tracking progress, and Shire leadership can help promote local community emissions reduction.

A baseline year was set using recent emissions data (2016/2017) and potential actions to achieve the new target were discussed amongst staff during the 2017/2018 review.

The 2017/2018 review process identified 30% as an achievable target for the Shire based on current corporate emissions and reduction potential (with current technology).

A higher target would be possible with increased purchasing of carbon offsets, or rapid technological change.

Energy and Emissions Reduction Plan

Details on how the Shire's plans to achieve its new target will be outlined in the EERP. The Plan implements the EERS with actions that work towards achieving the objectives and targets.

The EERP will include current information on corporate carbon emissions for the target baseline year, energy information, relevant technical details and actions.

Actions will be based on the Shire's current priorities, new technologies and trends that are relevant to the Shire. The implementation of each action is the responsibility of its associated responsible service area or position.

As technology and opportunities will change rapidly the implementation of the plan will require flexibility, and the plan itself will require regular review.

REDUCE

Actions identified under the Energy and Emissions Action Plan will be assigned timelines, budget types, and estimated costs, savings and emissions reduction potential to ensure successful outcomes. Actions will normally fall into one of three categories: avoid; reduce; or replace.

Avoid

The first principle is that the Shire should avoid carbon intensive actions where it can. These changes are the most transformative in terms of downsizing the Shire's overall carbon footprint. As the Clean Energy Finance Corporation (CEFC) states:

'Designing, constructing and refurbishing for efficient buildings today will avoid locking in emissions and energy intensive assets for many decades. Direct carbon emissions can be avoided by implementing sustainable design and education.'

Sustainable Building Design

Sustainable design can influence the heating and cooling needs of a new or existing building using smart design and materials. This may include window tinting, light colour roofing and wall products, external shading, urban greening (e.g. green walls/roofs), window treatments, ceiling fans, insulation, ventilation, and building orientation. Incorporating sustainable design principles into tenders and plans can aid in avoiding future carbon emissions.

Reduce

This principle is 'Whatever you can't avoid, do more efficiently'. There are various options to reduce energy usage and carbon emissions within council operated facilities.

Smart and Efficient Appliances

Smart appliances can provide energy efficient solutions to the Shire's buildings and also help to understand the building's energy usage. In the current digital age, technology is now connecting users to their appliances through apps on smart phones, smart watches, etc. Controlling the level of light within a room, the amount of ventilation and heating could be an opportunity for the Shire to upgrade inefficient appliances and reduce energy consumption through enhanced control of appliance operations.

The Shire can prioritise sustainable procurement of energy efficient (star rated) products when buying new equipment. This ensures high efficiency and low emissions, often with lower operating costs.

Education

Staff and community education can also positively influence emissions and energy usage within the Shire's buildings, community facilities and use of fleet assets. The Shire can encourage behaviour change towards energy efficiency, carpooling, active transport, and waterwise irrigation practices.

Replace

Replace high carbon-intensive energy sources with alternative sources. Switching to a supplier of accredited renewable energy minimises carbon emissions from electricity consumption and sends a clear signal to the energy market to invest in clean energy, assisting in the transition to a low carbon future.

Renewable Energy

Renewable energy is now the cheapest type of power generation to build in Australia and solar PV system costs continue to fall sharply. WA has the third largest percentage of dwellings with PV installations in Australia (25.1%), following Queensland and South Australia. Within the Shire, over 30.4% of the Shire's dwellings have solar installed on their rooftops and a total installed capacity of 14,674kW^{xii}. The next generation of renewable energy technology is now available in Australia for the Shire to implement as they work towards a new target.

Solar batteries store unused solar energy and provide an opportunity to extend the potential of the Shire's current solar capacity and use. The industry is rapidly expanding and is at a similar stage to where rooftop solar panels were a decade ago. The potential of solar batteries is growing and is expected to play an important role in Western Australia's future

energy system. The Shire will need to identify assets that would best benefit from solar batteries as costs fall over time, but also investigate limitations in use in bushfire prone areas.

Other opportunities in renewable energy include:

- Large scale solar and wind investment;
- Solar lighting;
- Microgrids; and
- Electric vehicles.



Electric Vehicles

A movement is underway where governments worldwide, such as France, India and Norway, are phasing out the sale of new diesel and petrol light vehicles and instead encouraging electric vehicle (EV) sales.

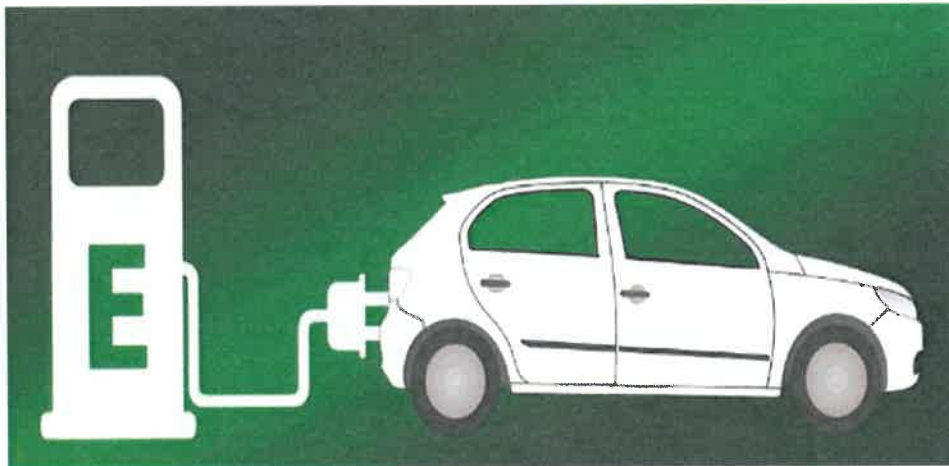
In Australia (excluding the ACT), there are currently no incentives for local governments to purchase EVs, however, the Australian Government is proposing new fuel efficiency standards, tighter noxious emissions standards, and improved fuel quality standards^{xiii}. This will in turn affect the sale of high polluting diesel and petrol vehicles.

Due to the current cost, lack of charging infrastructure and range anxiety, the EV market in Australia remains underdeveloped and there are currently few models in Australia available under \$50,000^{xiv}. Uptake within Western Australia has been even slower, where the average vehicle age (fleet) is older.

A substantial proportion of the emissions from the Shire's fleet is from trucks and heavy machinery, where electric vehicle options are limited. Advances are being made in hybrid trucks and machinery, and hydrogen fuels. However, changes towards hybrid vehicles within the light vehicle fleet (utilities and passenger vehicles) are more likely to be cost effective in the short term compared to the heavy vehicle fleet.

An electric light vehicle fleet for the Shire could reduce fleet emissions significantly if charged by 100% renewable energy. Whether this would be cost effective would depend on the initial price and resale value of electric vehicles, as well as the electricity source.

The Shire can advocate for state or national EV incentives such as support for public charging stations, price subsidies and tax breaks to increase the viability of electric vehicle fleets.



OFFSET

Offsetting residual emissions that cannot be reduced via the methods mentioned above is a legitimate means of reducing the net impact of energy use, provided that offsets form part of a broader carbon management strategy and derive from verified projects that create actual emissions reductions. This option should be an alternative or 'last resort' after completing actions to avoid, reduce and replace when achieving an emissions reduction target.

GreenPower

Currently, 90% of electricity in Australia is generated by fossil fuels; GreenPower is a way to ensure that electricity is generated from certified renewable energy. GreenPower is a product accredited under the National GreenPower Accreditation Program which enables purchase of renewable energy from a service provider, usually through renewable energy certificates. This gives the Shire the option to choose where its energy comes from and can reduce the Shire's carbon footprint. There are a number of GreenPower suppliers now operating in the SWIS.



Carbon Neutrality

Carbon neutral is achieving net zero emissions associated with an entity or activity for a defined duration^{xv}. After implementing avoid, reduce and replace actions, carbon neutrality can currently be achieved by offsetting any residual calculated emissions and achieving verification. There are additional paths to achieving carbon neutrality including advocacy to state and federal governments for large-scale renewable energy generation across the grid and supporting a decentralised energy network, including microgrids.

Microgrids are small electricity sub-grids with the ability to work with the main grid or in isolation. Microgrids can provide resilience during times of energy shortage (black outs) and aid in moving away from WA's current centralised model.

Microgrids may provide an opportunity for precincts to move towards zero emissions through battery storage in combination with trading systems for renewable energy (such as those using blockchain). Microgrids could benefit Shire buildings that have low roof or battery space, as well as provide the opportunity for energy trading^{xvi}.

MONITOR & REPORT

Regular monitoring of progress towards emissions reduction objectives will ensure that the aim of the EERS is being achieved and the actions outlined in the EERP are being progressed. Monitoring of implementation of actions and initiatives will maintain their relevance and ensure successful outcomes.

It is best practice for an organisation to publish information about the steps taken to measure, reduce and offset their emissions. This raises awareness in the community and shows leadership in the area of climate change mitigation.

Energy Team

The implementation of the EERS and EERP requires inter-departmental strategic oversight to ensure the best outcomes for Shire.

This will be provided through the participation of staff from different departments in an Energy Team. Regular meetings will maintain commitment to the objectives of the Strategy and share progress on actions under the Plan as well as maintain communication channels.

Environmental Advisory Committee

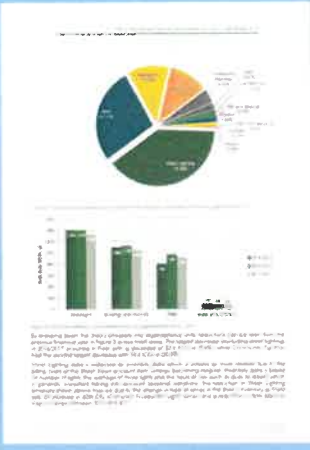
The Environmental Advisory Committee (EAC) can assist in recommending priority actions for implementation from the EERP, and be involved in regular monitoring and review of the EERS and EERP.

The Energy Team will need to communicate with the EAC about potential action implementation and the EAC will need to communicate identified priorities to Council for action funding and support.

Emissions Report Card

The Shire is provided with a report on its carbon footprint annually via participation in the ACER program. The Emissions Report Card provides a detailed summary on total corporate emissions (electricity, gas and fuel). It can also monitor how the Shire is tracking towards its emissions reduction target.

The report card is the main source of regular reporting to staff and can also be used to provide information to EAC and the community.



Management and Responsibilities

Who has Responsibilities under the Strategy?

The Shire of Mundaring's Council has the responsibility of endorsing the EERS and ensuring that appropriate approvals, particularly budgetary, are given when appropriate to ensure that implementation of actions can be undertaken in a timely manner.

Shire staff have the responsibility of establishing and maintaining inter-departmental coordination to ensure the best outcomes for Shire, including participating in the Energy Team meetings.

The Co-ordinator Environment and Sustainability has the responsibility of providing direction and management of the Strategy's implementation, as well as coordination of data collection, monitoring and review. They will also oversee reporting of progress and maintain communication channels.

Responsibility for implementation of actions and initiatives will be allocated to specific departments and/or positions within the Shire of Mundaring and the EMRC as appropriate. Although certain activities may involve consultants or contractors, responsibility for actions cannot be assigned to an external agency or contractor.

Departments and individuals as users and occupiers of Shire of Mundaring operated facilities have a responsibility to ensure energy is used as efficiently as their knowledge base allows.

Funding

The actions under the EERP will be required to be financially sustainable. Funding may be provided by:

- Time committed under ACER program (EMRC);
- Internal budget commitment to developing and implementing the EERP and projects through the EMRC's ACER program;
- Internal budget commitment to capital expenditure relating to emissions reduction actions, either separately or through individual departmental budgets;
- Grant and funding opportunities;
- Allocating identified cost savings from previously implemented actions to future actions within the internal budgetary process;
- Partnership or sponsorship arrangements with external organisations such as technology providers;
- Loans (such as CEFC); and
- In-kind contributions by Shire staff.

Conclusion

The Shire of Mundaring's EERS has been developed to address the urgent issue of global climate change, and will complement the Shire's existing strategies and plans by outlining a framework for better energy management and carbon emissions reduction.

The EERS specifically follows on from the Shire of Mundaring's past actions under its *Corporate Greenhouse Gas Action Plan (2000)* and considers and links to objectives and actions identified in other key policy documents, such as the *Mundaring 2026 Strategic Community Plan* and *Local Climate Change Adaptation Action Plan*.

The EERS should drive the organisation towards effectively managing energy use along with carbon emissions, and provide local leadership on tackling climate change. While the Shire has direct responsibility and greater control over emissions generated through its facilities and activities, there is a far greater volume of emissions generated by local households, businesses and transport within the Shire boundaries. It is important for the Shire to 'have its own house in order' and lead by example, as well as supporting community and business initiatives to improve energy efficiency and reduce emissions throughout the Shire.

The EERS will support the Shire of Mundaring's achievement of strategic objectives in relation to protecting the natural environment and addressing climate change, aid in the development of future environment plans, assist with the development of energy efficiency and carbon emissions reduction projects, and support grant and funding opportunities.

The delivery of the EERS and EERP will be through an ongoing process of measurement, planning, implementation, monitoring and review to ensure successful outcomes and continual improvement.

The EERS should be reviewed every four years to ensure the Shire is on track to achieving its target and objectives, as well as adapting to changes in national policies and programs.

The EERP should be reviewed every two years to ensure actions are progressing and remain relevant with changes in policy and technology.



Glossary

Acronyms

ACER – Achieving Carbon Emissions
Reduction

CEFC - Clean Energy Finance Corporation

CPP – Cities Power Partnership

EERP – Energy and Emissions Reduction Plan
(2018-2023)

EERS - Energy and Emissions Reduction
Strategy (2018)

EMRC – Eastern Metropolitan Regional Council

EV – Electric Vehicles

LED – Light-emitting Diode

NCOS – National Carbon Offset Standard

NDC – National determined contributions

NGERS – National Greenhouse and Energy
Reporting Scheme

NRM – Natural Resource Management

SDGs - Sustainable Development Goals

Solar PV - Solar photovoltaic

tCO₂-e – Tonnes of carbon dioxide equivalent

WALGA – Western Australian Local
Government Authority

Definitions

Climate Change – A change in the state of the climate that can be identified (e.g. by statistical tests) by changes in the mean and/or variability of its properties and that persist for an extended period of time, typically decades or longer^{xvii}.

Baseline Year - defined under NGERs as 'the reference point against which future emissions performance will be measured'

Mitigating – A human intervention to reduce the sources or enhance the sinks of greenhouse gases^{xviii}

Sustainable/ Sustainability – Maintaining healthy environmental, social and economic systems in balance, indefinitely, on a global and local scale^{xix}.

Carbon Emissions / Greenhouse Gas (GHG) Emissions – emissions caused by human and natural activities. Carbon emissions consist of carbon dioxide, methane, nitrous oxide and fluorinated gases.

Carbon Footprint – the total measurement of carbon emissions of a defined period of time, population or activity.

South West Interconnected System (SWIS) - The electricity network in the south west corner of Western Australia which comprises of all electricity generators and Western Power.

Images

- Cover Page – Shire of Mundaring administration building
- Page 9 – Strategic Community Plan Cover Page
- Page 12 – Bushfire
- Page 13 – Fire Danger Rating sign
- Page 14 – SDG wheel (United Nations)
- Page 16 – Framework diagram (EMRC)
- Page 18 – Solar Panels on roof of Administration Building
- Page 20 – Emissions sources chart (Shire of Mundaring)
- Page 21 – Planet Footprint dashboard display
- Page 22 – Cities Power Partnership – Cover of Round 3 guide for councils
- Page 25 – Solar array
- Page 26 – Electric vehicle charging
- Page 27 – Windmills (CC0)
- Page 28 – Emissions Report Card (EMRC)
- Page 30 – Air-conditioner remote and unit (EMRC)

References

- ⁱ Climate Council. (2014). *How well do you know your climate change ABCs?*. Retrieved from <https://www.climatecouncil.org.au/climate-change-basics> (26/03/2018)
- Climate Council. (2018). *Cities Power Partnership Round 3: Information for Councils*. Retrieved from <http://citiespowerpartnership.org.au/what-is-the-partnership/> (10 July 2018)
- ⁱⁱ CSIRO. (2016). *State of the Climate 2016*. Retrieved from <https://www.csiro.au/en/Research/OandA/Areas/Assessing-our-climate/State-of-the-Climate-2017> (26/03/2018)
- ⁱⁱⁱ NASA. (2018). *Global Climate Change: Global Temperature*. Retrieved from <https://climate.nasa.gov/vital-signs/global-temperature/> (26/03/2018)
- ^{iv} United Nations Sustainable Development. (2018). *Goal 13: Take urgent action to combat climate change and its impacts*. Retrieved from <http://www.un.org/sustainabledevelopment/climate-change-2/> (26/03/2018)
- ^v Department of the Environment and Energy. (2018). *Understanding climate change*. Commonwealth of Australia. Retrieved from <http://www.environment.gov.au/climate-change/climate-science-data/climate-science/understanding-climate-change> (26/03/2018)
- ^{vi} Perth NRM. (2018). *Planning for Climate Change: The Swan Region – a summative report on projections and adaptive responses on climate change impacts within the Swan Region*. Australian Government.
- ^{vii} UNFCCC. (2017). *The Paris Agreement*. Retrieved from http://unfccc.int/paris_agreement/items/9485.php (26/03/2018)
- ^{viii} Department of the Environment and Energy. (2017). *Paris Agreement*. Retrieved from <http://www.environment.gov.au/climate-change/government/international/paris-agreement> (26/03/2018)
- ^{ix} United Nations. (2017). *The Sustainable Development Agenda*. Retrieved from <http://www.un.org/sustainabledevelopment/development-agenda/> (26/03/2018)
- ^x Bankwest Curtin Economics Centre. (2017). *Power to the People: WA's Energy Future*. Curtin University.
- ^{xi} Department of the Environment and Energy. (2017). *National Carbon Offset for Organisations*. Retrieved from <http://www.environment.gov.au/climate-change/government/carbon-neutral/ncos/organisations> (09/02/2018)
- ^{xii} Australian Photovoltaic Institute. (2018). *Australian PV Institute (APVI) Solar Map*. Australian Renewable Energy Agency. Sourced via <http://pv-map.apvi.org.au/historical#11/-31.9230/116.1742> (26/03/2018)

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- ^{xiii} Department of the Environment and Energy. (2016). *Better fuel for cleaner air: Discussion Paper*. Retrieved from <http://www.environment.gov.au/protection/fuel-quality/better-fuel-cleaner-air-discussion-paper-2016> (23/02/2018)
- ^{xiv} The Australia Institute. (2017). *If you build it, they will charge: Sparking Australia's electric vehicle boom*. Retrieved from <http://www.tai.org.au/sites/default/files/P233%20If%20you%20build%20it%20they%20will%20charge%20FINAL%20-%20October%202017.pdf> (23/02/2018)
- ^{xv} The Carbon Neutral Company. (2017). *The Carbon Neutral Protocol: The global standard for carbon neutral programmes*. Retrieved from <https://assets.naturalcapitalpartners.com/downloads/The-CarbonNeutral-Protocol-Jan2017.pdf> (20/03/2018)
- ^{xvi} Clean Energy Council. (2017). *Clean Energy Australia Report 2016*. Retrieved from <https://www.cleanenergycouncil.org.au/policy-advocacy/reports/clean-energy-australia-report.html> (09/02/2018)
- ^{xvii} CSIRO. (2016). *Climate Change in Australia: Glossary*. Australian Government. Retrieved from <https://www.climatechangeinaustralia.gov.au/en/support-and-guidance/glossary/#S> (20/03/2018)
- ^{xviii} UNFCCC. (2018). *Essential Background: Glossary*. Retrieved from http://unfccc.int/essential_background/glossary/items/3666.php (20/03/2018)
- ^{xix} James Cook University. (2018). *What is Sustainability*. Retrieved from <https://www.jcu.edu.au/tropeco-sustainability-in-action/about/what-is-sustainability> (20/03/2018)

7.0 URGENT BUSINESS (LATE REPORTS)

8.0 CLOSING PROCEDURES

8.1 Date, Time and Place of the Next Meeting

15th June 2022, 6:00pm, Committee Room Shire of Mundaring

8.2 Closure of the Meeting