



Sustainable Bundaberg 2030



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Executive Summary



Council's energy transition strategy - Clean Energy Bundaberg 2014 - laid the ground work for transitioning Council towards a more cost effective, resilient and environmentally conscious future. Council's existing Clean Energy Bundaberg Strategy sets forth the goals and vision for a sustainable region, with a particular focus on delivering tangible benefits that include reduced operational costs, positive environmental outcomes and innovative opportunities for business and industry.

Included within this strategy is a roadmap to achieve the following outcomes:

- Implement clean energy policies that reduce Council's overall energy consumption and related operational costs
- Provide leadership that raises consciousness around clean energy adoption
- Transition from non-renewable energy sources towards clean technologies
- Support economic diversification through carefully planned energy investment
- Understand our environmental impact and use our knowledge to make environmentally consciousness decisions to preserve our natural resources.

Based on the full implementation of the action plan, Council's interim target is a reduction of 10% of its annual corporate carbon emissions by 2025/26 based on 2016/17 levels.

To align with national and international targets, Council will strive to reduce its annual corporate carbon emissions by 38% by 2030/31 based on 2016/17 levels.

To date, Council has achieved a number of positive outcomes in relation to clean energy initiatives. Notably, the projects and initiatives undertaken below have spanned across the entire organisation and involve various technologies and solutions that support the overarching Clean Energy Bundaberg Strategy. These include:

- Installation of solar PV systems (430 kW commissioned, and 800 kW planned)
- Bundaberg Regional Airport energy improvements
- Cedars Road and University Drive landfill gas flares
- Planting of nearly 90,000 trees within the Barolin Nature Reserve
- Implementation of energy efficiency projects under the Australian Government's Community Energy Efficiency Program (CEEP)
- Installation of a commercial-scale battery backup system (in conjunction with solar PV) on the Bundaberg Multiplex
- Inaugural member of the Cities Power Partnership
- Deployment of electric vehicle charging stations as part of the Queensland Electric Super Highway



Local sugarcane crop growing in red soil

The Sustainable Bundaberg 2030 strategy builds upon the work and successes of Clean Energy Bundaberg 2014. Of note, the Sustainable Bundaberg 2030 strategy includes three components. In order to help better target the efforts of Council, and to facilitate the different internal and external stakeholders to take agency over the initiatives identified within this strategy, three separate streams have been established. These streams address different aspects of the sustainability strategy and will move in parallel:

Stream 1: Business optimisation

This stream focuses on the initiatives taken internally within Council and cover the range of different actions to improve energy efficiency and utility usage. The activity in this stream will be administered directly by the different Council departments, and identifies department-specific actions and targets, with the Strategic Projects team providing oversight. The budget for this stream will largely fall within the operational budgets of the various departments or will be subject to the standard PDF review framework.

Stream 2: Flagship projects

This stream seeks to implement Council-wide or highly aspirational projects. This stream will be overseen by the Strategic Projects team until feasibility is demonstrated. Because of the scale and ambition of these projects, it is anticipated that preliminary budget allocations will be focused on resourcing the investigation of key opportunities and the development of robust business cases.

Stream 3: Community engagement

Engaging the community is recognised as a vital outcome for this strategy. This stream will initially focus on communicating the outcomes of Council-led initiatives and will progress to comprehensive engagement actions as the strategy moves into later stages of implementation. This stream will be overseen by the Strategic Projects team.

Across these three streams this strategy seeks to deliver on the objectives of the sustainability strategy and create a robust framework for ambitious implementation.

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1. Policy context



Aerial view of Bargara

1.1 International/Federal policy

Australia ratified the Paris Agreement on 6 November 2016 to strengthen the global response to the threat of climate change. The Paris Agreement aims to keep a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. To this end, Australia has made a commitment to reduce carbon emissions by 26% to 28% on 2005 levels by 2030.

Currently the major Federal policy influencing council decision-making is the Emission Reduction Fund (ERF). The ERF provides incentives for emissions reduction activities across the Australian economy. Under the Fund, a range of activities are eligible to earn Australian carbon credit units. Projects must comply with an approved method that measures verifiable reductions in emissions and sets out the rules for activities which can earn carbon credits. Currently the budget for the fund is close to being exhausted.

Additionally, the Federal Government is supporting the energy sector by investing in the Australian Renewable Energy Agency and Clean Energy Finance Corporation - to fund innovation and tailor project finance that will support the development of the industry.

The Federal Government released the outcomes of its Review of Climate Change Policies in December 2017. The review acknowledged policy improvements are needed to keep up with technological changes, and the rest of the world.

As of early 2018, the federal government is starting the process of developing a long-term emissions reduction strategy which will be finalised by 2020.



1.2 State policy

The Queensland Government has set a state target in the Queensland Climate Transition Strategy to reach zero net emissions by 2050. Along with the interim target for at least a 30% reduction in emissions on 2005 levels by 2030, this target is a critical first step to drive the investment and action needed to transition Queensland's economy to a zero emissions future.

Three key climate commitments are listed in this strategy:

1. Powering Queensland with 50% renewable energy by 2030
2. Doing its fair share in the global effort to arrest climate change by achieving zero net emissions by 2050
3. Demonstrating its commitment to reducing carbon pollution by setting an interim emissions reduction target of at least 30% below 2005 levels by 2030

In addition, the Queensland Government has taken a lead role in developing and implementing a range of strategies and initiatives that include:

- Adopting the Queensland Climate Adaptation Strategy (2017-2030)
- Implementing a Coastal Hazards Adaptation Program
- Pursuing opportunities for alternative energy and changed land management practices

Furthermore, the Queensland Government announced the development of a comprehensive waste management strategy. This strategy will be underpinned by a waste disposal levy aimed at increasing recycling and recovery and will come into effect in the first quarter of 2019. The new strategy will set the stage for clear targets, market-based incentives, and companion and measures to reduce waste and increase resource recovery and recycling. The long term target is to attain zero avoidable waste disposed of to landfills by 2050.

1.3 Local policy

Council became an inaugural member of the Cities Power Partnership in 2017 as a means to reinforce its commitment toward clean energy and sustainability. The Cities Power Partnership is a national program that exists to celebrate and accelerate the emission reduction and clean energy successes of Australian towns and cities. It's a coalition made up of mayors, councillors and communities who are committed to a sustainable, non-polluting energy future.

Under the Cities Power Partnership, participating councils select 5 key actions on which to focus and demonstrate their commitment to a more sustainable future. Bundaberg Regional Council has pledged to take the following actions under the Cities Power Partnership program:

Table 1: Bundaberg Regional Council commitments under the Cities Power Partnership

Category	Pledge items	Example projects
Renewable energy	Power Council operations directly by renewables (i.e. with solar PV). Set targets to increase the level of renewable power for council operations over time.	Rubyanna Waste Water Treatment Plant Solar System (450 kW); Airport (100 kW); and other solar installations on Council-owned assets.
Renewable energy	Install renewable energy (solar PV and battery storage) on Council buildings.	Multiplex Solar System (100 kW) + Battery Backup (200 kW).
Renewable energy	Implement landfill gas methane flaring or capture for electricity generation.	Landfill gas flaring fully commissioned on two of Council's landfills
Sustainable transport	Provide fast-charging infrastructure throughout the region at key locations for electric vehicles.	Electric vehicle (EV) charging stations as part of the Queensland Electric Super Highway. Additional EV stations installed at the Bundaberg Multiplex and as part of the Burnett Heads Redevelopment.
Work together and influence	Set city-level renewable energy or emissions reduction targets and sustainable energy policies to provide a common goal and shared expectations for local residents and businesses.	Sustainable Bundaberg 2030 Strategy Development

2. General approach

Bundaberg Regional Council has embarked on a range of successful initiatives to deliver positive outcomes under its Clean Energy Bundaberg Strategy (2014), and this strategy revision seeks to build upon that success. To do so it focuses on improving the processes that are already happening across the organisation by putting in place more comprehensive systems for improving practice across the organisation and empowering the different departments to act where they see the best opportunities. Additionally, this strategy formalises the approach to explore significant, Council-wide opportunities in a way that ensures that Bundaberg will maintain and expand the adoption of ambitious but financially viable projects.

This strategy recognises the key role of the Bundaberg community, and looks to phase in engagement that will allow Council to demonstrate a leadership role to support and guide broader initiatives. To do this, three streams have been identified. Each of these streams will run in parallel:

Stream 1: Business optimisation

This stream focuses on the actions taken internally to Council and cover the range of different actions to improve energy efficiency and utility usage. The activity in this stream will be administered directly by the different Council Departments, and identifies Department-specific actions and targets, with the Strategic Projects team providing oversight. The budget for this stream will largely fall within the operational budgets of the various departments or will be subject to the standard PDF review framework.

Stream 2: Flagship projects

This stream seeks to implement Council-wide or highly aspirational projects. This stream will be overseen by the Strategic Projects team until feasibility is demonstrated. Because of the scale and ambition of these projects, it is anticipated that preliminary budget allocations will be focused on resourcing the investigation of key opportunities and the development of robust business cases.

Stream 3: Community engagement

Engaging the community is recognized as a vital outcome for this strategy. This stream will initially focus on communicating the outcomes of Council-led initiatives and will progress to comprehensive engagement actions as the strategy moves into later stages of implementation. This stream will be overseen by the Strategic Projects team.

Across these three streams this strategy seeks to deliver on the objectives of the sustainability strategy and create a robust framework for ambitious implementation. Within the context of this approach, sections 3, 4 and 5 below explores the streams in more detail.

3. Stream 1: Business optimisation



Rubyanna Wastewater Treatment Plant solar panels

The first stream looks at the specific opportunities that exist within the services and assets operated by Council and is focused on integrating a process of continuous improvement into the way that Council conducts its business.

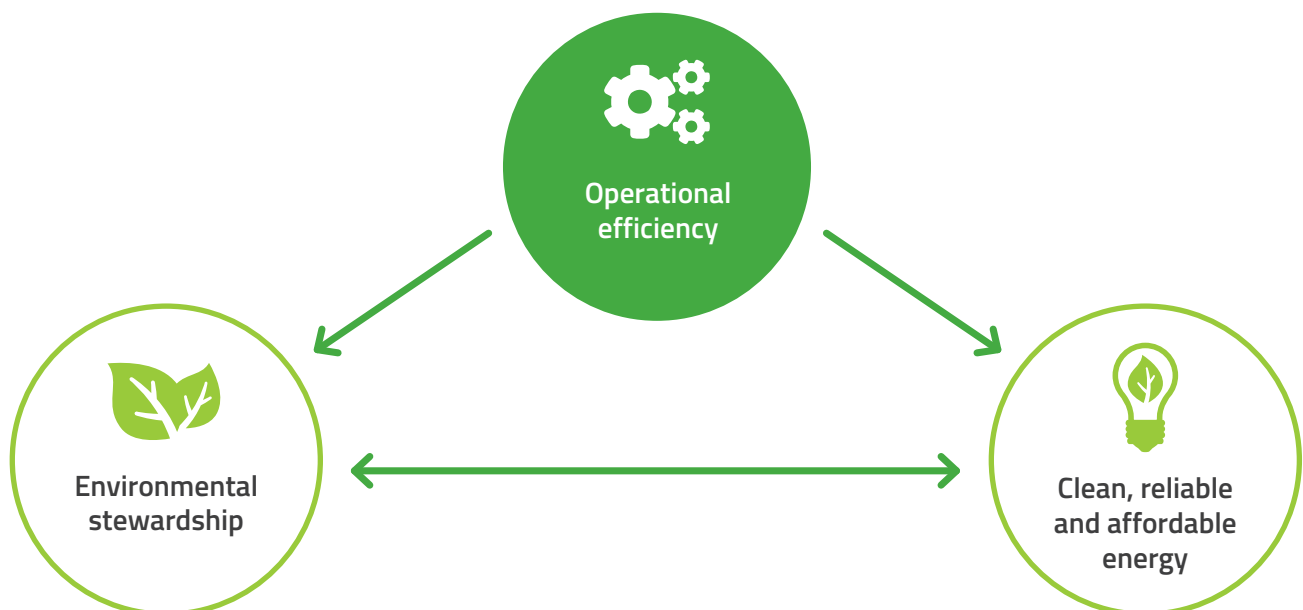


Figure 1: Strategic drivers

This approach enables department integration into the sustainability strategy, with a clear understanding of the role that they play and how their actions contribute toward the overarching strategy. Because the departments have the best knowledge of how their asset base and activities work, and stand to directly benefit from the operational savings that are obtained through actions being considered, this strategy identifies them as the key drivers in driving action for this stream.

Not all departments have the same types of opportunities for action or have the same scale

of emissions. To make program delivery easier, this strategy focuses on targeting one or more key areas of emissions for each department and tailors their actions based on these. Once the strategy is implemented, expanding the focus of actions into areas that had not previously been identified will be possible if implementation of action on these initial areas of focus areas is successful.

The primary focus areas for each department is highlighted in the table below, with departments aggregated where there are similarities in focus:

Table 2: Focus of Council departments

	Improvement stationary energy use	Improvement transport fuel use	Improvement to waste emissions	Capacity and expertise
Asset Maintenance	●			●
Business Services	●			
Fleet		●		
Libraries	●			
Parks and Sports	●	●		
Roads	●	●		
Sustainability				●
Waste		●	●	
Water	●		●	
Venues and Facilities	●			



Burnett bridge

3.1 Metrics

To aid with the delivery of this stream, performance metrics for the various departments are used to identify opportunities and track change over time. These metrics are selected specifically for each of the departments and reflect both their primary area(s) of activity and the sources of emissions that have been identified as their key focus. Additionally, these metrics are selected based on readily available information that will not increase administrative overheads, but should provide effective channels for decision-making, option selection, and trend reporting both internal to each department, and for communicating outcomes to the broader Council.

There are two types of metrics proposed in this strategy, which can be broadly categorized as absolute and relative metrics.

1. Absolute metrics measure the amount of activity overall and are good for tracking trends towards department and Council targets. Examples of absolute metrics are 'Total kWh of electricity consumption', and 'Total kL of diesel consumed'.

2. Relative metrics are used to track changes while correcting for variations in service delivery by the department. This is a useful measure in day-to-day operations, as it allows for the department to understand how effective their actions have been without being confounded by other factors such as taking on new assets. An example of a relative metric is 'electricity consumption per megalitre of water'. A metric like this allows Council to quantify and compare electricity consumption relative to the volume of water pumped, which may take into account environmental factors (e.g. significant rainfall event, drought, or malfunctioning equipment that increases electricity consumption).

Through a combination of these metrics it will be possible for Council, and the individual Departments, to stay on track for large scale transition.

3.2 Council strategy

3.2.1 Council Profile

In FY2016/17, Water and Wastewater, Roads and Drainage, Fleet Services and Venues and Facilities accounted for the largest energy (electricity and fuel) cost (Figure 2). 34% of Council's energy cost was attributed to Water and Wastewater due to electricity required to power Council pumps as well as sewerage and water treatment plants. The energy costs for each department is further detailed in Section 0 below in the respective department sections.

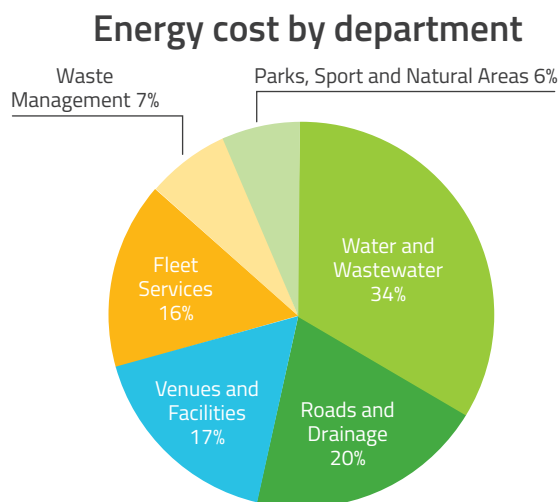


Figure 2: Cost of energy¹ by department

Table 2 shows the distribution of energy consumption by department. Water and Wastewater accounts for 52% of all of Council's electricity consumption and Fleet Services accounts for 53% of all of Council's fuel consumption.

Table 3: Distribution of energy consumption by department

Department	Electricity	Fuel
Fleet services	-	52%
Parks, sport and natural areas	4%	12%
Roads and drainage	16%	16%
Venues and Facilities	26%	-
Waste Management	2%	19%
Water and Wastewater	52%	-
Other	0.4%	-

¹Figures include both electricity and fuel costs.

Figure 3 below represents Council’s carbon emissions profile by department. Whilst this is not the primary focus of this strategy, this provides a useful framework to measure Council’s sustainability performance and also, align to broader national and international targets.

Council emissions by department

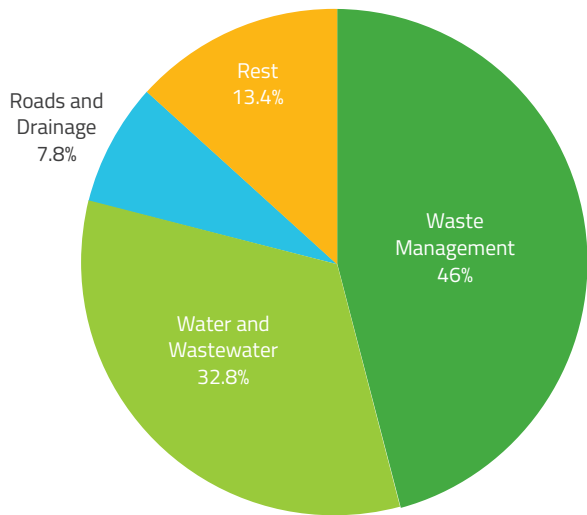


Figure 3: Council corporate carbon emissions summary

Although Waste Management is ranked 6th in terms of departmental energy cost expenditure, it accounts for a significantly higher proportion of Council’s carbon emissions than Water and Wastewater and is the highest emitter at 46%. This is due to greenhouse gas emissions from

Department	t CO2-e	%
Waste Management	29,767	46.0%
Water and Wastewater	21,197	32.8%
Venues and Facilities	5,050	7.8%
Roads and Drainage	4,092	6.3%
Fleet Services	3,041	4.7%
Parks, Sport and Natural Areas	1,452	2.2%
Other	70	0.1%
Total	64,699	100%

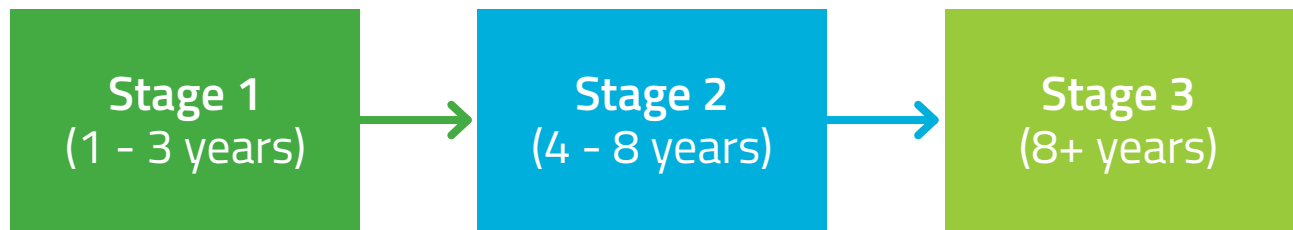
Council’s 7 landfills in operation which mainly consists of methane and carbon dioxide. Because methane has a global warming potential 25 times more detrimental to the atmosphere than carbon dioxide, Waste Management has the highest carbon emissions of all the departments.

Baldwin Swamp



3.2.2 Council action plan and roadmap

This strategy lays out the road map for Council and each department (Section 0) in its sustainability journey. Specific actions have been identified and have been allocated to 3 stages or timeframes.



Stage 1 - these actions will be implemented in the next 1 to 3 years. Costs and impacts of stage 1 actions have been quantified and there is high confidence of outcomes and benefits. There are also actions to carry out feasibility studies and trials and more broadly to investigate opportunities that have been identified for Stage 2.

Stage 2 – these actions will be implemented in the next 4 to 8 years. These are opportunities that have been identified with many existing test cases that will provide clear benefits and outcomes for Council.

Stage 3 – The current action plan covers actions up to FY 2025/26. Currently there are no specific actions identified beyond 8 years. Council will be looking for opportunities and innovative solutions to achieve its 2030/31 target. Flagship programs like adopting into a Power Purchase Agreement for clean energy present opportunities for significant reduction of energy consumption for Council. These are discussed further in Section 4.

Solar farm installed at Rubyanna Wastewater Treatment Plant



3.2.3 Council target and metrics

Absolute target

Based on the full implementation of the action plan, Council's interim target is a reduction of 10% of its annual corporate carbon emissions by 2025/26 based on 2016/17 levels.

To align with national and international targets, Council will have to reduce its annual corporate carbon emissions by 38% by 2030/31 based on

2016/17 levels. We have termed this "Required Annual Reduction". It is common to represent this as a linear trajectory for simplicity.

Figure 4 below shows Council's trajectory to 2025/26 if the action plan was implemented against the required trajectory to align with national and international targets.

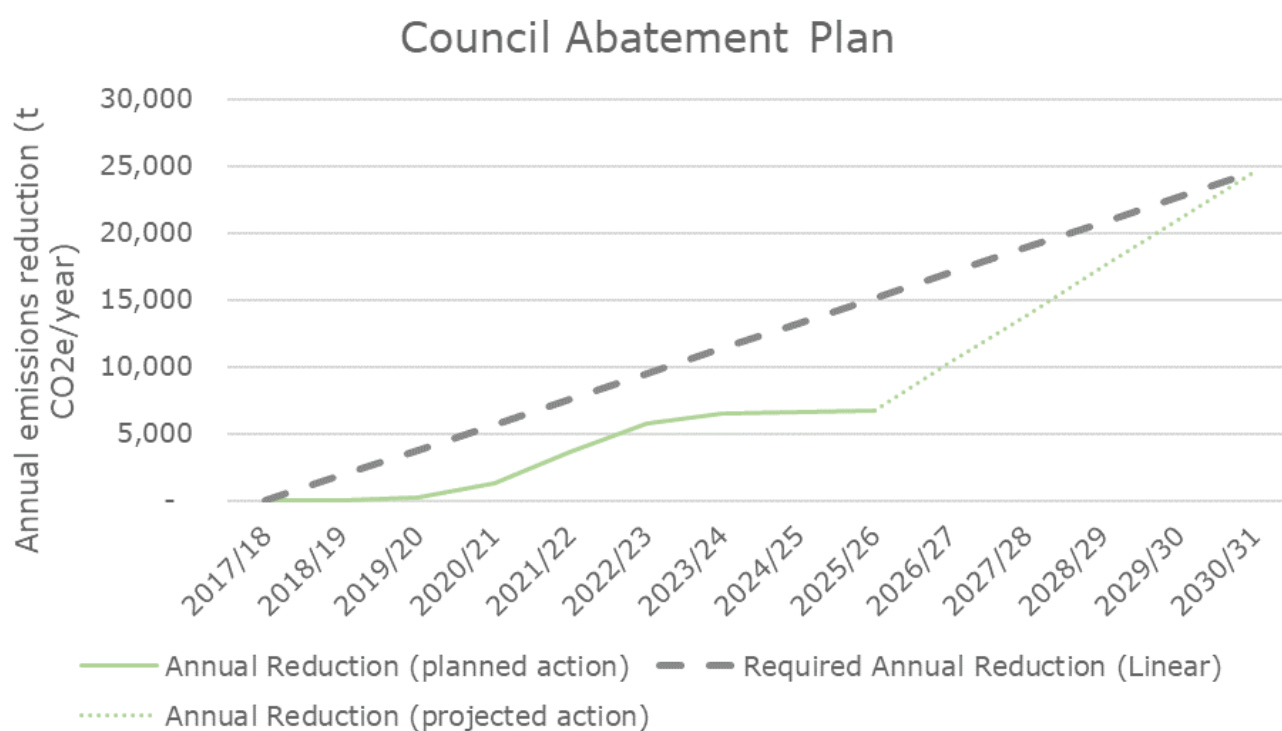


Figure 4: Council carbon emissions abatement plan

3.2.3 Council target and metrics

Metrics

To track the trajectory of Council towards the target outlined above, the **absolute metric of t CO₂-e** will be used to quantify Council's corporate carbon emissions.

3.3 Department strategies

This section is organised by department and will cover the various departmental actions, which support the overall Council sustainability strategy and target. The intent is for each department to take ownership of their strategy and to actively refresh their sections going forward. Strategic Projects will provide supervision and oversee the implementation of this strategy. Specifically, each section can be considered a department strategy and will include:

Table 2 shows the distribution of energy consumption by department. Water and Wastewater accounts for 52% of all of Council's electricity consumption and Fleet Services accounts for 53% of all of Council's fuel consumption.

- 1. Department consumption profile –**
Department energy costs and carbon emissions (includes scopes 1, 2 and 3) are given.
- 2. Action Plan –** Lists the broad actions and opportunities for each department.

This strategy covers the following departments and areas:

- Water and Wastewater
- Waste Management
- Roads and Drainage
- Fleet Services
- Venues and Facilities (includes Venues and Facilities; Commercial Business and Tourism; Libraries, Arts and Theatre; and Asset Maintenance Services)
- Parks, Sports and Natural Areas
- Strategic Projects
- Other actions

3.3.1 Water and Wastewater

The Water and Wastewater department manages the treatment, distribution and flow of water and wastewater in the municipality. Because of servicing the entire municipality, Water and Wastewater consumes the most electricity of any department across Council.

3.3.1.1 Consumption profile

In FY2016/17, Water and Wastewater accounted for approximately 34% of Council's energy cost (Figure 5) and 33% of Council's total carbon emissions (Figure 6).

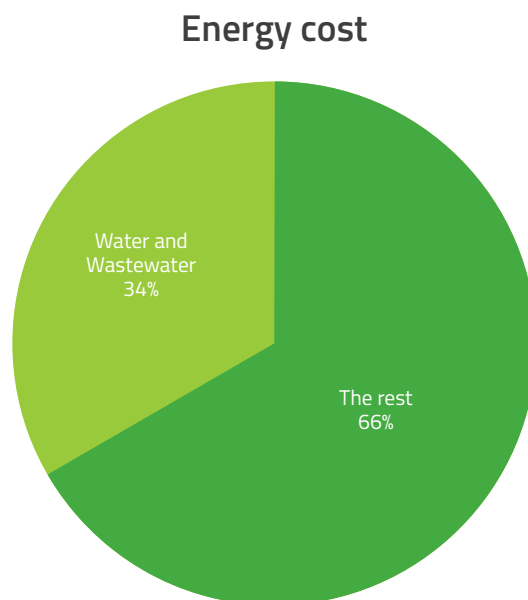


Figure 5: Water and Wastewater energy cost proportion

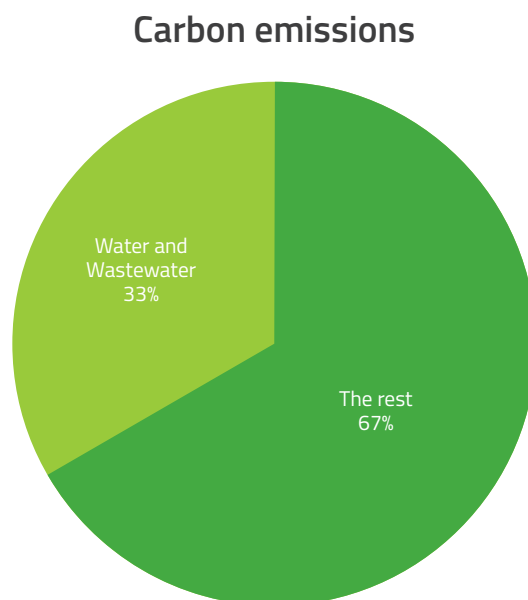


Figure 6: Water and Wastewater carbon emissions proportion

The bulk of electricity consumption is attributed to running water treatment plants and water pumping around the municipality. Additionally, fuel is used for staff transportation.



Rubyanna Wastewater Treatment Plant

3.3.1.2 Action plan and road map

Table 4 lists the broad actions for Water and Wastewater to support Council's 2025/26 target.

Table 4: Action plan for Water and Wastewater

Goal	Action
Implement Stage 1 (Pilot) of Council's smart water network	The smart water network pilot includes 1500 smart water meters in conjunction with network-embedded technology deployed across District Management Areas (Burnett Heads, Childers, Bundaberg CBD, and Gin Gin).
Undertake subsequent stages of Council's smart water network project. Scope, timing and cost will be dependent upon pilot outcomes and future hydraulic modelling.	Undertake hydraulic modelling in select locations across the region
	Contingent upon modelling and results from pilot, rollout region-wide smart water network ³
Conduct feasibility study/trial of battery technology (coupled with solar PV)	Select appropriate site (e.g. treatment plant) and conduct feasibility study.
	Implement trial contingent upon study outcome.
Implement asset maintenance policy ⁴	Develop data management plan for gathering, organising and administering data from across the Water and Wastewater Department.
	Develop analytics capabilities (implementation of software platform and developing internal expertise)
	Develop processes by which to proactively manage assets based on informed decisions from data analytics

³The 12-month pilot will provide an understanding of integration of data into existing systems and direction on an appropriate commercial and technical model. The duration of 12 months affords opportunity to assess seasonal consumption, 4 quarters of data against manual read validations as well as providing adequate time and sample data to extrapolate results. The result of this pilot will determine the scope of further implementation across the region.

⁴Preliminary costing at this stage, as this is largely dependent on the outcomes of the data warehouse solution.

3.3.2 Waste management

The Waste Management department manages Council's waste collection, transfer stations and landfills. This department has the largest total emissions at Council, almost entirely due to emissions from landfill.

3.3.2.1 Consumption profile

In FY2016/17, Waste Management accounted for around 7% of Council's energy cost (Figure 7) and 46% of Council's total carbon emissions (Figure 8).

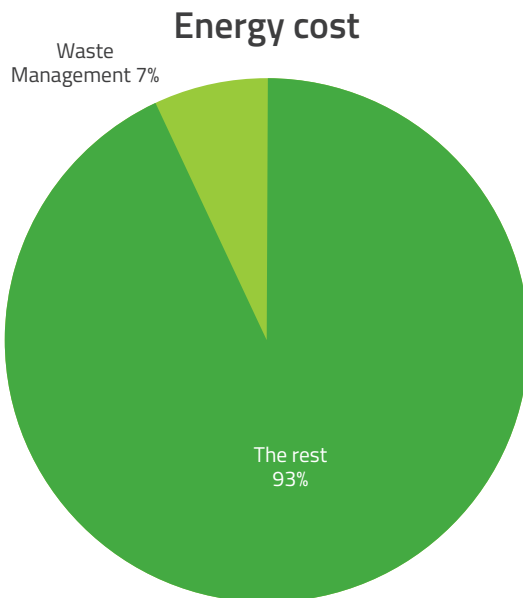


Figure 7: Waste Management energy cost proportion

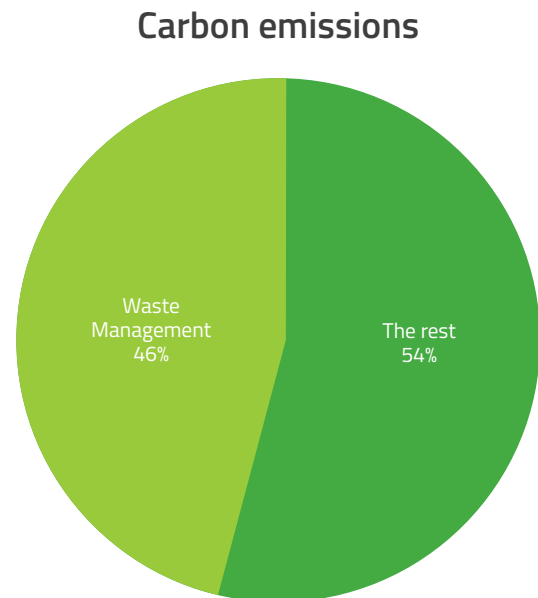


Figure 8 Waste Management carbon emissions proportion

The bulk of cost is attributed to fuel cost for running waste collection trucks, followed by electricity consumption of waste facilities.

University Drive waste facility



3.3.2.2 Action plan and road map

Table 5 lists the broad actions for Waste Management to support Council's 2025/26.

Table 5: Action plan for Waste Management

Goal	Action
Develop Council's internal Waste Reduction and Recycling Plan (procurement to disposal of purchased goods)	Assemble working group from required Council departments
	Adopt plan as part of Sustainable Bundaberg 2030 program and link to Wide Bay Regional Waste Strategy
Implement waste diversion for organics	Perform feasibility of organics diversion options (collection through to disposal)
	Advertise Expression of Interest (EOI) for commercial operator to manage disposal of green waste
Investigate electricity generation using captured landfill gas at University Drive and Cedars Road	Contractor to finalise feasibility study pending Federal Government's decision on availability of Australian Carbon Credit Units (ACCUs).
	Council to perform due diligence on commercial arrangements (also pending outcome of Federal Government's decision on ACCUs).
Implement policies and actions that support LGAQ's target of "zero waste to landfill" by 2028	Review Council's recycling and reprocessing options, particularly in regard to China's National Sword Policy and the impending levy on commercial (and potentially household) waste
Leverage landfill consolidation effort to better manage waste as a resource	Develop plan for how each of Council's waste facilities is utilised to encourage proper recycling and repurposing of waste

Landfill flaring system at the Cedars Road waste facility



3.3.3 Roads and Drainage

The Roads and Drainage department manages Council’s roads, street lighting and stormwater infrastructure.

3.3.3.1 Consumption profile

In FY2016/17, Roads and Drainage accounted for around 20% of Council’s energy cost (Figure 9) and 6% of Council’s total carbon emissions (Figure 10).

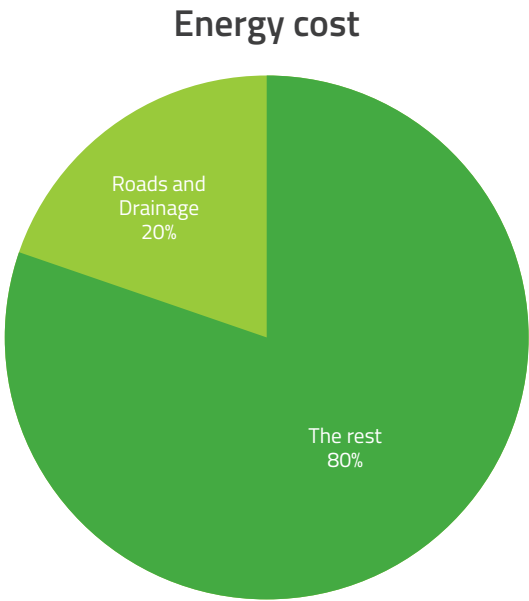


Figure 9: Roads and drainage energy cost proportion

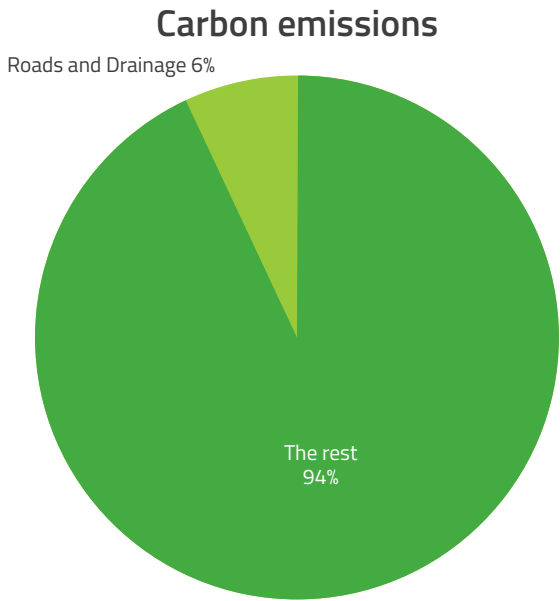


Figure 10: Roads and drainage carbon emissions proportion

The bulk of energy cost is attributed to electricity consumption for street lighting, followed by fuel consumption of vehicles and plant equipment.

3.3.3.2 Action plan and road map

Table 5 lists the broad actions for Roads and Drainage to support Council’s 2025/26 target.

Table 6: Action plan for Roads and Drainage

Goal	Action
Lobby State and Federal Governments to endorse a transition from old street lighting technology to energy efficient LEDs (preferably with capacity to integrate smart technology).	Develop a business case outlining the costs/benefits of installing LED street lights across the region
	BRC, in conjunction with other Councils across Queensland, to provide continued advocacy at State and Federal levels for transitioning to smart LED street lighting.
Develop partnership with Ergon that allows open dialogue and implementation of trials	Work with Ergon on community and environmentally focused projects (e.g. turtle lighting) to deploy smart street lighting along our coast

3.3.4 Fleet Services

Fleet Services manages all business related to the purchase, hire, maintenance and disposal of Council owned vehicles. Fleet Services manages and hires approximately 1,500 assets to all Council Departments.⁵ Departments are charged a fixed periodic charge or by an hourly rate for the use of fleet assets which is determined by the expected total annual utilisation of the asset type. These assets are comprised of light vehicles, heavy vehicles, plant, yellow plant and minor plant equipment. Fleet Services also services the vehicles in Council's fleet.

3.3.4.1 Consumption profile

In FY2016/17, Fleet Services accounted for around 7% of Council's energy cost (Figure 11) and 46% of Council's total carbon emissions (Figure 12).

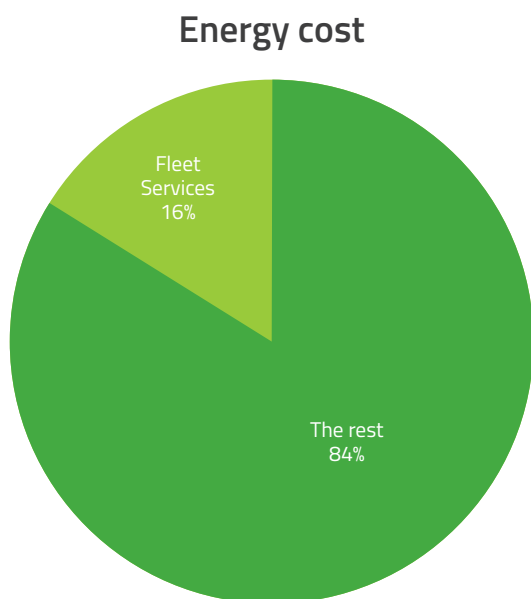


Figure 11: Fleet services energy cost proportion

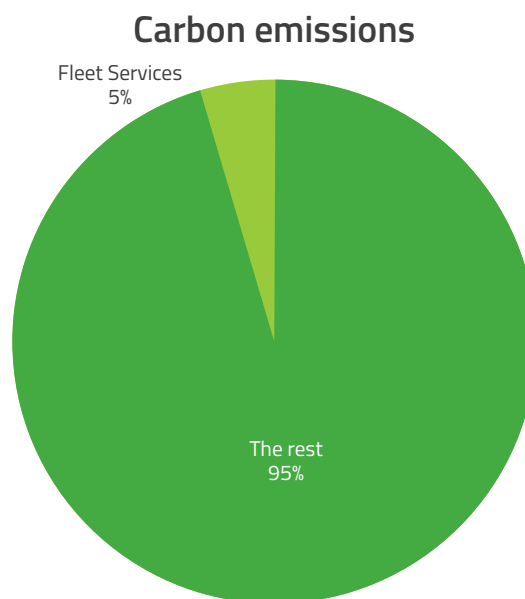


Figure 12: Fleet services carbon emissions proportion

The bulk of energy cost is attributed to fuel cost for running waste collection trucks, followed by electricity consumption of waste facilities.

3.3.4.2 Action plan and road map

Table 6 lists the broad actions for Fleet Services to support Council's 2025/26 target.

Table 7: Action plan for Fleet Services

Goal	Action
Consider all new and emerging sustainable or fuel-efficient technologies as practical for implementation across Council's fleet	Continued collaboration with relevant departments as to the requirements and opportunities of new and emerging fuel-efficient technology
Improve capabilities around fleet vehicle data management	Deploy Stage 2 of GPS technology across fleet vehicles
	Develop internal capacity to manage and administer data analytics
	Implement data analytics platform to interpret data and increase efficiency through better fleet decision making

⁵Note the fuel data in this section includes all asset fuel consumption except for minor plant equipment.

3.3.5 Venues and Facilities (whole of organisation)

This section includes the following components:

- **Venues and Facilities** department, which oversees all of Council's community facilities which include over 200 assets across 60 sites, and includes the public swimming pools in Bundaberg, Childers and Gin Gin.
- **Commercial Business and Tourism**, which manages a number of facilities, including the following:
 - Bundaberg Regional Airport
 - Hinkler Hall of Aviation
 - Fairymead House Sugar History Museum
- **Libraries, Arts and Theatre**, which is responsible for such assets that include:
 - Bundaberg and Childers Libraries
 - Moncrieff Theatre
 - Bundaberg Regional Art Gallery and Childers Art Space (CHARTS)
- **Asset Maintenance Services (AMS)** provides broad services for updating and maintaining buildings and facilities for all Council departments. AMS works closely with the asset managers across Council to provide maintenance and energy efficient solutions.

3.3.5.1 Consumption profile

In FY2016/17, Venues and Facilities accounted for around 17% of Council's energy cost (Figure 13) and 8% of Council's total carbon emissions (Figure 14).

Energy cost

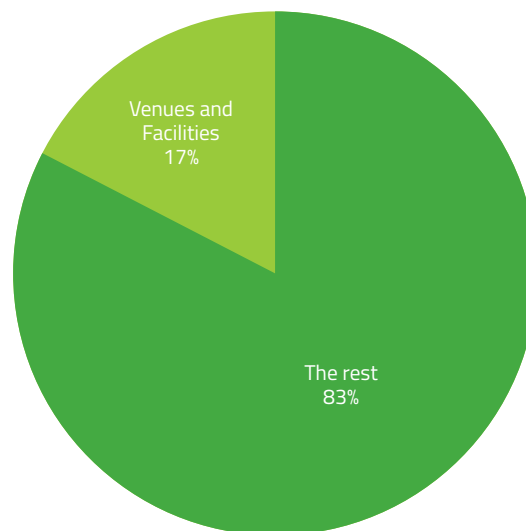


Figure 13: Venues and Facilities energy cost proportion

Carbon emissions

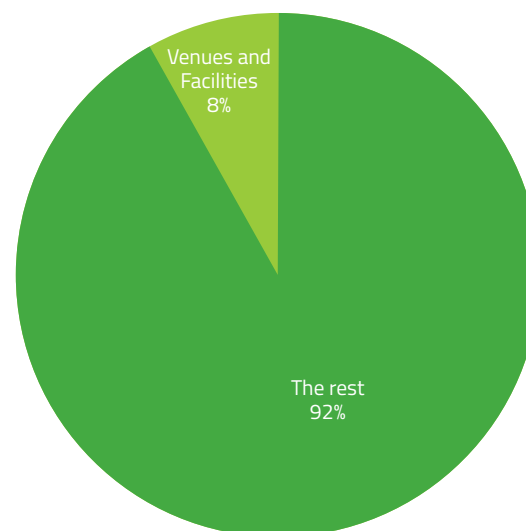


Figure 14: Venues and Facilities carbon emissions proportion

All the energy cost is attributed to building electricity consumption.

3.3.5.2 Action plan and road map

Table 8 lists the broad actions for Venues and Facilities to support Council's 2025/26 target.

Table 8: Action plan for Venues and Facilities

Goal	Action
Implement energy efficiency solutions and upgrades across existing Council buildings and facilities	Perform electricity analysis on Council owned assets. Early stage analysis will largely be manual until planned deployment of software platform is in place to assist with detailed electricity profiling and analytics.
	Conduct energy efficiency audits across high consumption facilities. Develop a repeatable internal process for conducting energy efficiency audits across Council facilities.
	Collaborate with Asset Maintenance Services (AMS) around scoping and design of energy efficient solutions.
Implement solar PV installations across facilities	Undertake solar PV feasibility assessments for top electricity consuming sites.
	Install solar systems on relevant Council facilities, with public swimming pools being a top priority.
Complete major energy efficiency upgrades	Install remaining three air conditioners and building management systems in Council Administration Building.
Integrate energy efficient solutions within early stage plans for future asset development	Incorporate energy efficient solutions within the electrical plans for Recreation Precinct Master plan (e.g. solar PV, lights, sensors, timers, etc.).
	Incorporate energy efficient solutions within plans for the Gin Gin Neighbourhood and Service Centre.

Aerial view of the solar panel system at the Multiplex Sports and Convention Centre



3.3.6 Parks, Sport and Natural Areas

The Parks, Sport and Natural Areas department maintains Council's parks and open spaces. Assets include open space lighting, public toilets, pavilions, barbeques and sheds. The sections below detail energy use and work done internally by Council staff but it is noted that a large proportion of maintenance work is contracted out to third parties.

3.3.6.1 Consumption profile

In FY2016/17, Parks, Sport and Natural Areas accounted for around 6% of Council's energy cost (Figure 15) and 2% of Council's total carbon emissions (Figure 16).

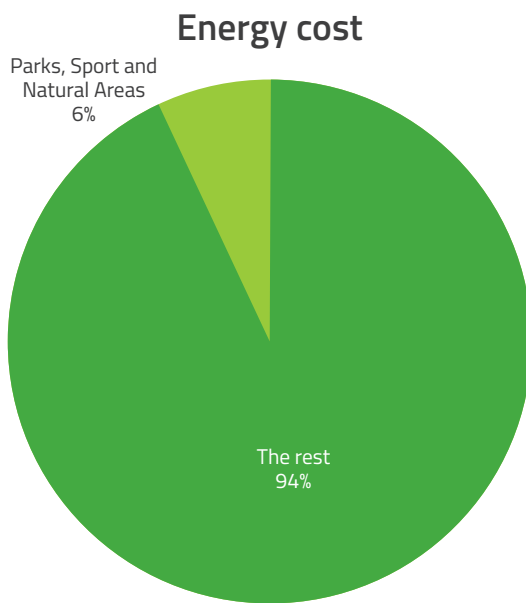


Figure 15: Parks, Sport and Natural Areas energy cost proportion

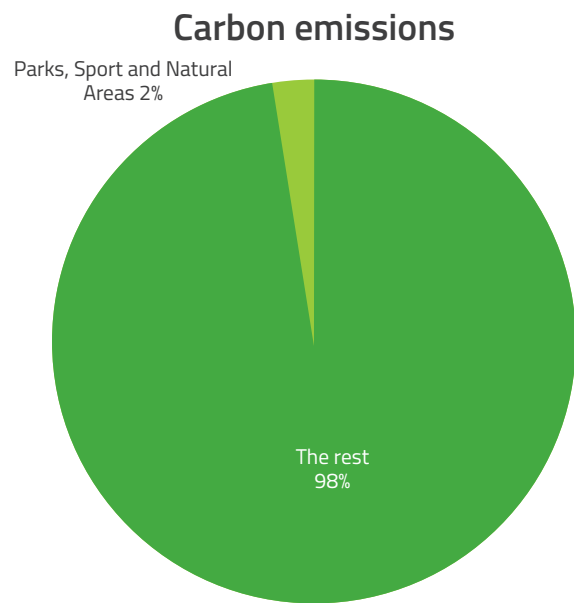


Figure 16: Parks, Sport and Natural Areas carbon emissions proportion

Most of the energy cost is attributed to stationary and transport fuel consumption. Electricity consumption is attributed to open space lighting, public toilets, pavilions, barbeques and sheds.



3.3.6.2 Action plan and road map

Table 9 lists the broad actions for Parks, Sport and Natural Areas to support Council's 2025/26 target.

Table 9: Action plan for Parks, Sport and Natural Areas

Goal	Action
Adopt procurement strategy for energy efficient equipment and solutions	Document policy around procurement and deployment of energy efficiency solutions
Include annual budget allocation for deployment of energy efficient solutions (includes replacement inefficient/outdated equipment)	Schedule departmental quarterly review to identify energy efficiency projects for investment
Plan and implement water efficiency practices into department operations	Deploy efficient water solutions (e.g. taps, showers, rainwater tanks, smart irrigation, etc.)
Implement electric small plant equipment into asset inventory (e.g. blowers, trimmers, mowers, etc.)	Undertake equipment trials and invest in proven equipment where appropriate
Transition appropriate fleet vehicles to hybrid/electric alternatives (e.g. passenger vehicles)	Investigate technology options and work with Fleet Services to procure hybrid/electric vehicles
Invest in renewable energy generation on department-owned buildings and assets	Install solar system (and where feasible battery backup) on satellite offices, shelters, amenity blocks, etc.
	Investigate the option of small scale wind power generation to provide power to small scale facilities

Bargara beach esplanade





3.3.7 Strategic projects

Strategic Projects will coordinate and oversee the delivery of this strategy. This role includes:

- Maintaining the software tools to monitor electricity consumption and associated cost
- Collaborating with departments to re-calibrate targets as required
- Disseminating the required electricity and fuel data (from Fleet Services) to the departments as inputs into the respective metrics

- Periodically consolidating department outputs and reporting to Executive Leadership Team
- Taking the lead on large projects (flagship programs) that span multiple departments
- Updating the strategy as required

Table 10 below covers the planned expenditure and road map for Strategic Projects.

Table 10: Action plan for Strategic Projects

Goal	Action
Implementation of electricity monitoring platform	Review current needs and available solutions, establish monitoring plan (electricity data only)
	Resourcing to assist with managing sustainability program and data analytics
Council to collaborate with a leading biofuels company to conduct a feasibility study for a regional Biofutures Park that includes development of a commercial biogas plant with capacity for producing biocrude oil.	Biofuels company is conducting ongoing feasibility studies and investigations into development of this site.
Investigate large scale solar PV or wind farms, with a range of financing options being considered	Investigate Power Purchase Agreements and consult with other Councils that have similar experience

3.3.8 Other actions and road map

This section covers the planned expenditure and road map for planning and capital works to 2025/26.

Table 11: Action plan for Planning and Capital Works

Goal	Action
Planning	
Determine the status of sustainable building design in the community and assess best pathways for building capacity.	Review of planning practices and develop Environmentally Sustainable Design Standards/Guidelines
Update Bundaberg Regional Council's Planning Scheme with desired standards of LED street lighting	Work with Queensland Government to update Council's planning scheme in regards to lighting standards within designated turtle sensitive areas.
	Investigate the potential for updating Council's Planning Scheme to require LED lighting to be installed in all new in green field developments.
Economic Development	
Support the renewable energy industry and promote investment throughout the Bundaberg Region	Identify opportunities to strengthen the presence of clean energy businesses throughout the region
Capital Works	
Establish a formal process by which projects that meet certain requirements (such as size of project, or specific building classes) require assessment at the conceptual and detailed design stages by an Environmentally Sustainable Design (ESD) qualified council staff member/committee.	Establish a framework for assessing ESD targets. Identify internal capacity for undertaking assessments ⁶

⁶This activity will leverage the work done around developing the Environmentally Sustainable Design Standards/Guidelines.

4. Stream 2: Flagship projects



Electric car charging station in Burnett Heads

Beyond the work being carried out through Stream 1, there are a range of opportunities of a scale and ambition that are not suitably applied to an individual department. Additionally, many of these opportunities will require time to establish their business viability and will not immediately demonstrate a clear business case for investment until this preliminary work is done.

However, it is vital for Council to appropriately resource the investigation of these opportunities, as they may present both incredible utility and operational savings, as well as dramatically changing the emissions profile of the organisation.

Because of the high degree of uncertainty of projects that are proposed to be investigated as part of this strategy, there are two levels of investment that are recommended:

- **Level 1:** Funding to undertake feasibility studies and other required investigations of flagship opportunities. This funding should be established as an ongoing budget

item and will ensure that exploration of these opportunities will be possible for the duration of the strategy.

- **Level 2:** Funding associated with implementing of specific flagship projects. This is a highly variable quantity that may exceed millions of dollars, depending on the specific projects being considered. Additionally, solutions may have highly variable options for financing that make actual costs to Council difficult to anticipate. For this level we do not recommend that any funds are allocated upfront and that funding is considered on a case-by-case basis.

4.1 Stream 2 opportunities

There are many projects that may be considered as being viable for preliminary investigation. It is recommended that the Strategic Projects Team undertake an internal review of options before beginning the process of selecting options for more detailed investigation.

4.1.1 Renewable Energy Power Purchase Agreements

A renewable energy power purchase agreement (PPA) is an agreement between an electricity generator (e.g. solar or wind farm) and electricity buyer, whereby a long term contract is formed to provide the supply of renewable energy. PPA's can be structured in a variety of ways, however the primary intent is to provide a reliable source of renewable energy with relative price certainty over a long period of time. Organisations with the capacity to finance projects involving PPA are helping to drive investment in renewable energy projects and accelerate the transition to cleaner energy supplies. Furthermore these projects provide a wide range of benefits to purchasers (and the broader community) that include job creation, stable electricity prices and lower costs, positive environmental outcomes, and recognition as leader in sustainability.

The global corporate renewable PPA market is growing rapidly with 5.4 GW of clean energy purchased by corporations in 2017 compared to the previous record of 4.4 GW in 2015. While the majority of renewable corporate PPAs are occurring in the U.S., volumes are steadily increasing in the Asia Pacific region due in part to increasing demand for sustainable and economical energy solutions, as well as regulatory changes.⁷

In Australia, a number of PPAs have been signed in recent years, including following examples:

- Sunshine Coast Council funded the design and construction of a 15MW solar farm, which supports its target to reach 100 MW of low carbon energy generation capacity by 2020.
- The Melbourne Renewable Energy Project, a collective of local governments, cultural institutions, universities and corporations, have constructed an 80MW wind farm at Crowlands, a small agricultural community.
- Telstra signed two corporate PPAs in 2017, agreeing to buy the output of a new 70MW solar farm near Emerald, and then led a consortium comprising ANZ, Coca-Cola Amatil, Telstra and the University of Melbourne to enter into a PPA for the 226MW first stage of the Murra Warra Wind Farm in western Victoria.

Council has significant opportunity for entering into a future renewable energy PPA. One such opportunity is the Childers Solar Farm - a utility scale renewable energy project with an output measuring up to 120MW located between Childers and Cherwell River. The \$210M project will comprise of approximately 400,000 solar panels generating enough electricity to power the equivalent of 65,000 homes. The project is being developed by one of Australia's leading renewable energy developers ESCO Pacific Pty Ltd.

There are presently a number of proposals driven by private industry that are being pursued with the Bundaberg Region that provide Council with a range of options for developing and entering into a PPA.

4.1.2 Electric Vehicle Transport Infrastructure

Electric Vehicles present the most promising strategy for reducing emissions from the transport sector. Increasingly electric vehicles present a like-for-like technology replacement for conventional ICE (Internal Combustion Engine) vehicles, meaning that there are no significant implications for end users in switching to the new technology. The primary issues have been range and cost, with both of these factors improving rapidly in the previous few years (from 2014 to 2017 alone we saw an increase in average range of consumer vehicles from around 120km to around 270km on a single charge). Cost continues to decrease as well, with more vehicles entering the mid-range price brackets.

With these trends expected to continue, the widespread adoption of electric vehicles will present the best opportunity for reducing emissions from transport by being able to supply the required energy from renewable sources (such as solar PV).

Required infrastructure

Electric vehicles require a different type of infrastructure to that of conventional vehicles, and local government is well placed to get involved in providing this. Electric vehicles require charge stations, which are significantly cheaper than standard petrol pumps and only require to be connected to conventional electricity infrastructure, rather than requiring their own distribution networks.



Figure 17:
Electric vehicle
charging station
in Childers

However, charge times may be up to several hours, which means that more charge stations are required for the same vehicle fleet, and for convenience it is better to have charge stations at destination points (such as homes or workplaces).

The Queensland Electric Vehicle Superhighway

The Queensland Government has recently announced a plan to install the required infrastructure in a 'superhighway' from Coolangatta to Cairns. This will pass along the Bruce Highway, with charge stations planned for Childers, Gin Gin, Miriam Vale, among other locations. This superhighway will pass within 50km of Bundaberg and will present an excellent basis for connecting local efforts of electric vehicle infrastructure with a broader state-based network.



Figure 18: The location of the Electric Vehicle Superhighway⁸

⁸ <https://www.qld.gov.au/transport/projects/electricvehicles/map>

4.1.3 Transition existing street lighting to Smart LED

Residential street lights have been changed over to LED in their hundreds of thousands (currently more than 400,000 across the country) and in the last year, councils are starting to replace their major road street lights to LED. Nationally, more than 100 Councils have successfully implemented a bulk change of their existing street lighting stock to LED.

Given that street lighting is one of the single largest sources of greenhouse gas emissions from local government, numerous councils from all around the country have been using proven and successful models that have repeatedly resulted in large cost savings and greenhouse

gas reductions. This represents a great opportunity for Bundaberg Regional Council to capitalise on the learnings, projects and latest technology trials from around Australia.

The savings from these types of projects are immediate and significant. As an example, switching over from an 80W mercury vapour to a 14W LED results in 82% of electricity savings immediately. Given that Council has approximately 7,000 street lights in the municipality, out of which, more than 3,000 are 80W mercury vapour, the potential savings from transitioning these lights to LED is significant. Table 12 details two case studies and demonstrates the savings associated with street lighting LED bulk changes:

Table 12: Case studies of LED bulk change programs

Case Study 1: Lighting the Regions – Central Victorian Councils

Sixteen local governments across north, west and central Victoria formed a partnership to implement the largest street lighting project in Australia at the time. This project saw the replacement of almost 23,000 street lights to more energy efficient LED technology and expected to reduce energy consumption and save partner councils \$57M over 20 years in energy costs.

Case Study 2: Light Years Ahead – Western Sydney Councils

The Light Years Ahead project was a partnership between Western Sydney Region of Councils (WSROC), Endeavour Energy, Ironbark Sustainability and nine Western Sydney member councils to deliver the largest energy reduction project in Western Sydney's history at the time. This project was implemented across nine local councils, with around 15,000 lights replaced across 136 suburbs resulting in a 77% reduction in greenhouse gas emissions. It is estimated that the cost savings over 20 years will be around \$20M for partner councils.

Presently, there are both regulatory and commercial drivers that will see Council's lights replaced to LED, even if no action is taken. The Federal Government is considering ratifying the Minamata Convention on Mercury which will result in the banning of any lights containing more than a specified amount of mercury from 2020. If Australia signs, the vast majority of current street light types will be banned from being imported into Australia from 2020, and lights that fail will likely be replaced with LED by Ergon Energy. Even if Australia does not sign, many of the countries which manufacture these lights have signed and therefore, it will be harder to source current light types.

With these changes on the horizon, Council can either:

1. Drive the change to LED by funding the project or;
2. Do nothing and leave Ergon Energy to gradually replace these lights to LED.



Childers streetscape

The difference between both options is the tariff that Council pays Ergon Energy for maintaining the asset over its life. Council will also need to consider the written down value of current light types. This an upfront cost that Council will pay Ergon for replacing an asset before the end of its life.

If Council chooses Option 2, the annual tariff for the maintenance of each street light will be significantly higher as shown in the table below:

Table 13: Ergon Energy maintenance tariff FY2017/18

Road type	\$/Year/light	
	Ergon funded	Council funded
	EOandO ⁹	GandEO ¹⁰
Major	\$422	\$170
Minor	\$251	\$112

Drawing from examples in other jurisdictions and South East Queensland, the equivalent of Option 2 has almost always been shown to have a negative or very unattractive cash flow for Council over 20 years. This is in comparison to Option 1 which will likely result in significant savings (both electricity cost savings and maintenance savings) over 20 years.

It is recommended that Council develop a detailed feasibility study in the next 1 to 2 years to assess the options, to drive negotiations with Ergon Energy and to deliver a street lighting project prior to 2020.

⁹ Ergon Owned and Operated

¹⁰ Gifted and Ergon Operated



4.1.4 Waste management

The waste management industry faces significant changes in Queensland over the short term, which will have significant ramifications on Council's long-term strategy. The introduction of Queensland's state-wide waste levy will add significant costs to operations and complexity to the existing system. The China Sword policy, along with low or no commodity prices for recyclables, will all have a negative effect on Council's recycling and its partners. The container refund scheme is likely to also reduce commodity prices for material recycling facility (MRF) outputs, and there are no guarantees that Council's MRF partner will gain a market share of the container refund point or processor revenue streams from the program.

Council will also need to consider the range and number of waste facilities provided going forward especially with the requirements due to the waste levy, increased environmental standards and the Queensland Government's zero waste to landfill by 2050.

4.1.5 Bundaberg Low Glow Turtle Initiative

Mon Repos Turtle Conservation Area supports the largest concentration of nesting marine turtles on the eastern Australian mainland and has the most significant loggerhead turtle nesting population in the South Pacific region.

This is a significant environmental asset for the Bundaberg Region and Queensland.

As noted in the Australian Government's Smart Cities Plan, regional areas face unique opportunities and challenges, and maximising their advantages through innovation and technology will be critical to supporting long term growth. No other region in Australia has the advantage of, or responsibility to protect, one of the highest concentrations of endangered breeding marine turtles in the South Pacific Ocean. Mounting scientific evidence indicates marine turtle populations are negatively impacted by urban sky glow, which disrupts adult turtle nesting site selection and hatchling ocean-finding behaviour.

The principle outcome of this initiative is to improve the survival rates of marine turtles by empowering citizens to leverage open data and smart technology to reduce urban glow. Urban glow sensors will be deployed to measure levels of light pollution in urban areas along the Bundaberg coast, the data from which will be used to create a publicly accessible web-based heat map. This real-time platform will raise community awareness of light pollution affecting turtles and also guide the deployment of smart lighting solutions that include motion sensor activated LED lighting and other controls (e.g. on/off switching, dimming, and timers) to further reduce urban glow. Open data, with the use of smart technology, will enable project partners to measure the impact of behaviour change and reduced glow on the survival rates of endangered marine turtles.

5. Stream 3: Community engagement



Community members stand-up-paddleboarding at Innes Park inlet

5.1 Stages of engagement

There will be significant variations in the method of engagement with community over the duration of this strategy. These changes will reflect the shift in focus from Council's own activities to broader engagement with the community and are designed around setting Council up with an effective base from which to advocate for change.

- Stage 1** Council-led focus with emphasis on communicating outcomes to community
- Stage 2** Engagement with large-scale projects and municipal-wide initiatives
- Stage 3** Community specific initiatives, transitioning the outcomes of the initial stages

The preliminary stages of this strategy will look to focus on successfully embedding large-scale change across the Council itself, and then at the next review period community engagement strategies should be identified based on the current perception and priorities of the broader municipality.

5.2 Communicating climate change

Communicating the impacts of climate change, as noted above, is both a vital part of any ongoing program but also one that needs to be carefully considered due to the political volatility that has been associated with this topic in the past. Council has the responsibility to reduce carbon emissions to achieve its corporate target; however, for broader community ambitions and targets, a range of stakeholders must be actively involved. It is important to realise that meeting the required emissions reduction is going to be challenging and will require the participation of all stakeholders involved. Different stakeholder groups have different levers that they can pull to activate change, and a plan that appropriately addresses these various groups will help to ensure and achieve the desired outcomes.

In working with the broader community, the key role of Council moves into one of oversight and facilitation. For many emissions areas, Council should be looking to empower the different community stakeholders with the right information about emissions originating

from their activities, and work with them to establish the best strategies for reducing them. Additionally, Council's role is to manage the collective understanding of the task ahead, while providing oversight and feedback where uncertainty exists for the correct pathway.

5.2.1 The Role of Science in the Discussion

Science, and science-derived targets, are important for setting program boundaries and expectations. There is a pressing need to depolarise the debate about climate change, and when introducing science-derived figures into the discussion, an important shift takes place:

- It removes the arbitrariness of political targets, and provides a framework for boundary setting that is outside of the variations of the political climate
- It seamlessly connects different scales, such as between states and cities, while providing a transparent method that can be subject to independent verification
- It turns the conversation into something concrete to be debated on specific terms, rather than abstract ones – if a group has an issue

As an example of the importance of bringing impartial targets into the discussion, the consultation paper being circulated by the Global Covenant of Mayors for Climate and Energy (GCoM)¹¹ incorporates an expectation that all cities will take steps to align their targets to the Nationally Determined Contributions, as established under the Paris Accords. This is an important step that will pave the way for far better collaboration.

5.2.2 Communicating the role of Council

Understanding the appropriate role of Council is critical to successfully engaging with the community on climate change issues. There have been many failed attempts at establishing targets and carbon emissions mitigation plans across Australia, and a common element of these failures has been due to not assigning appropriate roles and responsibilities, and not taking the time to facilitate collaborative action between these entities. A common example is the establishment of a municipal (or community) emissions reduction target. Historically,

attempts at this have either resulted in very ambitious figures (such as 50% or 100% reduction within the space of a few years) or very modest figures (such as 5% over 20 years). However, the key problem with these targets is not with the specific value selected but with the way that the responsibility for achieving this target is communicated.

It is not effective for Council to take on responsibility for achieving community mitigation targets, because in most instances Council is not in a position to directly affect these emissions and it does not have the resources required to make the transition in the time required. From this understanding, the focus of engagement with the Bundaberg community is centred on:

- Setting a carbon emissions reduction target for Council's own corporate emissions
- Setting an action-derived emissions reduction target for Council's carbon emissions mitigation strategy, based on the expected emissions mitigation that is expected to be achieved from the plan.
- Setting a carbon emissions reduction target for the Bundaberg Region, for which Council will work with the overall community to realise these reductions. Council will play a key role in enabling the community to meet this target and commits to facilitating engagement between key stakeholders responsible for these emissions; to identify the most effective ways for the community to draw down their emissions; and be a key advocate where needed.

¹¹ <https://www.globalcovenantofmayors.org/wp-content/uploads/2018/05/Consultation-document-English.pdf>

