



Energy Savings Action Plan

August 2021



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Foreword from the Mayor

Lockhart Shire is home to a proud and prosperous community with a deep connection to the land. We are passionate about innovation and creating opportunities for economic growth within our region.

This ***Energy Savings Action Plan*** is part of Council's mission to provide leadership to the community and enhance the environmental, social and economic qualities of our Council.

This document builds on the work done as part of our 2017-2021 Operational Plan and maintains the objective of making Lockhart township 100% sufficient on renewable energy sources.

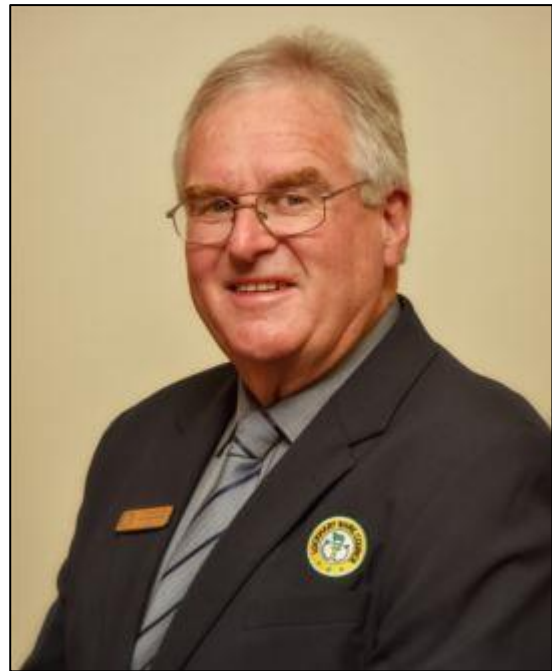
Council's primary focus is still to lower our costs of operation, and the projects identified in this plan will reduce electricity costs by 29%.

In addition, Council aims to:

- Utilise renewable energy to power our facilities.
- Improve our water resilience.
- Improve our energy resilience.

Council will invest in targeted energy infrastructure projects that will afford the greatest energy and cost savings.

By following the strategies outlined in this document, Council will take its next step towards achieving a lower cost and more sustainable energy mix.





1 Where We Are Now

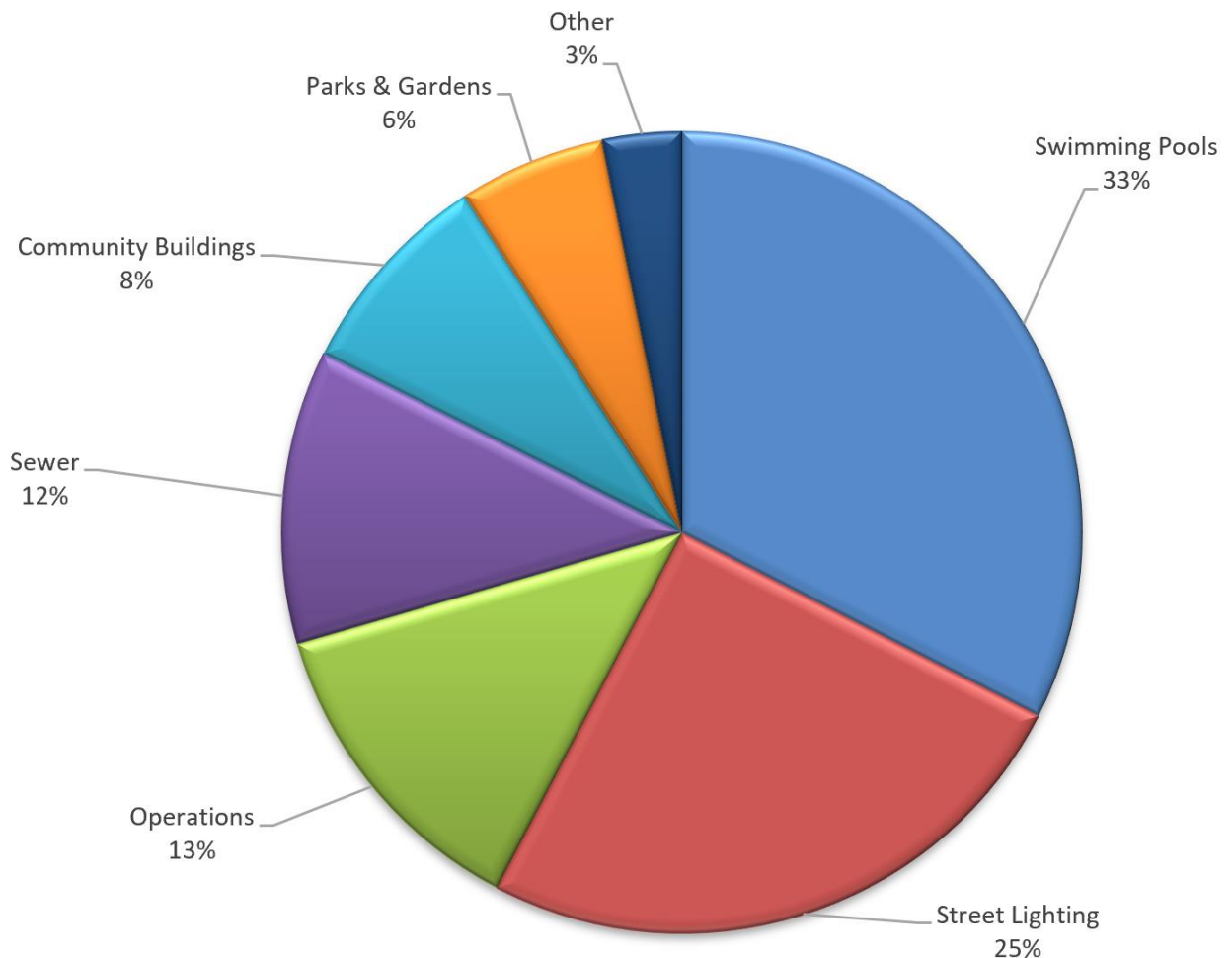
Lockhart Shire Council is home to approximately 3,300 residents across a Local Government Area (LGA) of 2,943 square kilometres.

Council's energy baseline is as follows:

- 617 MWh p.a. of electricity consumption.
- Annual electricity cost of \$152,427 across 34 sites (37 NMLs).
- 512 Tonnes of CO₂ per annum from electricity alone.

Council's electricity consumption is primarily:

- Swimming Pools (33%)
- Street Lighting (25%)
- Operations (Admin and Depot) (13%)
- Other (29%).



Council's largest energy users are the subject of this **Energy Savings Action Plan:**

- 67% of Council's energy use is from four sites.
- 84% of Council's energy use is from seven sites.
- 92% of Council's energy use is from ten sites.

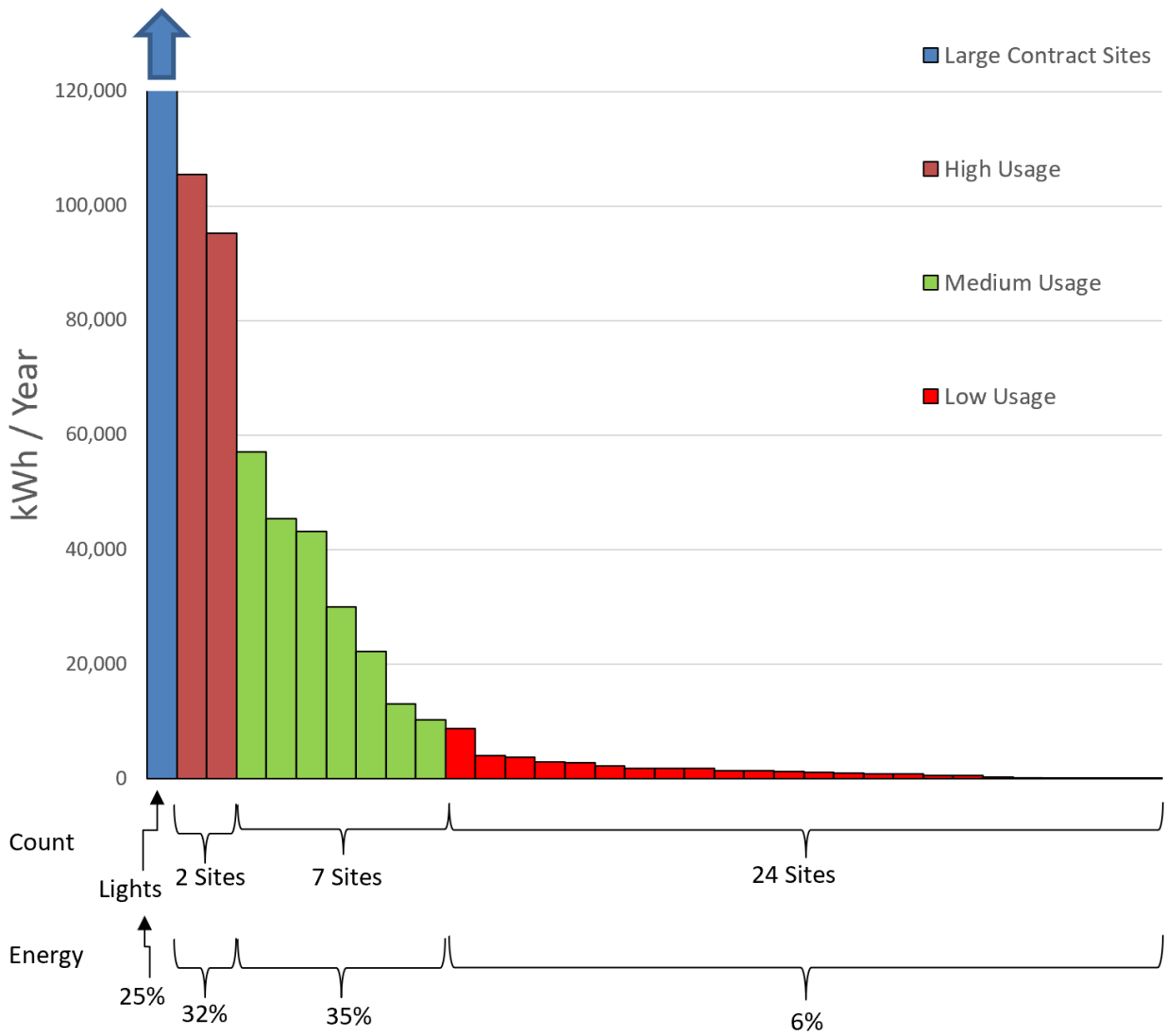


Figure 1: Histogram of site annual energy consumption

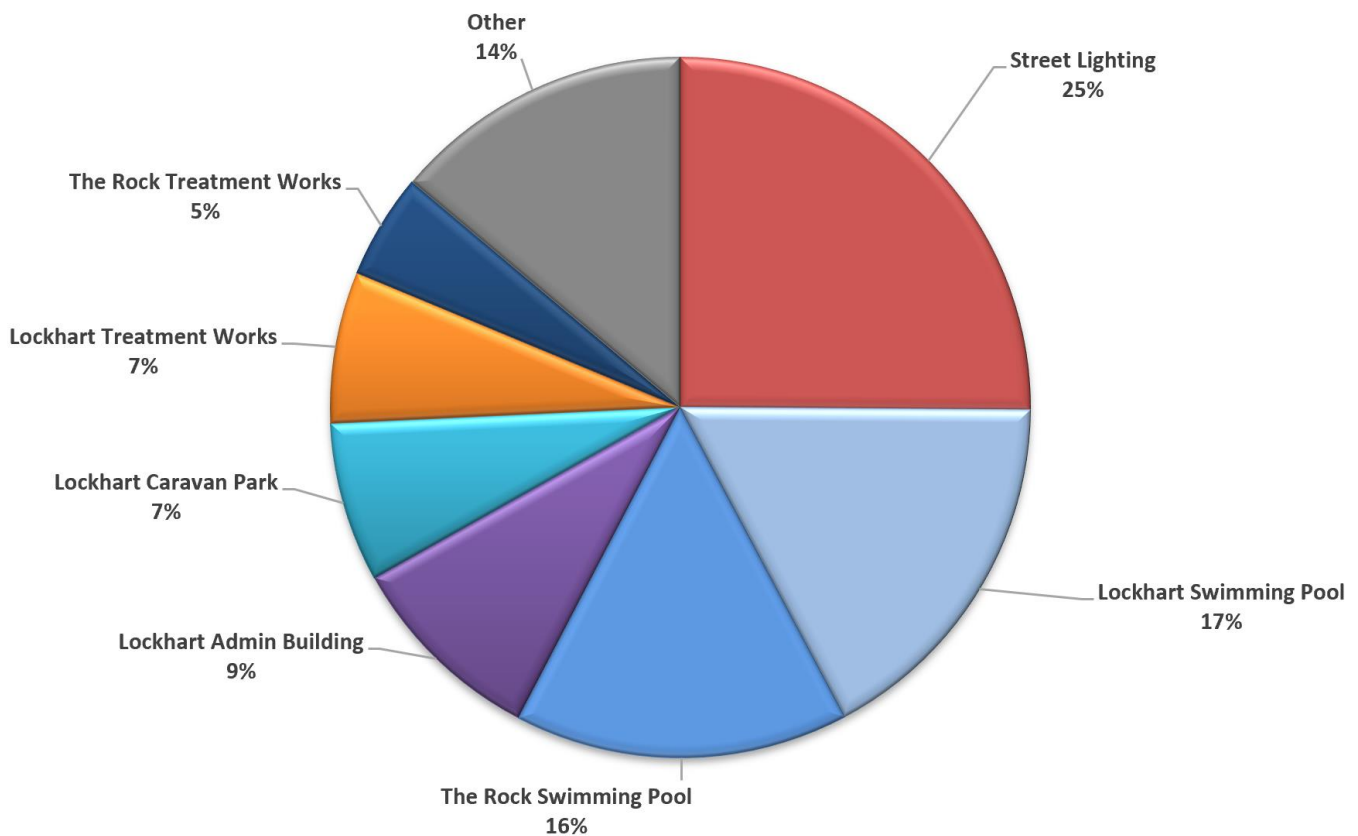


Figure 2: Council's seven largest energy users



2 Future Targets

By implementing the projects in this **Energy Savings Action Plan**, Lockhart Shire Council will strive to:

- Reduce energy costs by 29%.
- Reduce energy consumption by 31%.

Initiatives that will help achieve these targets include:

- Energy efficient lighting.
- Tariff optimisation & energy efficiency.
- Expanded solar PV program.

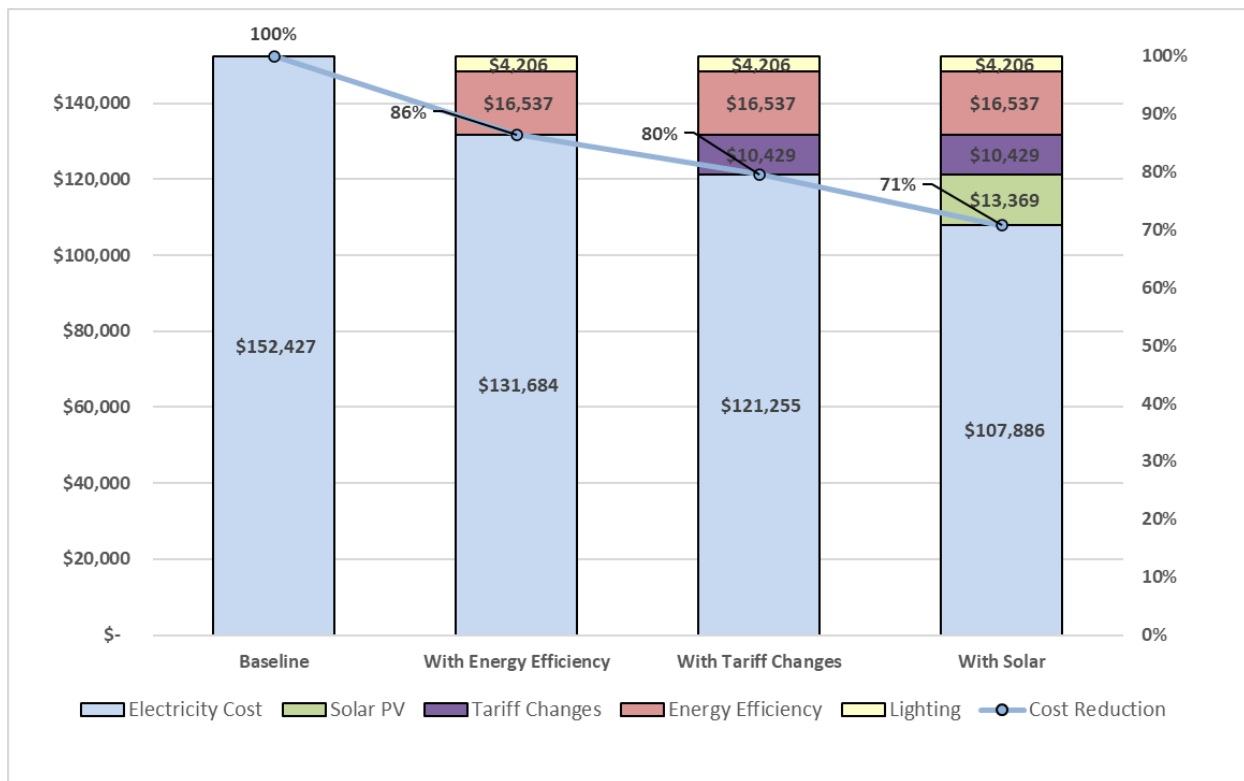


Figure 3: Cost reduction targets

These initiatives will enable Council to all but meet the NSW Government's 2030 emissions reduction target of 35% within 3 years.

Furthermore, the quantity of solar PV to be installed behind-the-meter will enable Council to achieve a 16% net renewable energy target.

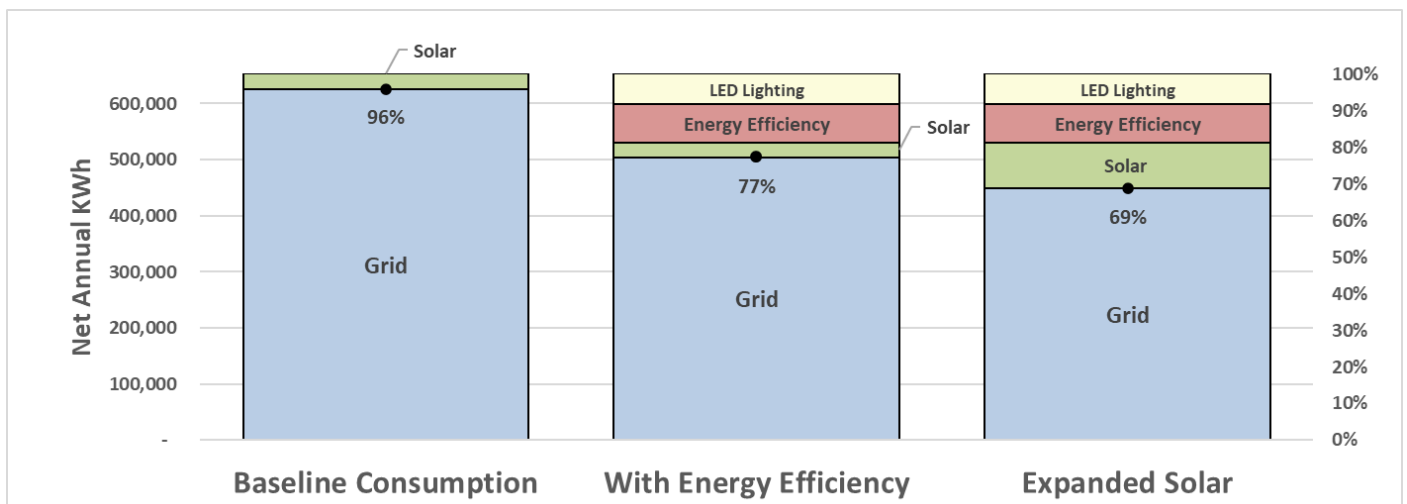


Figure 4: Energy reduction targets

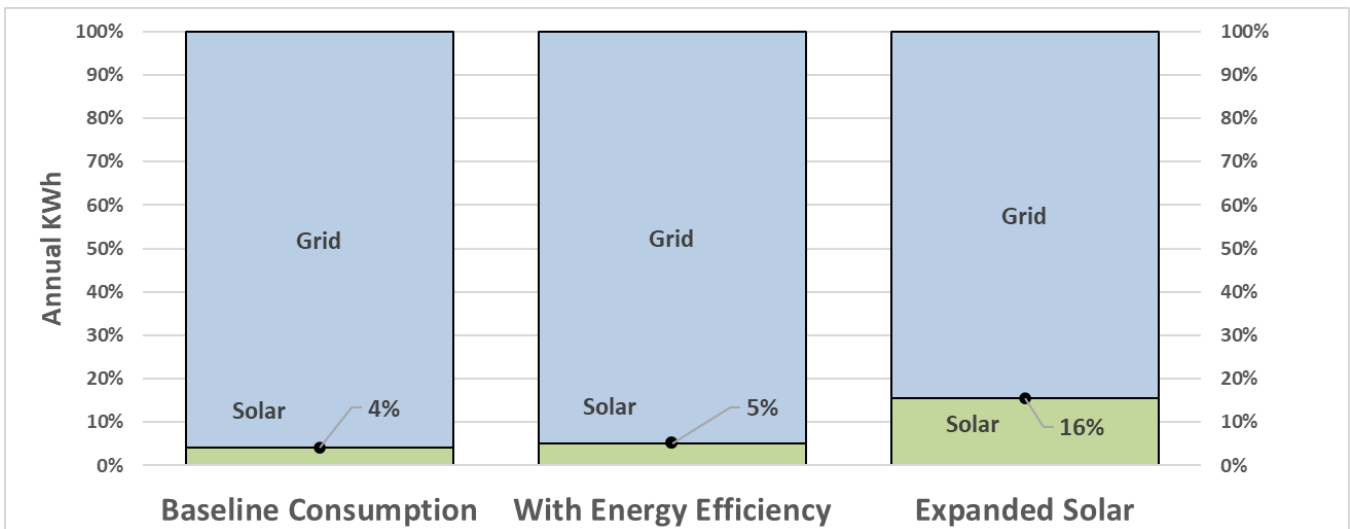


Figure 5: Net Renewable Energy Proportion

Council intends to target the remaining 84% of non-renewable electricity of its energy mix through power purchasing agreements to be negotiated through Riverina Eastern Regional Organisation of Councils (REROC) in our next energy contract or alternatively through the BET Lockhart Renewable Energy Project.

Summary of Savings

- Reduce electricity cost to Council by \$44,541 p.a. - a reduction of 29%.
- Reduce energy consumption by 31% by 2024, all but meeting the NSW government's 2030 target of 35%.
- Supply 16% of Council's electricity with self-generated renewable energy.



3 Actioned Energy Saving Projects

Council Administration Building

Council aims to lead by example by ensuring our administration building is sustainable and energy efficient.

Council has installed an 18kW solar PV system on the roof our administration building. This system generates approximately 27MWh of energy per year and offsets approximately 40% of the site's energy usage.

Council has also installed energy efficient LED lighting within the building to improve the working environment for our staff as well as lower our energy usage.

LEDs use approximately 50% the power of legacy technologies and have a longer operational life. This site also has two large rainwater tanks to reduce our dependence on the town's water supply.

LED Street Lighting

Lockhart Shire Council, as a member of REROC, has initiated the change of its legacy street lighting over to energy efficient LED technology.

This change is underway, but when completed will save Council approximately 93 MWh p.a. – approximately 15% of its overall energy consumption.

Essential Energy will maintain ownership of these LEDs and install them with no capital cost to Council. Council will pay back this cost through the annual energy savings.

This initiative will save Council between \$3,037 and \$4,206 per annum (after ESCs and SLUOS charges are applied).



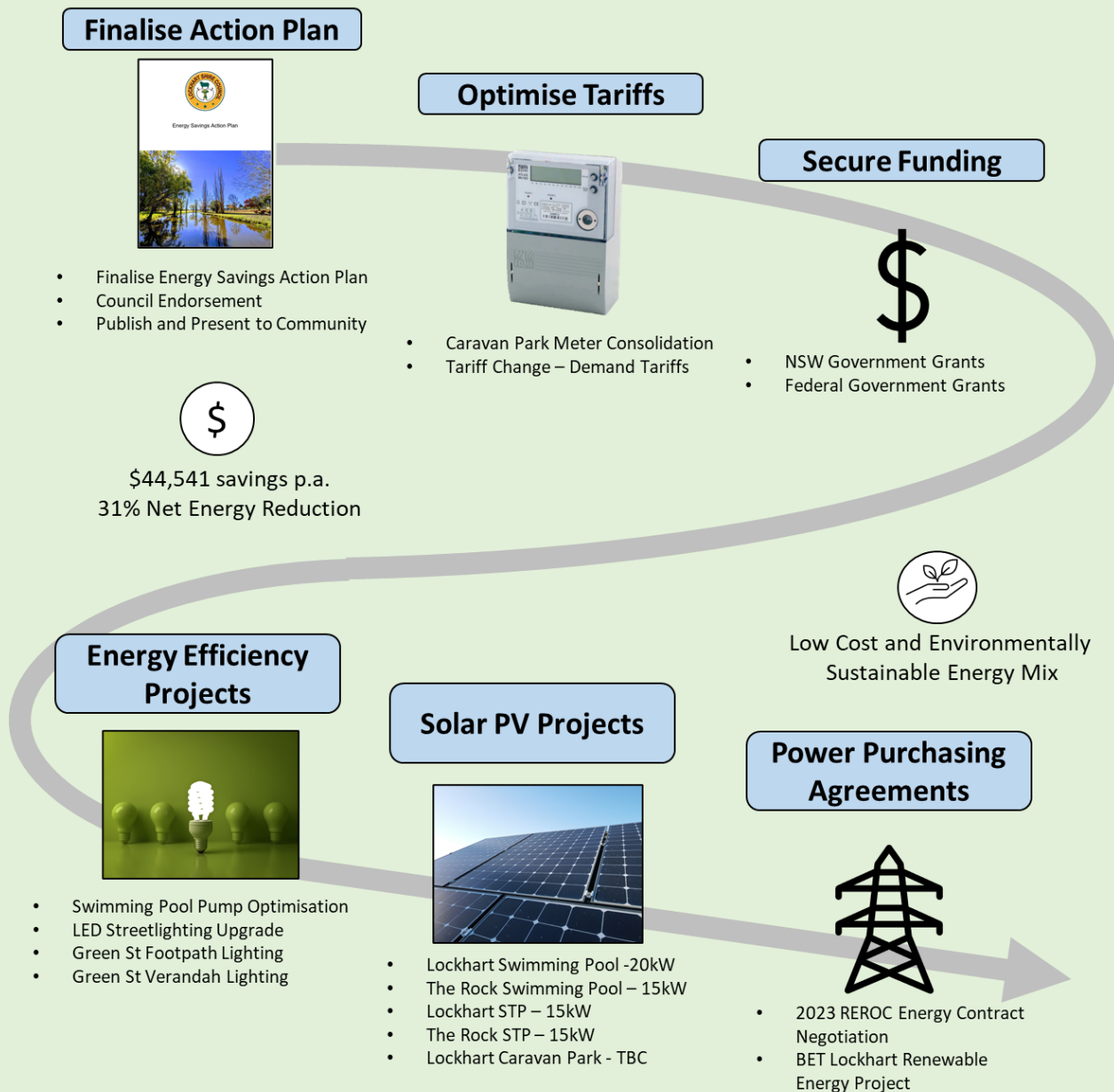


NO ENTRY
Unauthorized persons
prohibited

4 Energy Savings Action Plan

Council will implement this action plan first by targeting the “low hanging fruit” such as tariff optimisation, funding applications and completing the projects we have already initiated.

By leveraging these energy savings and funding streams Council will be well placed to initiate high impact energy efficiency and solar PV projects that directly benefit the community.



Key action items of this plan are listed below in section 4.1 with details provided in sections 5 – 7.

4.1 Implementation Steps

Action Item	Details	Progress Notes and Timeline
Energy Savings Action Plan		
Finalise Plan	Energy Savings Action Plan to be endorsed by Council	Document to be presented to Council 16 th August 2021
Collaborate with SCC	Work with Sustainable Councils and Communities Program (SCC) to enact implementation of action plan.	DPIE is providing ongoing consultation and support to help move this action plan towards implementation.
Tariff Optimisation		
Tariff Optimisation – Caravan Park	Consolidate caravan park onto one electricity meter	Main switchboard has been upgraded. Meter consolidation in progress.
Tariff Optimisation – Opt-in Demand Tariff	Apply for tariff change for 5 identified sites	Initiated with SCC appointed energy consultants.
Funding		
LRCI Funding	Council has been allocated \$1,613,922 for January 2022 as part of the Local Roads and Community Infrastructure Program.	Council to consider energy projects under this program.
Grant Funding	Monitor grant funding applications relevant to energy projects.	Liaise with REROC and SCC for funding application support.
Energy Efficiency		
LED Streetlighting Upgrade	Essential Energy to upgrade 250 streetlights to LED	In progress by Essential Energy
Green St Footpath Lighting	Install energy efficient footpath lighting	Requested by Lockhart Progress Association. Cost estimate received. To be completed ASAP in consultation with SCC appointed consultants.
Lockhart Verandah Lighting	Complete lighting on Green St verandahs. Consolidate lighting onto one meter.	To be completed in consultation with SCC appointed lighting specialists.
Lockhart and The Rock Swimming Pool	Engage pool specialist in collaboration with engineering consultant to optimise filtration process	To be completed by March 2022 (before pool shutdown)
Solar PV		
Lockhart Pool – 15kW	Install 15kW solar PV system on the roof of the amenities building.	Utilise Sustainable Councils and Communities Program for assistance in specification and procurement.
The Rock Pool – 15kW	Install 15kW solar PV system on the roof of the amenities building.	
Lockhart STP – 20kW	Install 20kW ground mounted solar PV system. Some tree clearing required.	
The Rock STP – 15kW	Install 15kW ground mounted solar PV system.	
Lockhart Caravan Park solar	Conduct feasibility study at completion of works. Possible locations include camp kitchen.	Liaise with SCC appointed engineering consultant.
Long Term Energy Planning		
Power Purchasing Agreements	Work with REROC to negotiate 100% renewable PPA. Monitor BET Lockhart Renewable Energy Project.	Consult with SCC for 2023 contract negotiation.

5 Targeted Energy Projects

5.1 Tariff Optimisation

Tariff optimisation is a zero-cost opportunity to achieve cost savings on energy.

In preparing this **Energy Savings Action Plan** the following tariff optimisation techniques were identified.

Lockhart Caravan Park

The caravan park in Lockhart has four NMIs (plus one controlled load meter). This arrangement results in four separate electricity bills, and in total the site pays \$1,650 per year in grid connection charges.

Consolidating the metering onto a single meter (plus controlled load) will save \$1,155 per year.

Council has upgraded the electrical infrastructure at this site and is in the process of consolidating the metering.

Council plans to assess the feasibility of solar PV at this site at the completion of works.

Opt-in Demand Tariffs

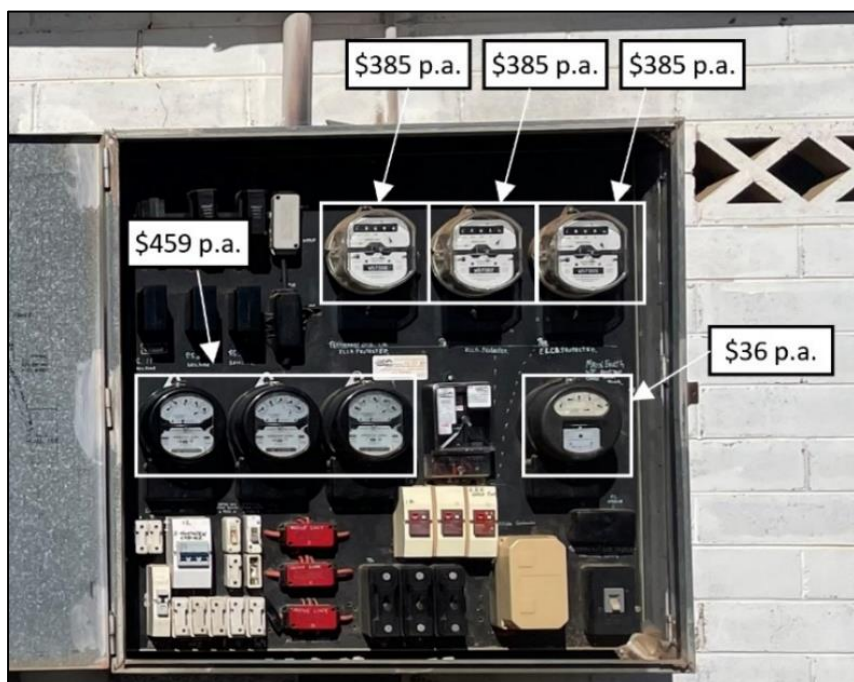
Council's large sites pay energy rates comparable to residential households but consume 10x more energy.

These sites fall just short of an automatic tariff change, but at Council's request can be shifted onto a more favourable tariff.

Installing interval metering will facilitate new tariffs that have much low energy-cost tariffs (with demand charges).

The energy audit conducted to prepare this plan has identified that these tariff optimisation initiatives could save Council up to \$13,785 p.a.

Refer Appendix 2 for further details.



5.2 Swimming Pools

Lockhart Swimming Pool

Lockhart swimming pool is Council's largest single energy user with 105MWh of annual consumption - 17% of total Council energy use.

The filtration system at this site is required to run all year round, however, the pool is only in operation from October – March. Council has identified this as an opportunity to reduce energy consumption over winter through a series of energy saving measures.

These include:

- Installing an automated controller to synchronise pumping with times of peak solar energy generation.
- Covering the pool to reducing filtering energy requirements.
- Reducing overall pump operation hours.

Council's target it to reduce winter energy consumption by 25%.

This will reduce the site's overall energy usage by 11% and save \$2,591 per year.

To further optimise this site, Council plans to install a 15kW solar PV system on the roof of the amenities building. Solar PV is expected to reduce the sites grid energy consumption by an additional 22% worth \$3,635 p.a.

Overall, these measures will reduce Council's total energy usage at this site by 35MWh p.a. and save Council \$6,226 per year.





The Rock Swimming Pool

The Rock swimming pool consumes a comparable 95MWh per year – 16% of Council's total energy usage.

Similarly to Lockhart, The Rock swimming pool requires water filtration all year round.

By implementing similar energy saving measures Council aims to reduce overall energy consumption by 11% saving Council \$2,194 per year.

The Rock swimming pool is also a candidate for a 15kW solar PV system. Based on past usage, solar at this site will see high utilisation worth \$3,426 per annum.

The combined measures will reduce Council's total energy consumption at the Rock swimming pool by 31MWh p.a. and save \$5,620 per year.

5.3 Sewage Treatment

Lockhart STP

Council plans to reduce energy costs and improve the resilience of its treatment plants.

Lockhart STP uses approximately 43MWh p.a. and is a candidate for a ground mounted 20kW solar PV system. This system will save \$3,605 in energy costs per annum.

As part of the associated electrical works Council plans to install a generator connection point. This will allow Council to run the plant using a backup generator in the event of power failure.

Tree clearing on the north side of the plant will improve solar output and help to address clogging issues in sludge ponds caused by falling leaf litter.



The Rock STP

The Rock STP is also a candidate for solar PV and generator backup.

Council plans to install a 15kW ground mounted solar PV system at this site to offset the consumption of the plant and the adjacent works depot.

A generator connection point will provide resilience to the plant in the event of power failure.

Solar at this site will save \$2,704 per annum.

These estimated savings of these four systems are **after** the recommended tariff changes are applied.

Further details are provided in Appendix 3.



6 Lighting Projects

Lockhart Verandah Lighting

Lockhart is proud of its reputation as “The Verandah Town” and Council is committed to maintaining the aesthetics of these verandahs.

Council plans to upgrade the ‘fairy lighting’ currently in place along Green St and introduce some energy and cost saving measures.

These include:

- Energy efficient LED lighting
- Meter and billing consolidation
- Improving the continuity of lighting and filling in any missing spaces.

This project will enhance the aesthetics of Lockhart’s main street and showcase our fantastic verandahs at all hours of the day.

Green St Footpath Lighting Upgrade

The Lockhart Progress Association has requested that Council upgrade the footpath lighting on Green St between Lockhart Caravan Park and the Visitor Information Centre (Corner of Green St and Urana St).

This section has significant amount of foliage and will require either bollard or up-lighting rather than conventional pole mounted down-lights. As part of this upgrade Council will ensure that efficient LED lights are selected with a long operation life.



Image: Spirit of The Land Lockhart

7 Power Purchasing Agreements



Lockhart Shire Council's Delivery Program 2017-2021 set about pursuing the objective of making the Lockhart township 100% self-sufficient on renewable energy sources.

Council is yet to achieve this milestone.

Many Councils in NSW, however, have been able to demonstrate 20%, 50% and even 100% renewable energy Power Purchasing Agreements (PPAs) at prices equal to or lower than equivalent 'black' grid power.

This opportunity is something that Lockhart Shire Council wishes to pursue, including options presented by the Lockhart Renewable Energy Project (refer below).

Lockhart Shire Council will look to work with REROC, and in cooperation with its other members, negotiate a low-cost renewable PPA.

Provided that energy rates are no greater than conventional electricity contracts, Council will support a 100% renewable PPA.

Council will, where possible, look to support 'locally grown' renewable energy in its procurement of a renewable PPA.

7.1 Lockhart Renewable Energy Project

In 2017 Council was approached by Better Energy Technology (BET) to pioneer the first 100% renewable energy project in Australia.

In 2019 Council was successful in receiving \$1million of funding support from the federal government to conduct a feasibility study and progress the design of the system.

In 2020 the project received development application approval and is set to be constructed over the coming years.

The project, funded by BET, will cost around \$20 million and will include:

- 10MW solar farm
- 25MWh battery

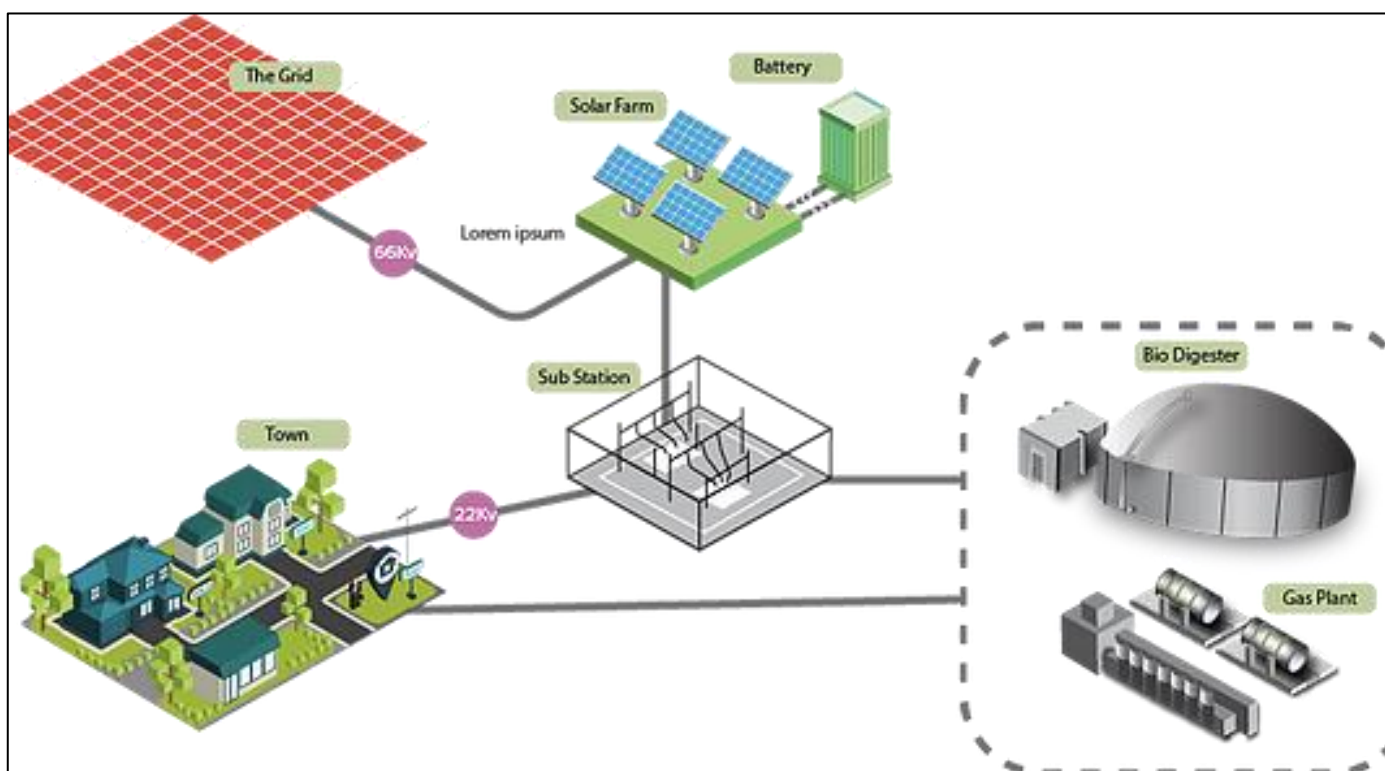
This combined system will have sufficient capacity to supply the whole of Lockhart and has the potential to reduce the energy costs to customers by up to 20%. Excess power will be exported to the grid to generate an income stream and underpin the project's financial feasibility.

The key outstanding item for this project is the link between energy generation and customers (including Lockhart Shire Council).

Prospective customers must engage with BET to 'sign up' with BET as their energy retailer. Proximity to the project does not automatically link energy being sourced from the Lockhart Renewable Energy Project.

Lockhart Shire Council encourages the BET project and is excited by the prospect of 100% renewable energy being supplied to the region.

Council's future commitment to participate as a customer of BET remains dependent on the successful completion of this project and the terms of the commercial offer presented by BET as Council's energy retailer.



8 Summary

The objectives of this **Energy Savings Action Plan** are aligned with Council's 2021-27 Community Strategy Plan and set a clear course for reducing our electricity costs.

The successful implementation of the target projects will allow Council to lower our cost of operations and fulfil Council's environmental, social, and economic commitments to our community.

The identified projects and initiatives will:

- Reduce energy consumption by 31%.
- Supply 16% of its electricity with self-generated renewable energy.
- Reduce electricity cost to Council by 29% compared to 2019 baseline (\$44,541)

To continue the transition of Lockhart township to 100% renewable energy, Council will look to leverage its partnership with RERO to secure a renewable energy power purchasing agreement.

The savings generated from the identified energy projects are to be reinvested into our community and in future energy saving projects.

The delivery of this plan will provide leadership to the community by demonstrating the energy savings that can be realised through targeted investment. Council will share the lessons learned from this program and support our constituents to realise their own energy savings.



9 Appendices

Appendix 1 – Tariff Recommendations

Council’s large sites pay energy rates comparable to residential households but consume 10x more energy. Council may apply to AGL to modify the electricity tariff structure for suitable sites. Instead of paying high rates for energy, these sites will have low rates but be subject to a peak demand charge component. This is known as a “Demand Tariff”. By shifting the sites identified below from a standard tariff to a demand tariff Council can lower the annual energy costs.

Category	Recommended Action	2021 Savings
High Usage Sites	Switch swimming pools to BLND1AB opt-in demand tariff	\$8,536
Medium Usage Sites	Switch to BLN1DAB opt-in demand tariff	\$6,205
Consolidate Meters	Switch 4 caravan park meters onto 1 meter. Change to BLND1AB opt-in demand tariff	\$2,891
Total Savings		\$17,631

Site	Site	NMI	Tariff	Annual Energy Consumption	Average Energy Rate	Total Energy Charges	Peak Demand	Peak Demand Rate	Total Demand Charges	Daily Charges Rate	Total Daily Charges	Other Charges	Existing Total	Proposed Total	Tariff Change Savings
High Usage Sites	The Rock Swimming Pool	4001307570	BLNT3AL (Existing)	95,304	0.19	\$ 17,933				\$ 1.08	\$ 393	\$ 318	\$ 18,644		
			BLND1AB (Proposed)	95,304	0.14	\$ 13,122	14	\$ 6.46	\$ 1,085	\$ 1.69	\$ 617	-\$ 222		\$ 14,602	\$ 4,042
	Lockhart Swimming Pool	4204196703	BLNT2AL (Existing)	105,515	0.19	\$ 19,671				\$ 1.69	\$ 617	\$ 94	\$ 20,382		
			BLND1AB (Proposed)	105,515	0.14	\$ 14,407	14	\$ 6.46	\$ 1,085	\$ 1.69	\$ 617	-\$ 221		\$ 15,888	\$ 4,494
Medium Usage Sites	The Rock Treatment Works	4204191676	BLNN1AU (Existing)	30,031	0.26	\$ 7,725			\$ -	\$ 1.04	\$ 378	\$ 101	\$ 8,205		
			BLND1AB (Proposed)	30,031	0.17	\$ 5,093	15	\$ 6.46	\$ 1,163	\$ 1.69	\$ 617	\$ 108		\$ 6,980	\$ 1,225
	Lockhart Treatment Works	4204196723	BLNN1AU (Existing)	43,131	0.26	\$ 11,095			\$ -	\$ 1.04	\$ 378	\$ 110	\$ 11,583		
			BLND1AB (Proposed)	43,131	0.17	\$ 7,315	15	\$ 6.46	\$ 1,163	\$ 1.69	\$ 617	\$ 117		\$ 9,211	\$ 2,372
	Lockhart Admin Building	4001232777	BLNN2AL (Existing)	57,089	0.22	\$ 12,640			\$ -	\$ 1.69	\$ 617	\$ 340	\$ 13,597		
			BLND1AB (Proposed)	57,089	0.15	\$ 8,802	17	\$ 6.46	\$ 1,318	\$ 1.69	\$ 617	\$ 252		\$ 10,989	\$ 2,608
Consolidate Meters	Caravan Park Site 1 (57306)	4204196359	Disconnect	6,841	0.22	\$ 1,491	-	-	\$ -	\$ 1.04	\$ 378	-\$ 26	\$ 1,843	\$ -	\$ 1,843
	Caravan Park Site 2 (57307)	4204196360	Disconnect	2,957	0.22	\$ 644	-	-	\$ -	\$ 1.04	\$ 378	-\$ 8	\$ 1,015	\$ -	\$ 1,015
	Caravan Park Site 3 (57305)	4204196361	Disconnect	203	0.22	\$ 44	-	-	\$ -	\$ 1.04	\$ 378	\$ 4	\$ 427	\$ -	\$ 427
	Caravan Park	4204196362	BLNN1AU (Existing)	35,401	0.26	\$ 9,107	-	-	\$ -	\$ 1.04	\$ 378	\$ 104	\$ 9,589		
BLND1AB (Proposed)			45,401	0.17	\$ 7,700	20	\$ 6.46	\$ 1,550	\$ 1.69	\$ 617	\$ 116		\$ 9,983	-\$ 393	
															\$ 17,632

Appendix 2 – Behind-the-Meter Solar PV

Site	Size (kW)	Site Annual Consumption*	Annual Generation	Net Zero	Annual Savings**	Capital Cost	Simple Payback	CO ₂ Reduction
Immediate Solar PV projects								
Lockhart Swimming Pool	15kW	93.3 MWh	22.6 MWh	24%	\$3,605	\$12,500	3.5 years	18.2 T
The Rock Swimming Pool	15kW	84.9 MWh	22.6 MWh	27%	\$3,426	\$12,500	3.6 years	18.2 T
Lockhart STP	20kW	43.1 MWh	30.2 MWh	70%	\$3,605	\$20,000	5.4 years	24.3 T
The Rock STP	15kW	30.0 MWh	22.6 MWh	75%	\$2,704	\$15,000	5.5 years	18.2 T
Total	65kW	251.3 MWh	98.0 MWh	39%	\$13,340	\$60,000	4.5 years	78.9 T

*Including pool energy savings in winter.

**After tariff change recommendations applied.

Lockhart Pool – Solar PV Installation Recommendations

Lockhart Pool has two separate electricity meters, one for the pump room and one for the amenities building. The solar PV is to be connected to the pump room meter however there is no available space on the pump room roof. Council plans to install panels on the roof of the amenities building, which has space available, and run DC cabling in a trench (approximately 50m) back to the pump room meter.

