Released 27 January 2026

ADELAIDE HILLS COUNCIL
ORDINARY COUNCIL MEETING
Tuesday 12 November 2024
CONFIDENTIAL AGENDA BUSINESS ITEM

Item:	**19.1.**
Responsible Officer:	**David Waters** **Director Environment and Infrastructure** **Environment and Infrastructure**
Subject:	**Community Renewables Program**
For:	**Decision**

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1. Community Renewables Program – Exclusion of the Public

Pursuant to section 90(2) of the *Local Government Act 1999* the Council orders that all members of the public, except:

- **Chief Executive Officer, Greg Georgopoulos**
- **Director Environment and Infrastructure, David Waters**
- **Director Corporate Services, Gary Lewis**
- **Director Community & Development, Jess Charlton**
- **Executive Governance Officer, Zoë Gill**
- **Minute Secretary, Rebekah Lyons**
- **IT Support, Tom Portas**

be excluded from attendance at the meeting for Agenda Item 19.1: (Community Renewables Program) in confidence.

The Council is satisfied that it is necessary that the public, with the exception of Council staff in attendance as specified above, be excluded to enable Council to consider the report at the meeting on the following grounds:

Section 90(3) of the *Local Government Act 1999*, the information to be received, discussed or considered in relation to this Agenda Item is as follows:

(d) commercial information of a confidential nature (not being a trade secret) the disclosure of which –

(i) could reasonably be expected to prejudice the commercial position of the person who supplied the information, or to confer a commercial advantage on a third party; and

(ii) would, on balance, be contrary to the public interest.

(h) legal advice;

Accordingly, on this basis the principle that meetings of the Council should be conducted in a place open to the public has been outweighed by the need to keep the information and discussion confidential.

2. Community Renewables Program– Confidential Item

SUMMARY

The purpose of this report is to provide Council with three options for a Community Renewables Program for the Adelaide Hills community. These options have been informed by a Cost and Emissions Analysis undertaken by Dsquared Consulting (see ***Appendix 1***).

The three options are:

Option 1 - AHC Bespoke Community Renewables Program: Developing a local bulk-buy solar and home battery program designed to suit the Adelaide Hills market.

Option 2 – City of Mitcham/ShineHub Community Renewables Program: Entering into an arrangement directly with ShineHub utilising the City of Mitcham framework.

Option 3 – Corporate and Community Carbon Management Plan: Developing a community emissions reduction program based on the Corporate and Community Carbon Management Plan currently in development.

RECOMMENDATION

Council resolves:

1. That the report be received and noted.

2. **For Council decision (see *options* section of the report).**

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1. BACKGROUND

At its meeting held on 26 March 2024, Council considered a motion on notice from Cr Nathan Daniell regarding the City of Mitcham's Community Renewables Framework. Following consideration of the matter, the Council resolved as follows:

11.2 Investigating the merits of a Community Renewables Program based on the success at City of Mitcham – Acting Mayor Nathan Daniell

Moved Cr Nathan Daniell
S/- Cr Melanie Selwood **84/24**

That:

1. **The CEO provide a report to Council by 30 June 2024 that investigates collaborating with the City of Mitcham to use their Community Renewables Framework, due diligence and tender results to implement a similar bulk buy and Virtual Power Plant (VPP) program, but tailored to meet the requirements of Adelaide Hills Council and our community.**

2. **That the CEO request a briefing for Elected Members and relevant staff by the City of Mitcham to understand the community, environmental, and economic benefits achieved from the implementation of their program.**

3. **That the prior to entering into its next electricity agreement, investigates an innovative 100% Renewable Energy Power Purchase Agreement (PPA) or similar for Council's future energy needs, including the opportunity to integrate a VPP and community batteries.**

Carried

In accordance with point 2 of the resolution, Council received a presentation from the City of Mitcham's Group Manager, Mr Matt Romaine, on 3 June 2024. Mr Romaine provided information on the City of Mitcham's approach, stakeholders involved, due diligence, the roll out and costs.

Point 3 of the resolution will be the subject of a separate report to be prepared for Council on Power Purchase Agreement options.

At a Council meeting held on 23 July 2024, a report addressing point 1 was provided for Council consideration, recommending more time for the Administration to obtain the necessary information. The Council resolved as follows:

ADELAIDE HILLS COUNCIL
MINUTES OF ORDINARY COUNCIL MEETING
TUESDAY 23 July 2024
63 MT BARKER ROAD STIRLING

12.5 Community Renewables Program

Moved Cr Nathan Daniell
S/- Cr Kirsty Parkin **263/24**

Council resolves:

1. **That the report be received and noted.**
2. **To note the City of Mitcham's Community Renewable Framework and thanks Mr Matt Romaine, Group Manager City of Mitcham, for his presentation on Monday 3 June 2024.**
3. **That a further report on the Community Renewal Program tailored to the Adelaide Hills Council and Community be provided to Council by no later than 12 November 2024.**
4. **That this report include:**
   a) **Options for the establishment of an Adelaide Hills 'Community Renewables Program'**
   b) **Options for the development of a Virtual Power Plant.**
   c) **A cost-benefit analysis completed for any options presented to Council.**

Carried Unanimously

This report is in response to point 3 of the above resolution.

There are two primary options to establish an Adelaide Hills Community Renewables Program, as well as a third option to not embark on a community renewable program at this time. This report refers to these three options which are broadly described below.

Option 1 - AHC Bespoke Community Renewables Program: Developing a local bulk-buy program designed to suit the Adelaide Hills market. This may include solar panels and home batteries with VPP participation but could also include other options that the market providers propose. The key outcome of this option is helping the community obtain more affordable access to renewable energy.

Option 2 – City of Mitcham/ShineHub Community Renewables Program: Entering into an arrangement directly with ShineHub utilising the City of Mitcham framework. This program is based on community bulk-buy campaigns for solar panels and home batteries, with optional VPP participation. The key outcome of this option is helping the community obtain more affordable access to renewable energy.

Option 3 – Corporate and Community Carbon Management Plan: Developing a community emissions reduction program based on the Corporate and Community Carbon Management Plan currently in development. This includes considering a program that addresses other high carbon emission areas such as agriculture and transport, as well as electrifying activities that are currently powered by non-renewable energy. The key outcome of this option is helping the community reduce carbon emissions.

City of Mitcham/ShineHub Community Renewables Framework

The City of Mitcham has developed a 'Community Solar Program' aimed at offering renewable energy options to its community. The Program includes facilitating a bulk buy purchase of solar panels and batteries for homes and businesses, and integrating these elements into a VPP.

The process to develop the program commenced in 2021 and went through the following key steps:

- Release of an Expression of Interest requesting proposals from suitable providers to assist the City of Mitcham with reducing community carbon emissions, lowering energy costs and to leverage the community's trust in the council as a collaborative partner.

- Allocation of a one-off operating budget of approximately $87,000, in addition to staff costs, to obtain advice on aspects including legal implications, SA Power Networks support, renewable energy expertise, competitive neutrality implications, due diligence and prudential review and advice from the LGA's Mutual Liability Scheme.

- Consideration and endorsement of the process by the Audit Committee.

- Evaluation of proposals and shortlisting, with the eventual appointment of Shinehub as the preferred partner, under a formal heads of agreement.

ShineHub was assessed as being able to deliver the desired outcomes, demonstrated financial sustainability and had the necessary experience and experience to provide the City of Mitcham with confidence that it would make a suitable delivery partner for the program. ShineHub sold and installed solar panels and batteries, had experience running virtual power plants and were the holders of an energy retail licence.

The program commenced in 2021 and has been implemented through a number of bulk buy 'campaigns'. As part of this partnership a virtual power plant (VPP) has been incorporated in options available to consumers.

The City of Micham's approach is what is known as 'white labelling', that is, where the role of Council is limited to providing support for a project by attaching its brand to add credibility, including using social media, website, and community outreach to raise awareness of the program. The City of Mitcham found that this approach provided a level of assurance to residents that ShineHub was a reputable provider and simplified the choice of solar and battery installer for the community. In essence, the success of the scheme relied on the community having trust in the City of Mitcham's recommendation of a supplier of solar panels and batteries.

The Program offering to the City of Mitcham community includes:

- Outright upfront purchase – residents may purchase either a solar and/or battery system at discounted prices through the bulk buy.

- No upfront cost option – this is described as the 'subscription' model whereby ShineHub provide a solar and battery system with the resident paying a monthly subscription. The subscription lasts for 10 years. During this time ShineHub owns and maintains the system. The resident can purchase the system for $1 after 10 years or buy-out at any time.

- Virtual power plant add-on – The VPP is a system whereby ShineHub can remotely control all the batteries which are part of the VPP and direct them to provide energy to the electricity grid at a time of their choosing. This enables ShineHub to effectively sell power from the batteries to the grid during periods of high electricity demand and take advantage of favourable wholesale spot prices. Battery owners get a return, as does ShineHub. The City of Mitcham also obtains a payment under commercial terms with ShineHub.

The City of Mitcham's Community Renewables Program has thus far been considered a success for both the organisation and the community, resulting in emissions and overall energy cost reduction.

Community Renewables Program Status for other Councils

The City of Charles Sturt, Campbelltown City Council, City of Unley and the City of Marion have already endorsed replicating the City of Mitcham program, partnering direct with Shine Hub and are at varying stages of the process. The City of Charles Sturt is the most progressed, having recently held their first bulk buy campaigns which have been fully subscribed.

The City of Burnside will develop a community renewables program by making its own approach to the market to determine which suppliers could provide a similar program. The City of Burnside decided on this approach due to the following:

- There has been a few years since the City of Mitcham undertook their market process and it was timely to reconsider and test the approach and market.
- There are other suppliers in the bulk buy and VPP market and an open tender process would test this and provide others with the opportunity.
- ShineHub is located in NSW and they wanted consideration of more local content in the program.

Other councils including the Town of Gawler, the City of Onkaparinga and the City of Holdfast Bay are also understood to be investigating the opportunity.

AHC Carbon Management Plan

The new Carbon Management Plan (CMP) incorporating corporate and community emissions is currently under development. Council Member workshops were held on Tuesday 16 April and Monday 5 August 2024 to identify and discuss opportunities for inclusion in the CMP.

The CMP is focused on initiatives which reduce carbon emissions. As discussed elsewhere in this report, a community renewables scheme (either the City of Mitcham scheme or a bespoke Adelaide Hills Council option) will not make significant gains in community carbon emission reduction given the SA electricity grid is rapidly becoming supplied with entirely renewable energy.

A community focus group was formed to provide input into the final development stage of the CMP. Meetings of the focus group were held on 25 September 2024 and 16 October 2024. The focus group consisted of fifteen community members, who registered their interest through an online registration process.

As part of the focus group sessions, participants were asked how they felt Council could best support them to reduce carbon emissions. Ideas included:

- Conducting public education and community workshops on sustainable living practices
- Facilitating community bulk buy for items supporting electrification and sustainable living, such as electric vehicles, E-bikes, electric cooktops, composting infrastructure and eco-nappies
- Providing small grants for community groups and individuals to take actions specifically addressing carbon emissions
- Advocating for better access to public transport and investing in facilities to make public transport more wet-weather friendly
- Providing incentives for all electric transition – e.g. taking people off gas and wood burning for heating and cooking
- Facilitating co-working opportunities to reduce the need for commuting.

South Australian Government Emission Targets

The Government of South Australia declared a climate emergency in May 2022 and committed to restoring a safe climate by transforming the economy to net zero emissions.

The South Australian Government has statewide goals of:

- Reducing greenhouse gas emissions by more than 50% below 2005 levels by 2030
- Achieving net zero emissions by 2050
- Achieve 100% net renewable electricity generation by 2027

South Australia is now on target to have net renewable electricity generation by 2027. Therefore, the energy from the grid will be fully renewable and not have carbon emissions directly attributable. As the South Australian electricity grid transitions to be fully supplied with renewable energy, the emphasis on electricity supply to homes evolves to being less about reducing the carbon footprint and more about affordability and reducing the cost of living.

2. ANALYSIS

➢ Strategic Management Plan/Functional Strategy/Council Policy Alignment

Strategic Plan 2020-24 – A brighter future

Goal	A functional Built Environment
Objective B3	Consider external influences in our long-term asset management and adaptation planning

Priority B3.2	Aim to achieve 100% renewable energy use for our corporate operations and strive towards carbon neutrality
Goal	Community Wellbeing
Objective C3	A community that grows together
Priority C3.4	Build partnerships with community and other stakeholders to enhance our capacity to provide and support opportunities for them to thrive

Priority B3.2 has been partially achieved as the Council currently purchases 100% renewable energy through the Green Power program. The new Carbon Management Plan is expected to outline a plan for the Council to achieve net zero carbon emissions by a date to be set, as well as actions for supporting the community to reduce carbon emissions.

- **Legal Implications**

If Council decides to progress wth the City of Mitcham Community Renewables Framework and engage ShineHub to undertake a Community Renewables Program the *Local Government Act 1999* and Council's Procurement Policy determines the approach and process that Council is required to undertake.

Relevant sections of the Act include:

- section 36(1)(a)(i) General Powers and Capacity which provides that the Council has the legal capacity to *'enter into any kind of contract or arrangement'*. and
- section 49(2)(c) Contracts and tenders policies which stipulates that the Council does not need to undertake a tender process each time it enters into a contract for goods and services.

Legal advice has suggested Council can proceed with directly engaging ShineHub to implement and manage the Community Renewables Program. The legal advice identifies the need for an exemption and waiver to a Council-specific competitive process which would need to be the subject of a Council resolution to adopt the procurement process undertaken by the City of Mitcham as being sufficient for Council's procurement purposes. The Council should record its reasons and formally adopt that position by Council resolution. Further legal advice will be required on the proposed Deed of Agreement to ensure that the liability risk for Council is minimised and is considered a critical consideration as part of Council's due diligence processes.

- **Risk Management Implications**

If Council decides that it would like to progress with a Community Renewables Program regardless of which approach Council may choose there will be legal, financial, procurement or reputational risks associated with this type of program.

For example, risks associated with the roll out of a Community Renewables Program include reputational risk associated with Council endorsing a particular provider, the products and promoting them to the community. If there is any kind of default on the part of the provider, or shortcoming in the expected service, residents may seek to hold Council to account. The analysis undertaken by Council's consultant, dsquared, contained in ***Appendix 1***, provides an indication of the likely benefits to consumers compared with the promoted benefits.

At the same time, there is some risk of criticism of Council if it does not provide an offering to its community similar to the one promoted by the City of Mitcham and other councils which are looking to do likewise. It is difficult to assess that risk as the impact and extent of that criticism is unknown.

Particular risks addressed by each option are described below.

Option 1 - AHC Bespoke Community Renewables Program:

The design and implementation of a Community Renewables Program specifically for the Adelaide Hills through an independent tender process will assist in mitigating the risk of:

Endorsing a single provider leading to foregoing a better offer and arrangement. other local solar and battery businesses.

Inherent Risk	Residual Risk	Target Risk
Medium 3C	Medium 2C	Low 2D

Option 2 – City of Mitcham/ShineHub Community Renewables Program:

The implementation of the City of Mitcham and Shine Hub Community Renewables Program will assist in mitigating the risk of:

Not supporting the community reduce carbon emissions and cost of living leading to unsatisfied community and reputational consequences.

Inherent Risk	Residual Risk	Target Risk
Medium 3C	Medium 2C	Low 2D

The implementation of the City of Mitcham and Shine Hub Community Renewables Programs will assist in mitigating the risk of:

Undertaking a complex and independent tender process leading to the need for increased resources, budget and timeframe for implementation.

Inherent Risk	Residual Risk	Target Risk
Medium 3C	Low 2D	Low 2D

Option 3 – Corporate and Community Carbon Management Plan:

Incorporating a community emissions reduction program in the development of the Carbon Management Plan will assist in mitigating the risk of:

implementing a Community Renewables Program in isolation of other carbon emission reduction opportunities that may be identified within the Carbon Management Plan leading to potentially forgoing the greatest community carbon emission reduction opportunity.

Inherent Risk	Residual Risk	Target Risk
Medium 3c	Medium 3C	Low 2D

The mitigation actions will vary depending on what option is progressed.

Legal advice has been sought to better understand the risk of proceeding to engage one provider and the Cost and Emissions Analysis provides up to date information on the City of Mitcham and ShineHub approach and the implications for the community.

- **Financial and Resource Implications**

There are financial and resource implications for implementing a Community Renewables Program particularly in ensuring that the process is appropriate from a legal and probity perspective and that there are adequate resources to manage the process. Indicative costs are provided below based on the experiences of other councils (other than the City of Mitcham) which have implemented a Community Renewables Program.

Option 1 - AHC Bespoke Community Renewables Program

If Council undertook its own approach to market to develop a Community Renewables Program specifically for the Adelaide Hills community, this would include a comprehensive tender process and would likely involve 1 FTE Project Officer (approx. $120,000) in the initial year. Depending on the project timing and implementation this may be extended beyond the initial year. This role would undertake activities relating to project management, marketing, promotion, community engagement, procurement, stakeholder management and preparing progress reports. Further, there would be expenditure of approximately $60,000-$80,000 to undertake further due diligence, legal, procurement, governance and financial frameworks. There would need to be involvement of the existing Council services and functions of procurement, finance, communications, governance, risk, customer services and sustainability. There is currently no budget allocation for this resource.

In total, operating funding of up to $200,000 is required to implement Option 1 in the first year. Second year costs would likely be in the order of $150,000. Each subsequent year thereafter would depend on the required effort to sustain the program, but may be in the order of $75,000 per year.

Option 2 – City of Mitcham/ShineHub Community Renewables Program

This option is to collaborate with the City of Mitcham to use their Community Renewables Framework to develop a Community Renewables Program. This option requires legal, procurement, financial and governance review of the Community Renewables Framework and the implications for Council. $17,000 has been spent in recent months in legal and consulting costs of evaluating this option.

If Council resolves to progress with the City of Mitcham and ShineHub option, then additional resources would be required to facilitate this outcome. A part time Project Officer would be required for the initial year at a cost of approximately $60,000 to enable the Program to be developed. This role would undertake activities relating to project coordination, marketing, promotion, and preparing progress reports. There would need to be involvement of the existing Council services and functions of procurement, finance, communications, governance, risk, customer services and sustainability. In addition a further legal review of the Deed of Agreement and a financial review of Shine Hub in line with procurement practises is advised. This would require $10,000-$20,000.

In total, funding of up to $97,000 in the first year is required to implement Option 2. Second year costs would likely be in the order of $70,000 (comprising staff member and marketing costs). One could expect subsequent years to have a similar order of cost, gradually reducing as demand for the program wanes, i.e. once those consumers likely to take up the opportunity have done so.

It should be noted that, depending on the program parameters and the level of community uptake, the Council could enter into a revenue share scheme partnership which provides a financial return to the Council (likely after the first year) through the implementation of the Virtual Power Plant. Council staff have received an indication that Council could potentially enter into an arrangement with ShineHub to receive 15% of Shinehub's revenue share from VPP energy sales. At this point it is difficult to estimate with any degree of certainty what that revenue might amount to and therefore it is considered that this should not be considered a main driver in Council's decision making at this time. It might also be reasonable to assume that any financial benefit (or commission) paid to the Council would be built into the cost for consumers.

Option 3 – Corporate and Community Carbon Management Plan

The costs associated with this option would be finalised as the Carbon Management Plan itself is finalised over the coming months. At this stage, the Administration anticipates that based on the Council's draft Strategic Plan and preliminary directions in the Carbon Management Plan, it would be necessary to have a full-time resource working directly on programs supporting community sustainability initiatives and is working on ways to reprioritise resourcing to enable this without additional cost to the staffing budget.

As mentioned earlier in this report, a number of ideas have been raised by the community. Activities such as these could be undertaken within the limits of Council's desired level of investment.

- **Customer Service and Community/Cultural Implications**

The community would likely welcome any initiative which provides more affordable access to renewable energy. To that end, it is important that if Council is to run or support any particular scheme, the scheme must provide genuine benefits to the community, the delivery partner must be trustworthy and the product/s must have longevity.

Through the CMP development, community members have expressed a range of areas where they feel the Council could support community carbon emissions reductions, other than through a community renewable energy scheme. Council Members should take this into consideration when deciding on the best investment of Council funds.

- **Sustainability Implications**

The delivery of a Community Renewables Program is focussed on assisting the community to make renewable electricity choices. With the decarbonisation of the South Australian electricity supply and grid the reduction in carbon emissions from the Community Renewables Program will decrease over time. With the South Australian target of net renewable electricity generation by 2027 the Community Renewables Program is more about reducing the cost of living and electricity costs for participants and less about reducing carbon emissions.

There may be some carbon emission benefit through a scheme which provides more affordable access to electricity as this may incentivise people to utilise electricity in place of other energy sources (such as gas or wood burning) for things like home heating and cooking.

The development of the new CMP actions and opportunities will continue to reinforce and emphasise reducing carbon emissions. As the majority of the community's carbon emissions is from transport this is likely to be the focus of the CMP and therefore may be the greatest opportunity for Council to influence a reduction in community emissions.

- **Engagement/Consultation conducted in the development of the report**

Consultation on the development of this report was as follows:

Council Committees:	Not Applicable
Council Workshops:	Tuesday 1 October 2024 presentation with Dsquared Consulting to present options and advice received
Advisory Groups:	Not Applicable
External Agencies:	City of Campbelltown City of Unley City of Burnside City of Mitcham ShineHub
Community:	Not Applicable

- **Additional Analysis**

Council Members are referred to the report developed by consultant dsquared, contained in ***Appendix 1***, for comprehensive information about the options considered for the development of an Adelaide Hills Council Community Renewables Program, incorporating a VPP. A summary of costs and benefits is provided below.

	Option 1 – Bespoke AHC renewables program	**Option 2 – Shinehub bulk buy**	**Option 3 – other, based on CMP**
Societal benefits	• Provides easier choice for consumers	• Provides easier choice for consumers	• Can be targeted to community needs based on feedback and data
Economic benefits	• More affordable access to renewable energy and/or other products offered. Could specify local delivery partners	• More affordable access to renewable energy	• Economic benefits depend on program
Environmental benefits	• Relatively higher	• Relatively low as the program is focussed on reducing reliance on grid	• Potentially highest if targeted appropriately
Risks	• Availability of options particularly	• Provider and product not meeting consumer	• Program not meeting consumer

	suited to AHC consumers • Low uptake, mitigated by tailored offering	expectations (actual benefit lower than promoted benefit) • Low uptake	needs or preferences
Implementation	• Increased complexity and resource requirements • Longer start up time	• Lower complexity and resource requirements • Short start up time	• Start up time depends on program, but likely mid-range start up time
Cost considerations	• Highest	• Lowest	• Cost depends on program, but could be designed to meet budget (say medium cost option)
Cost (year 1)	$200,000	$97,000	$90,000
Cost (year 2)	$150,000	$70,000	$90,000
Cost (subsequent years)	$75,000	$70,000	$90,000
Summary considerations	Going to market may garner offerings of greater benefit to Council and the community than the ShineHub option. This option is however more complex, requires more start-up effort and greater cost. There is a longer lead time to provide a public offering.	The ShineHub option provides an 'off the shelf' and relatively easy to implement program. The primary risk is whether consumers in the Adelaide Hills will receive the promoted benefits, particularly given the lower solar radiation exposure of rooftops (typically) in the Adelaide Hills due to topography, vegetation and cloud cover compared with urban areas. It would be important to manage reputational risks to Council by working with the provider to ensure the offering accurately reflects likely benefits and pay back periods.	This options involves a focus on initiatives other than more affordable access to renewable energy and provides an opportunity for Council to support its community in reducing carbon emissions relating to transport, agriculture and other areas. Whereas community renewable energy schemes have relatively low environmental benefits (given the SA electricity grid is nearing net renewable), this option is the one most likely to provide greatest environmental benefit.

<u>A community emissions reduction program based on the Carbon Management Plan</u>

The Corporate Carbon Management Plan is now being reviewed and at an initial Council Workshop held in August 2023, a high level of interest was expressed in incorporating community emissions into the new Carbon Management Plan (CMP). Development of the CMP has progressed on that basis.

As noted earlier, the State Government has a target to achieve 100% net renewable electricity generation by 2027. That being the case, the opportunity to further support the community to reduce greenhouse gas emissions rests with initiatives such as electrifying other energy uses (e.g. electric heating instead of wood burning, electric cooking instead of gas cooking, electric (or non-powered) forms of transport instead of combustion engine vehicles), making net zero purchasing choices, reducing waste generation, etc).

As mentioned earlier in this report, community input has been sought to identify ways the community would like Council to support carbon emissions reductions. Ideas included:

- Conducting public education and community workshops on sustainable living practices
- Facilitating community bulk buy for items supporting electrification and sustainable living, such as electric vehicles, E-bikes, electric cooktops, electric hot water heaters, composting infrastructure and eco-nappies
- Providing small grants for community groups and individuals to take actions specifically addressing carbon emissions
- Advocating for better access to public transport and investing in facilities to make public transport more wet-weather friendly
- Providing incentives for all electric transition – e.g. taking people off gas and wood burning for heating, cooking and hot water
- Facilitating co-working opportunities to reduce the need for commuting.

A Community Renewables Program is the type of initiative which could feature in the CMP as one way in which the Council could support its community to access *more affordable* renewable energy. However, for reasons discussed earlier in this report, it is unlikely to result in significant actual carbon emissions reductions. If the primary objective is to support the community to reduce carbon emissions, other initiatives, such as those listed above, would likely provide a better return on investment.

Other considerations

It should be noted that there are many providers of solar panels and home batteries in the market, and several providers of VPPs. There are commercial cost comparison and quote sourcing providers which can assist consumers to access cost effective and reliable systems and schemes. It is not necessary for Council to play a role in provided consumers with access to these products, however it is acknowledged that some consumers find it difficult or onerous to undertake their own research and may find some benefit in the Council providing a recommendation of a particular supplier.

OPTIONS

The following options are submitted for consideration:

Option 1- AHC Community Renewables Program

Should Council wish to pursue this path, the following resolution is recommended:

1. That the Council develops a community renewable energy program tailored to the Adelaide Hills community, to assist the community gain more affordable access to renewable energy.
2. That an ‘expression of interest’ and/or ‘request for proposals’ process be undertaken to procure a suitable program delivery partner and that the results of the process be subject to a further report to Council before entering into any agreements.
3. That the program contemplated in points 1 and 2 be subject to the allocation of $200,000 operating funding in the 2025-26 Annual Business Plan and Budget for the development of procurement documentation, professional advice, legal advice and

other costs associated with developing the scheme and procuring an appropriate commercial partner.

4. That Council notes that budget allocation would also be required in subsequent years to implement and maintain the program.

Option 2 – City of Mitcham/ShineHub Community Renewables Program

Should Council wish to pursue this path, the following resolution is recommended:

1. That the Council commits, in principle, to enter into an arrangement with ShineHub for the provision of a community renewable energy program with the same or similar offering to that provided to the City of Mitcham.
2. That $17,000 be made available through the next budget review process to enable immediate costs to be incurred in undertaking essential due diligence and the development of deeds of agreement with Shine Hub.
3. That the program contemplated in points 1 be subject to the allocation of $97,000 operating funding in the 2025-26 Annual Business Plan and Budget.
4. That Council adopt the City of Mitcham procurement process and considers the market testing, due diligence and assessments undertaken are satisfactory, that the Council does not need to undertake a procurement process and that the relevant procurement and probity requirements of the Council Procurement Policy are considered to have been met to implement a Community Renewables Program.
5. That Council notes that the point in time when the City of Mitcham undertook and completed its procurement processes is sufficiently recent to be a relevant process in the development of a Community Renewables Program.
6. That Council acknowledges that ShineHub is a supplier with sufficient and considerable experience in Community Renewable Programs for local government and considers that this is sufficient for Council to progress with a Community Renewables Program without undertaking a competitive tender process.
7. That the Chief Executive Officer be authorised to negotiate the particulars of any agreements with Shine Hub and execute same for and on behalf of the Council.

Option 3 – Corporate and Community Carbon Management Plan

Should Council wish to pursue this path, the following resolution is recommended:

1. That Council continues the development of a new Carbon Management Plan, including consideration of the ideas raised by the recent community focus group, incorporating programs and initiatives to support the community to reduce carbon emissions.
2. That programs arising from the Carbon Management Plan be subject to consideration through the normal annual business planning and budget setting process.

1. APPENDICES

(1) Community Renewables Program – Cost and emissions analysis

Appendix 1

Community Renewables Program – Cost and emissions analysis

dsquared

Adelaide Hills Council

Community Renewables Program

Cost & emissions analysis

D Squared Consulting Pty Ltd
Trading as dsquared
ACN 159 612 067
ABN 38 159 612 067

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Project Number: 3154

Document Control

Issue	Date	Change	Checked	Approved
01	18/09/24	First draft issue	DD	JP
02	27/09/24	Second draft issue	DD	JP

Our Vision is to **think beyond the square**.

Our Mission is to create spaces, places, and communities that are positive for both the environment and for people. We will do this by providing our clients with sustainable and bespoke solutions that are innovative, challenge perceived ideas, and push the boundaries of achievement and excellence.

We confirm that all work has been undertaken in accordance with our ISO 9001 accredited quality management system.

Acknowledgement of country

The dsquared team wish to acknowledge the Traditional Custodians of all country throughout Australia, and their cultural, spiritual, physical, and emotional connection with their land, waters, and community. We pay our respects to all Elders past, present, and emerging.

Contents

Executive summary

The purpose of this report is to provide a summary of the analysis undertaken of the City of Mitcham's Community Renewables Program to inform Adelaide Hills Council on adopting a similar program. The analysis has included a number of electricity consumption, cost and emissions scenarios and assessments.

The objective of the analysis is to enable Adelaide Hills Council (Council) to:

- Make an informed decision on how best to support the community on increasing renewable energy, energy storage, and reducing emissions and costs.
- Assess the ShineHub program to understand any assumptions and qualifications that may impact the viability of adopting the program.
- Demonstrate the expected cost and emissions reduction opportunities by adopting a community renewables program, including how future greening of the grid may impact community renewables programs.
- Ensure Council considers the risks and opportunities of supporting community renewables as they relate to procurement and available technologies.

The City of Mitcham's Community Renewables Program aims to accelerate the transition to renewable energy by supporting residents to install solar PV systems and battery storage. To achieve this, the City of Mitcham developed a program which is being delivered by ShineHub. The program aims to facilitate the bulk-buy of solar PV and battery storage systems, support the rollout of renewable energy systems on council facilities, and support a Virtual Power Plant (VPP) model.

Key assessment outcomes

Based on the assessment the following key outcomes were identified:

- In line with the program aims, City of Mitcham's program is expected to result in overall electricity consumption savings for residents and reduce emissions, and support increased renewable energy in the council area and South Australia. However, the scale of the cost and emissions savings is expected to be overestimated and may not reflect actual savings for residents. Key differences include:

	ShineHub assessment	dsquared assessment	Difference	Percentage (%)
Annual cost saving	$2.8m	$2.1m	$0.7m	-25%
Year one emissions reduction (t CO_2-e)	1,695	1,360	-335	-20%
Lifetime emissions reduction (t CO_2-e)	39,549	8,418	-31,131	-79%
Total resident savings over 10 years	$15.48m	$7.24m	-$8.24m	-53%
Simple payback	4.5 years	6 years	1.5 years	33%

- The financial analysis identified that a typical resident could reduce their electricity consumption costs by approximately $2,500 per year (Year 1). This figure reduces as the solar PV and battery storage systems degrade in line with their warranted performance and does not include the costs associated with purchasing the system.

- Purchasing a solar PV and battery storage system upfront provided the greatest return on investment, however is expected to be challenging for many households due to the high upfront costs. Providing a payment plan option provides flexibility for residents and reduces the upfront burden.
- By adopting the payment plan, total electricity costs only reduced by approximately $400-500 per year when including the monthly payments and savings reduce over time. The total cost of adopting the payment plan should be clearly communicated to residents if a similar program is adopted.
- The average payback for the program is approximately 6 years, 1.5 years (>30%) longer than the ShineHub assessment. This is likely due to a number of assumptions in ShineHub's calculations not aligning with industry standards and approaches.
- Solar PV systems provide the greatest return on investment (4-5 years) compared to battery storage (11-12 years). The shorter payback period on the solar PV is covering the longer battery payback which distorts the value of solar PV vs. battery storage. A payback greater than 7 years is typically not recommended and there are other energy efficiency technologies and electricity cost reduction options which will provide a faster return on investment.
- The expected savings from the program is between $2.1-$2.3m, approximately 25% less than the figures in the ShineHub assessment. This includes an electricity price increase of 1.5% per annum however electricity prices vary considerably and are challenging to accurately project.
- Total emissions reduction for the City of Mitcham's residential program (as of July 2024), is estimated to be 1,360 tCO_2-e in the first year of operation. This is approximately 1% of 2020/21 community emissions.

Assessment qualifications

Compared to the ShineHub reported figures, a number of differences and discrepancies were identified which should be noted. This includes the reported assumptions, emissions, and cost calculations not aligning with expected figures when calculating the impact of solar PV and battery storage. Key discrepancies include:

- 100% of solar PV generation has been claimed as an emissions reduction which will include electricity exported to the grid. Under carbon accounting standards such as the Climate Active Carbon Neutral certification, electricity exported to the grid cannot be claimed as an emissions reduction unless Large-scale generation certificates (LGCs) are generated and accounted for. ShineHub may have claimed that all solar PV generated will be consumed by participants in a VPP program, however not all participants will form part of the VPP and there will be periods of time where the VPP will not be exporting electricity. In addition, solar PV systems and exports can be curtailed when grid stability is at risk, reducing solar export opportunity.
- Emissions savings from electricity exported to the grid from battery storage has been calculated in addition to the solar PV generation. This is double counting the emissions benefit from generating electricity from solar PV.
- The battery storage kWh stated for VPP participation is significantly higher than expected. The reported calculations are based on 30% of the battery capacity (kWh) being used for VPP participation across the year, however ShineHub's website states that the battery is only expected to be used 2 times per week.
- The cost reduction calculations are based on a fixed figure multiplied by 10 years and does not take into account assumptions such as solar PV and battery storage system degradation. As a result, total savings are expected to be overestimated by a large factor.
- The lifetime emissions savings do not take into account future projections of renewable energy share in South Australia. Projections are available that take into account future generation mixes which should be used to ensure emissions savings are not overestimated.

- The lifetime emissions savings are based on the solar PV system operating for 25 years. This is the warranty period associated with the solar panels however the inverter is expected to require replacement earlier (with a 10-year warranty) and panels are typically replaced earlier than 25 years. This overstates the lifetime emissions reduction from solar PV.
- There are a number of assumptions and references in the ShineHub assessment which should be reviewed and updated, in particular if a council plans to make media announcements and submit award nominations based on the figures. The outcomes of the program are positive but should be considered as part of a larger assessment.

Recommendations

The assessment has identified that supporting a solar PV and battery storage program has merits which council could facilitate to reduce electricity emissions and costs. However, solar PV and battery storage are not the only opportunities to reduce costs and emissions, and the costs savings are less than the quoted figures by ShineHub.

The following options are recommended for Adelaide Hills Council to consider:

- **Option 1 – AHC Community Renewables Program:** Developing a local bulk-buy program which enables VPP participation but expanding the program to include additional options such as going all-electric / getting off gas (heat pumps for hot water and induction cooktops), supporting electric vehicles (EV charging), and energy efficiency improvements. The program should aim to support local SA and Adelaide Hills based businesses that can support installations and specify technologies that are compatible with VPP providers. There are multiple VPP providers operating in SA that can provide rebates for installing solar PV and battery storage systems. The program should also provide information on sourcing competitive payment plans and interest rates, including alternate options for green loans / finance, and provide recommendations for where to go for financial advice.
- **Option 2 – ShineHub:** The overall ShineHub program is providing cost and emissions reduction outcomes and could be adopted by Council. In the event Council adopts the ShineHub program, it is highly recommended that reporting criteria and methodologies are specified in the agreement to ensure Council are receiving accurate information on the program's electricity consumption, cost and emissions reductions. There is also a risk that specifying one program partner may introduce risks associated with Council's reputation. For example, if the savings are not as high as stated or the one technology ShineHub uses has manufacturing defects.
- **Option 3 – Corporate and Community Carbon Management Plan:** Developing a community emissions reduction program based on the Corporate and Community Carbon Management Plan currently in development. This includes considering a program that addresses more than just electricity as Council's community profile has significantly more emissions associated with transport and includes other sources such as agriculture.

In addition, it is recommended that Council consider:

- Opportunities to support residents on improving energy efficiency. Solar PV and battery storage is often covering inefficient buildings and systems that could provide a longer-term benefit to the household. For example, battery storage is only expected to last 10-15 years, has a payback of 10-11 years, and will need to be replaced. Whereas improving insulation and installing double glazing are expected to last 20+ years.
- Providing community webinars, training and information on emissions reduction options and how to assess whether solar PV and battery storage is appropriate for their household. For example, installing solar PV and battery storage may not be appropriate if the household is connected to gas bottles for heating, cooking and hot water. An all-electric solar powered solution excluding battery storage may be the better solution and have a larger impact on costs and emissions.

1 Introduction

1.1 Purpose

The purpose of this report is to provide a summary of the analysis undertaken of the City of Mitcham's Community Renewables Program to inform Adelaide Hills Council on adopting a similar program. The analysis has included a number of scenarios including:

- **Do nothing** – Council does not support a community renewables program.
- **ShineHub** – Adopting a similar bulk-buy and Virtual Power Plant (VPP) program as the City of Mitcham.
- **Solar PV and Battery Bulk-buy** – Supporting a community program to bulk purchase solar PV and battery storage for residents.

1.2 Objectives

The objective of the analysis is to enable Adelaide Hills Council (Council) to:

- Make an informed decision on how best to support the community on increasing renewable energy, energy storage, and reducing emissions and costs.
- Assess the ShineHub program to understand any assumptions and qualifications that may impact the viability of adopting the program.
- Demonstrate the expected cost and emissions reduction opportunities by adopting a community renewables program, including how future greening of the grid may impact community renewables programs.
- Ensure Council has considered the risks and opportunities of supporting community renewables as they relate to procurement and available technologies.

1.3 Scope

The scope of the assessment is to analyse:

- The total cost and payback of adopting community renewable energy programs such as ShineHub.
- The emissions reduction achieved by increasing solar PV and energy storage.

1.4 Sources of information

A range of information and references has been used in the analysis including:

- Publicly accessible information provided by ShineHub and the City of Mitcham, as well as information sourced by Adelaide Hills Council.
- Publicly available information from other council meetings and Elected Member presentations on community renewables (published agendas and minutes).
- Research, analyses, and cost information from public sources and dsquared's projects that have incorporated renewable energy and energy storage technologies.

2 Approach & assumptions

2.1 Introduction

The following section summarises the assumptions, references and modelling included in the assessment.

2.2 Assumptions

The following assumptions and references have been included in the assessment:

Table 1: Summary of assumptions and references

Assumption / reference	Unit / measurement	Summary	Source
The below has been used to assess ShineHub's offer in line with information communicated to Council by the City of Mitcham / ShineHub.			
Electricity emissions factor	0.28 kg CO_2-e / kWh	A combined scope 2 and 3 location-based electricity emissions factor has been used to align with ShineHub's analysis, updated to the 2024 version (released September 2024).	National Greenhouse Accounts Factors 2024
Emissions factor for exported battery storage electricity	0.4 kg CO_2-e / kWh	A higher emissions factor has been applied for electricity exported from the battery during peak periods in line with ShineHub's assessment. However, the emissions factor reduces in line with the emissions factor projects to account for increasing renewables in the grid.	ShineHub - Emission Calculations and Program Outcomes
Electricity emissions projections	Reducing electricity emissions factor applied in line with Australia's Emissions Projections 2023 which considers increasing renewable energy generation in South Australia's grid.		Australia's Emissions Projections 2023
Electricity cost	$0.426 / kWh	A flat peak electricity rate of $0.426 per kWh has been used to align with the ShineHub assessment.	ShineHub - Emission Calculations and Program Outcomes
Electricity cost increase	1.5% annual increase	An annual electricity price increase of 1.5% has been applied in line with ShineHub's assessment.	wattever.com.au/
Solar PV system life	20 years	The solar PV system calculations are based on a 20-year life. ShineHub referenced a 25 year life however this is the product warranty for the solar panels and a shorter period has been used.	Solar Panels - ShineHub
Battery discharge as part of VPP	20%	A 20% discharge across the year has been used in the analysis. The 30% discharge included in ShineHub's assessment is expected to be high and households are not expected to be comfortable with 30% their battery being utilised for the VPP on a daily basis, reducing the life of the battery and back-up provisions.	

Assumption / reference	Unit / measurement	Summary	Source
Number of VPP events	2 per week	2 discharges per week have been estimated based on ShineHub's website.	Virtual Power Plant - ShineHub
Battery storage life	15 years	The analysis has assumed the battery will require replacement at 15 years. Based on the warranted degradation, battery capacity is expected to be down to 70% and will likely require replacement. Replacement may be required sooner depending on a number of factors including battery usage, depth of discharge, and maintenance of the batteries.	Solar Batteries - ShineHub
Battery degradation	2% per annum	ShineHub's battery supplier Hinen have warranted their battery to have 80% of the original capacity at 10 years. A 2% degradation factor has been applied to the battery storage capacity however this may be more or less depending on the frequency of use, depth of discharge, and maintenance practices.	Solar Batteries - ShineHub
Household consumption profile	Approx. 7,000 kWh / annum	To enable a consumption profile to be assessed, the modelling is based on average electricity consumption for a South Australian household (2.5 persons per dwelling). This has been modelled over 4 seasons to develop a residential demand profile.	Residential energy consumption benchmarks - 9 December 2020_0.pdf (aer.gov.au)

2.3 Qualifications

The following qualifications and concerns relating to ShineHub's assessment should be considered:

Table 2: Qualifications summary

Topic	Assessment
Electricity emissions factor	ShineHub have applied a flat emissions factor over the 25-year life of the solar PV and energy storage assessment. This is significantly overestimating the emissions reduction achieved as South Australia's electricity grid continues to transition to 100% renewable energy generation. Although it is expected there will be fossil fuel-based power in the grid for many years, electricity emissions are expected to continue to reduce in South Australia. Australia's Emissions Projection 2023 for South Australia have been applied to align with government projections and account for increasing renewables.
Emissions factor for exported solar PV generation	All electricity generated from the solar PV system has been allocated a flat emissions factor. This will not reflect actual emissions reduction outcomes due to: • Solar PV generation exporting to the grid during high renewable energy generation periods i.e., excess solar PV generation will export when emission intensity is low. • 100% of solar PV generation will not be consumed onsite and therefore claiming the full scope emissions reduction is not accurate. • 100% of the solar PV generated will not be stored by the battery and excess will be exported to the grid.

Topic	Assessment
Emissions factor for exported battery storage electricity	The analysis has assumed a flat 0.4 kg CO_2-e / kWh emissions factor for electricity exported by the battery. This does not appear to have been based on modelling for average emissions intensity in the grid and the actual figure may be higher or lower. It is not recommended that emissions abatement from battery storage is claimed until a more detailed analysis is undertaken.
30% electricity exported from the battery	The ShineHub analysis has assumed 30% of the available battery storage kWh is used to support VPP / export during peak times. It is not expected: • That the battery will be used this frequently for VPP / grid support. ShineHub's website states approximately 2 events per week for VPP use. • 30% will be available at all times or used throughout the year i.e., during low generation periods with high energy demand (winter) the battery is not expected to be fully charged everyday in line with the assumptions.
Battery emissions abatement	ShineHub has calculated the emissions reduction from the batteries in the VPP which assumes that the batteries are displacing grid electricity with higher amounts of fossil fuels. However, the solar PV emissions reduction has already been claimed in the solar PV calculations and cannot be double counted.
Electricity cost	The flat peak electricity rate is not an accurate reflection of residential electricity tariffs following the installation of solar PV and battery storage. Following the installation of solar PV and energy storage, a smart meter will be installed, and the customer shifted to a time-of-use tariff which varies throughout the day. This will change the financial outcomes for the customer.
Electricity cost increase	An annual electricity price increase of 1.5% may be below or above actual increases, however future electricity prices are difficult to project and can be impacted by multiple external factors such as conflict, supply chain impacts, and financial markets.
Solar PV system life	A 25-year life has been applied to the total solar PV system however a 25-year warranty only applies to the solar panels with most inverters warranted for 10 years and expected to last up to 15 years. It has therefore been assumed that the design life will be shorter, and that the solar PV system will require replacement at 20 years.
Solar PV degradation	A 1.5% degradation factor has been applied to year 1, and then 0.5% for the remaining years to account for solar panel performance losses in line with ShineHub's assessment.
Battery life & degradation	Battery storage life has not been included in the ShineHub summary, however the warranty for the ShineHub systems in 10 years (which approximately equates to a daily discharge over 10 years). A 15-year life has been applied however depending on use this could reduce to 10 years e.g., batteries discharged more than once daily.

3 Solar PV & battery storage analysis

3.1 Introduction

The following section summarises the solar PV and battery storage modelling undertaken to inform the emissions and cost calculations.

3.2 Solar PV & battery storage systems analysis

ShineHub offer a range of solar PV and battery storage systems as hybrid packages and standalone components. Based on the information provided by ShineHub, 66% of residential customers have selected a hybrid solar PV and battery storage solution and 28% have selected a battery only.

The average system size is 7.3kW of solar PV and 11.7kWh of battery storage across the program. As a result, following two product offerings have been modelled with and without battery storage to demonstrate the expected energy, emissions, and cost reductions for residents choosing these packages.

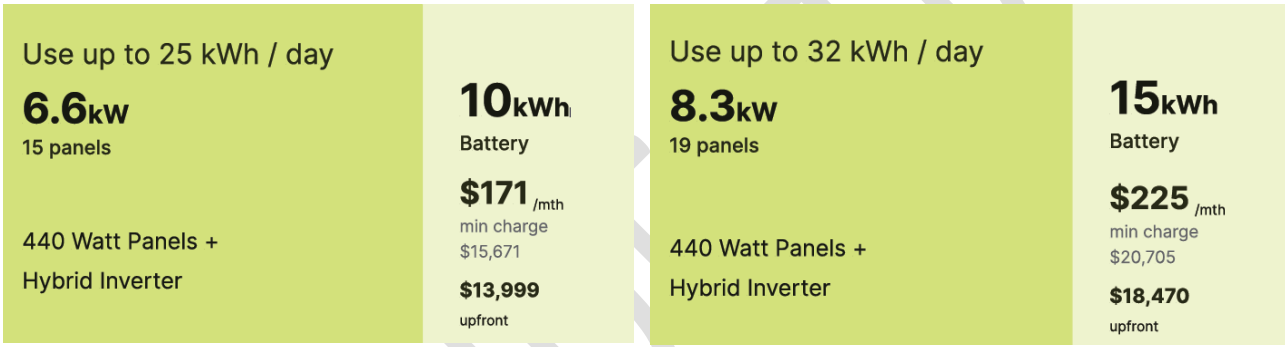

Figure 1: ShineHub prices

Based on the analysis, the following key outcomes have been identified for the first year of operation:

- A standalone 6.6kW to 8.3kW solar PV system is estimated to reduce grid electricity consumption by 42-43% for a standard household. Increasing beyond this size has minimal impact on grid consumption and will simply export more to the grid.
- A hybrid 6.6kW solar PV system coupled with 10kWh battery storage is estimated to reduce grid electricity consumption by 86%. The remainder of the energy is exported to the grid or lost in conversion.
- A hybrid 8.3kW solar PV system coupled with 15kWh battery storage is estimated to reduce grid electricity consumption by 95%. The remainder of the energy is exported to the grid or lost in conversion.
- Households will still be importing electricity during periods of low solar PV generation, when battery storage has been discharged, and when load / demand is higher than the battery capacity's peak discharge rate.

The below provides a summary of the findings without the utilisation of the battery as part of a VPP:

Table 3: Solar PV modelling

Solar PV only		
PV Size	**6.6kW**	**8.3kW**
Inverter Size (kW)	5.5	7.2
Annual Electricity Use (kWh)	7,033	7,033
Total Solar Generation (kWh)	9,921	12,547
Direct PV Consumption (kWh)	2,923	2,992
PV Generation Export (kWh)	6,997	9,554
Grid Import (kWh)	4,110	4,041
Grid Independence	**42%**	**43%**

Table 4: Solar PV and battery storage modelling

Hybrid solar PV and battery storage		
PV / battery size	**6.6kW / 10kWh**	**8.3kW / 15kWh**
Inverter Size (kW)	5.5	7.2
Battery Size (kWh)	10.24	15.36
Annual Electricity Use (kWh)	7,033	7,033
Total Solar Generation (kWh)	9,600	12,190
Battery Discharge (kWh)	3,207	3,859
Direct PV Consumption (kWh)	2,808	2,854
PV Generation Export (kWh)	3,585	5,477
Grid Import (kWh)	1,019	321
Grid Independence	**86%**	**95%**

The analysis has demonstrated that across the year, households will be able to reduce their grid electricity consumption by 80-90% by installing solar PV and battery storage. In the event that a VPP provider is provided access to the battery for grid support services, this will reduce the usable battery storage capacity by 10-30% depending on the VPP provider.

3.3 Consumption, emissions and cost analysis

Based on the above analysis, the emissions reduction potential of the solar PV and battery storage systems has been calculated including:

- Solar PV self / direct consumption
- Battery self / direct consumption
- Solar PV export to the grid
- Battery export to the during peak periods as part of a VPP.

3.4 Year one summary

The analysis has identified that on average a household will reduce annual electricity consumption, costs, and emissions in line with the following for the first year of operation

Table 5: Year one analysis summary

Consumption analysis	
Baseline electricity consumption (kWh) – Prior to solar PV / battery storage	7,033kWh
Grid electricity consumption (kWh) – Post solar PV / battery storage / VPP*	2,386kWh
Grid independence (%)*	**75%**
Electricity consumption cost analysis	
Electricity consumption cost	$2,996
Annual cost reduction ($)**	$2,468
Electricity costs post install	$416
Cost reduction (%)	**82%**
Emissions reduction	
Annual electricity emissions (tCO_2-e)	1.55 tCO_2-e
Annual emissions reduction (tCO_2-e) – Year One	1.26 tCO_2-e
Emissions reduction (tCO_2-e)	0.29 tCO_2-e
Emissions reduction (%)	**82%**

*Grid independence reduces due to battery used as part of the VPP.

**Includes VPP revenue for export to the grid.

The above analysis is for the first year of operation and demonstrates that the solar PV and battery storage solution is capable of significantly reducing electricity consumption, costs, and emissions for an average household. However, this is based on the first year of operations and does not consider forward projections, whole of life costs, and Net Present Value (NPV) taking into account any debt or investments residents may have.

3.5 Savings estimates

The following summarises forward projections for the estimated electricity consumption, emissions, and cost reductions taking into account:

- Reducing electricity emissions in the South Australian grid
- Increasing electricity costs
- Degradation of the solar PV and battery storage
- Estimate end of life of the solar PV and battery storage systems.

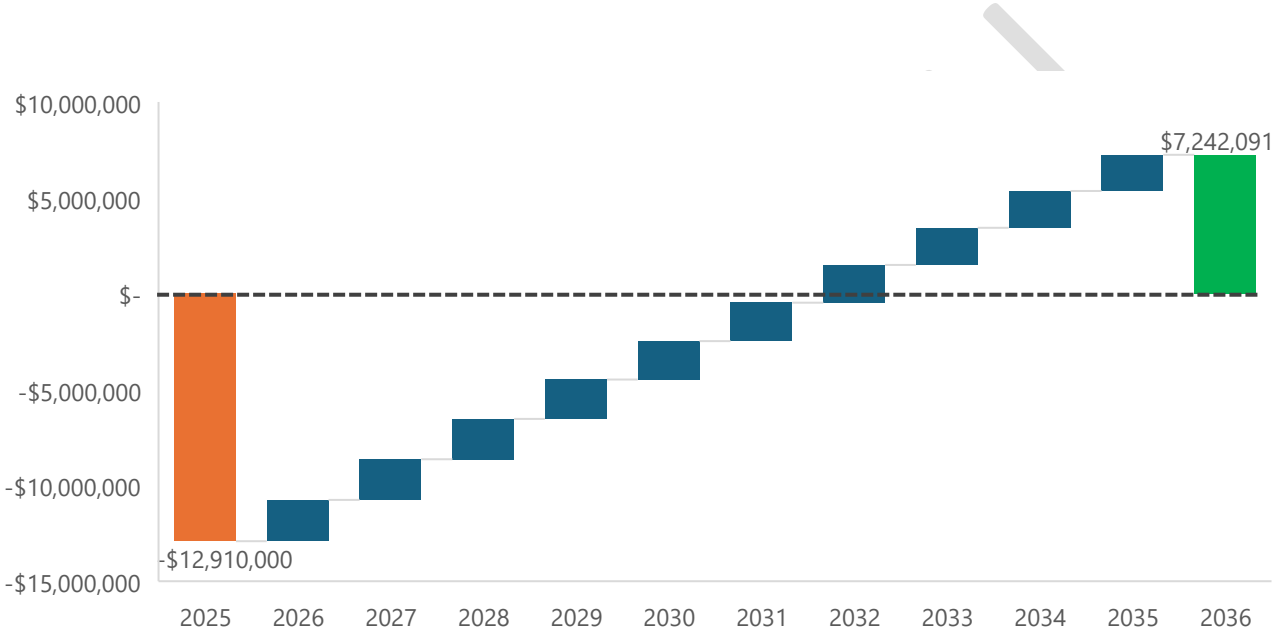

Figure 2: City of Mitcham - Cost analysis

Based on the assessment and using ShineHub's capital investment figure, the simple payback has been estimated to be approximately 6 years, 1.5 years (>30%) longer than the ShineHub estimate. The total savings from the program has also been estimated at approximately $7.5m, less than half the ShineHub estimate which is based on multiplying the first annual savings by 10 years. This is due to reducing solar PV generation and battery storage capacity as the systems degrade.

A 6-7 simple payback period for a hybrid solar PV and battery storage system is similar to average paybacks quoted on websites such as Solar Quotes and Solar Choice that have their own battery calculators available for public use.

3.5.1 Annual resident savings

The below assess an average household that has adopted a 10-year payment plan for a hybrid solar PV and battery storage solution versus paying upfront for an equivalent system. The analysis demonstrates that:

- The cost of adopting a payment plan + annual electricity costs total approximately $43,000 across 20 years. Electricity costs reduce by approximately 15% during the first 10 years. This should be clearly communicated to residents as the warranty expires at year 10 and there is no guarantee the battery will last up to 15 years.
- The cost of paying for the solar PV and battery storage system upfront + annual electricity costs over 20 years totals approximately $37,000, saving residents approximately $6,000 compared to the payment plan.
- The simple payback of purchasing a hybrid solar PV and battery storage system is approximately 6 years.

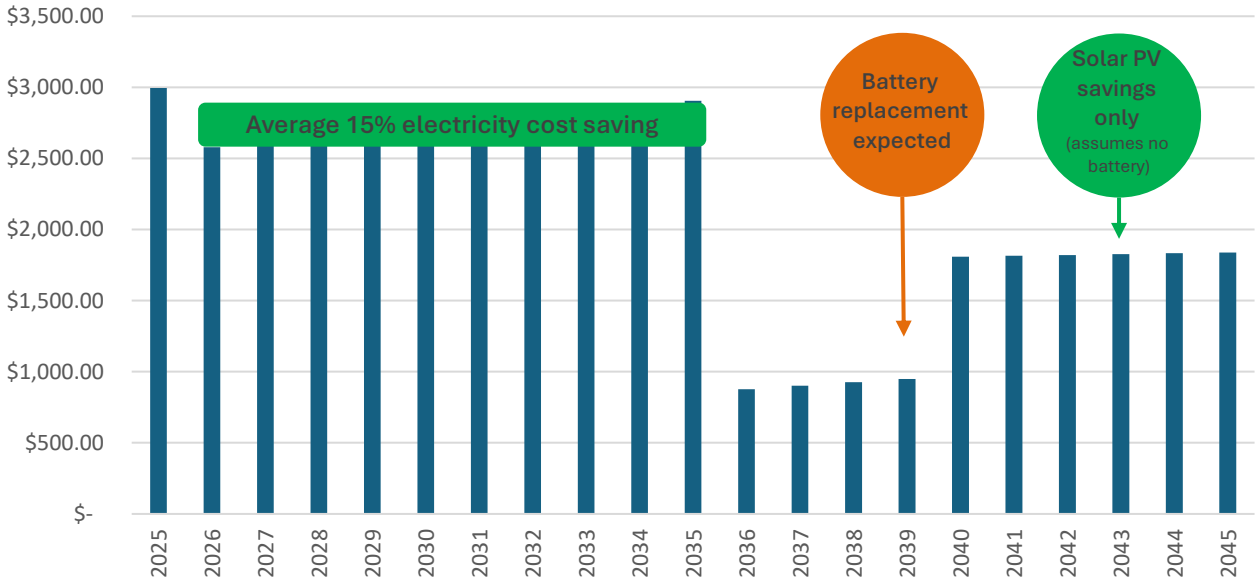

Figure 3: Annual electricity costs including payment plan

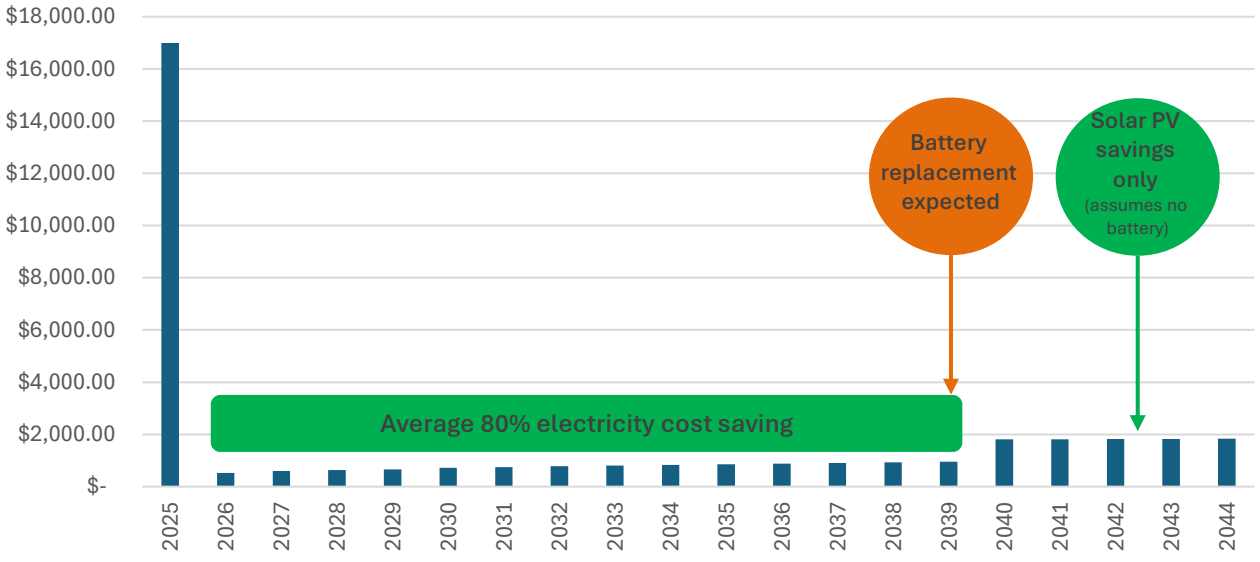

Figure 4: Upfront solar PV and battery cost analysis

3.5.2 Upfront solar and battery payback

The simple payback for purchasing a hybrid solar PV and battery storage system is as follows, with a 6-year payback expected.

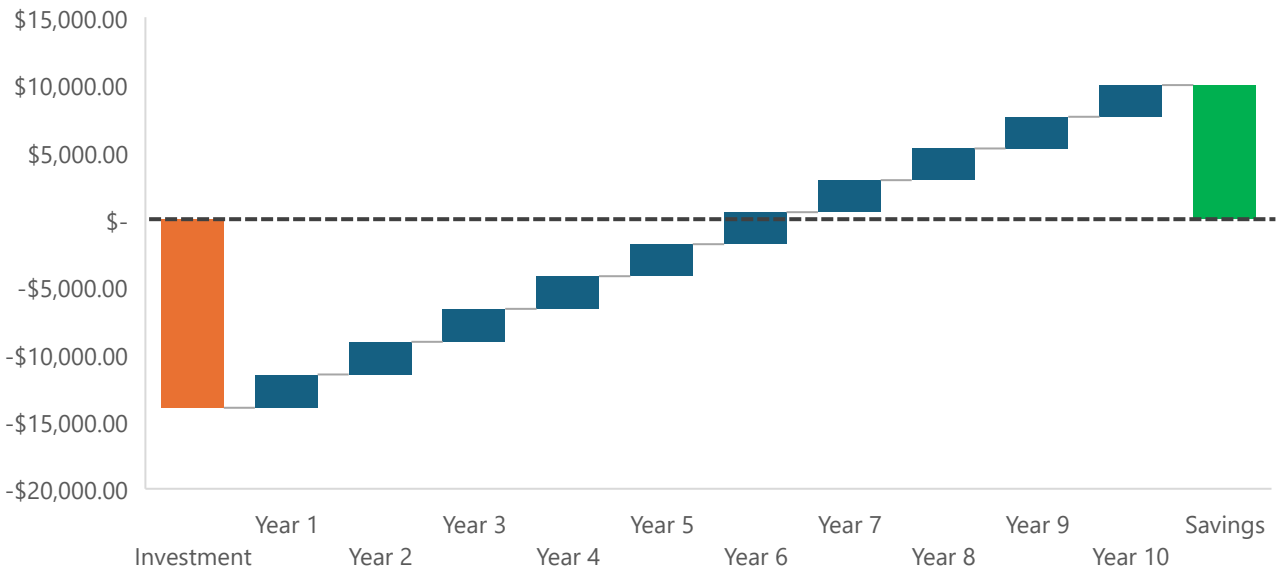

Figure 5: Solar PV and battery storage payback

3.5.3 Solar PV payback

It should be noted that that the payback period for solar PV and battery storage system is heavily weighted with solar PV providing most of the payback and assisting to cover the upfront costs of the battery. The below is the estimated savings over 10 years to install solar PV, with a payback of 4-5 years expected.

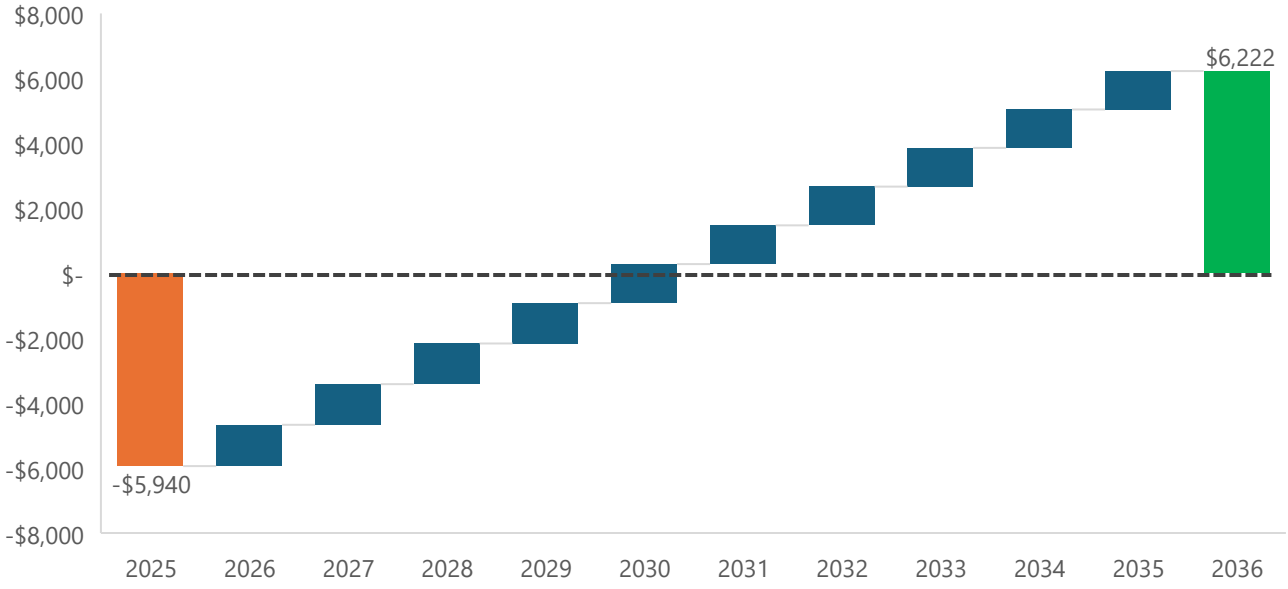

Figure 6: Solar PV payback

3.5.4 Battery storage only payback

The ShineHub offer includes a battery storage only offer which is installed with an existing solar PV system. A payback analysis has been undertaken and identified that battery storage has a 10–11-year payback. Paybacks of <7 years are typically recommended to achieve a strong return on investment.

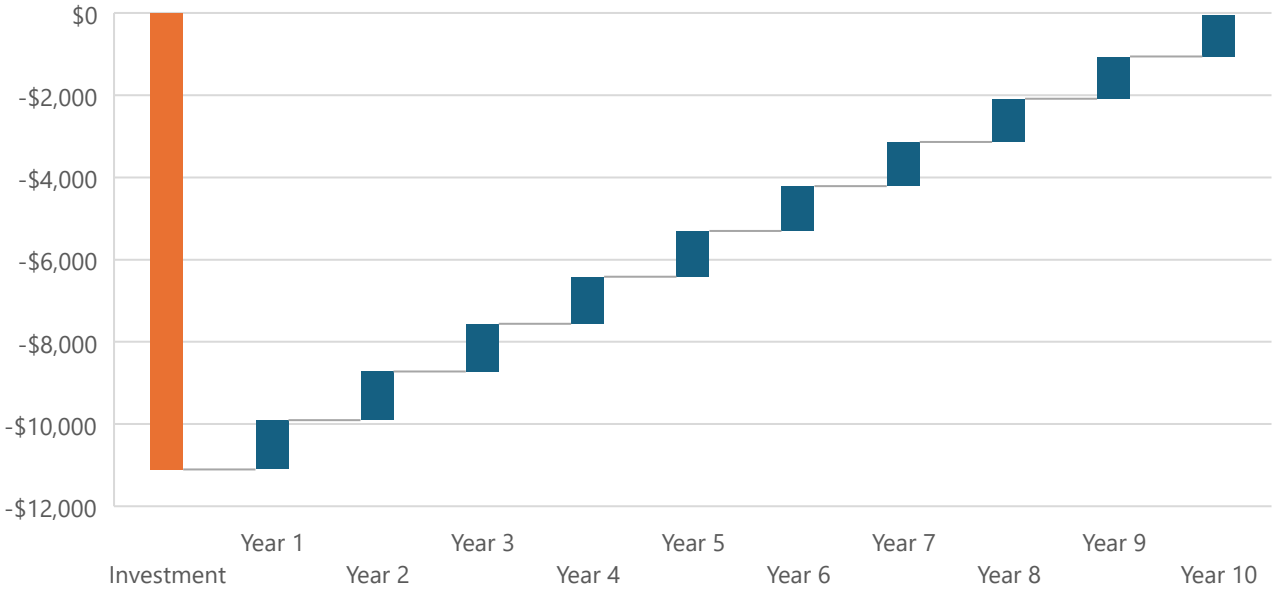

Figure 7: Battery storage payback analysis

The above analysis achieves similar outcomes to analyses published by the Australian Energy Market Commission (AEMC) that have estimated battery storage paybacks of 10 years in Australia (refer Figure 8).

Year	Installation Cost ($)	Net Incentive ($/kWh)	Payback Period (Years)	Life of an average battery (Years)
2016	10,349	0.20	19.05	8.35
2022	8,491	0.24	10.11	9.79
2025	8,491	0.30	7.47	9.79

Figure 8: AEMC battery payback summary - https://www.aemc.gov.au/turning-point-incentives-invest-residential-batteries

The AEMC have stated that increasing returns on investment coupled with improving warranties will achieve a payback of approximately 7.5 years by the end of 2025. In addition, battery prices are projected to continue to decrease which will further improve the financial case for batteries. It is recommended that Council consider implementing a community renewables program from 2025 when battery prices are expected to have reduced further.

3.6 Net present value (NPV)

The above calculations are based on a simple payback period assessment which does not consider the Net Present Value (NPV) of investing the funds into solar PV and battery storage. This is an important consideration as many households will have existing debt such as mortgages and personal loans that will accrue interest. The below NPV has been calculated for the annual payment plan and upfront purchase based on the above calculations.

Table 6: Net present value (NPV) summary

Discount rate	5%	
Approach	Annual payment plan	Upfront purchase
Year	Return	Return
1	$416	-$11,531
2	$386	$2,438
3	$357	$2,409
4	$329	$2,381
5	$267	$2,319
6	$240	$2,292
7	$213	$2,265
8	$187	$2,239
9	$162	$2,214
10	$136	$2,188
11	$2,163	$2,163
12	$2,139	$2,139
13	$2,115	$2,115
14	$2,091	$2,091
15	$1,232	$1,232
16	$1,226	$1,226
17	$1,220	$1,220
18	$1,214	$1,214
19	$1,208	$1,208
20	$1,202	$1,202
Net Present Value	**$9,936**	**$12,449**

4 Emissions reduction

4.1 Introduction

The following section summarises the emissions reduction expected over a 20-year period for the City of Mitcham's Community Renewables Program (residents only).

4.2 South Australian electricity emissions

Electricity emissions in South Australia have been reducing significantly as renewable energy generation has become the largest source of power in the state. The ShineHub assessment is based on a Scope 2 emissions factor of 0.25 kg CO2-e / kWh. This does not appear to align with the published NGA Factors.

The below summarises the projected increase in renewable energy generation in South Australia and the associated emissions factor to 2035 which has been used in the analysis. Based on the projections, electricity emissions are projected to reduce by over 60% compared to 2023.

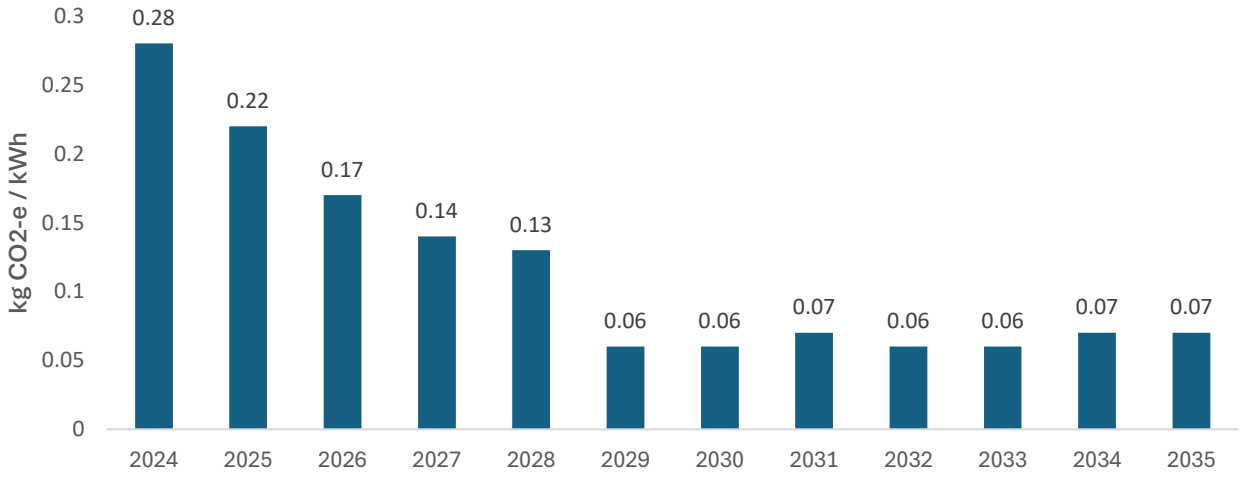

Figure 9: Electricity emissions factor projections

Based on the above emissions factor projections, the total emissions reduction expected from residential participants in the City of Mitcham's program is as follows, including a comparison to ShineHub's assessment.

Table 7: Consumption and emissions reduction summary

	TOTAL PV	PRODUCTION (KWH)		CO_2E ABATED (TONNES)	
		Annual	Lifetime	Year One	Lifetime
ShineHub summary	4,645	6,781,159	158,199,429**	1,695	39,549
dsquared analysis*	4,645	6,976,234	133,091,927***	1,360	8,418
Difference	-	195,075	-25,107,502	-335	-31,131
Difference (%)	-	**3%**	**-16%**	**-20%**	**-79%**

*Combined scope 2 and 3 emissions factor used.

**ShineHub analysis assumes a 25-year life for the solar PV system.

***Assumes a 20-year life for the solar PV system.

The estimated greenhouse gas (GHG) emissions reduction from installing solar PV and battery storage systems as part of the City of Mitcham's Community Renewables Program is estimated to be:

- 1,360 t CO2-e in year one.
- Approximately 8,500 tCO_2-e over 25 years (using a 20-year life for the solar PV system).

The blow is a summary of the 2020/21 Snapshot Climate tool's community emissions for the City of Mitcham with electricity consumption equating to approximately 125,000 tCO2-e. The Snapshot tool uses a combined Scope 2 and 3 emissions factor which differs from the Scope 2 emissions factor used by ShineHub.

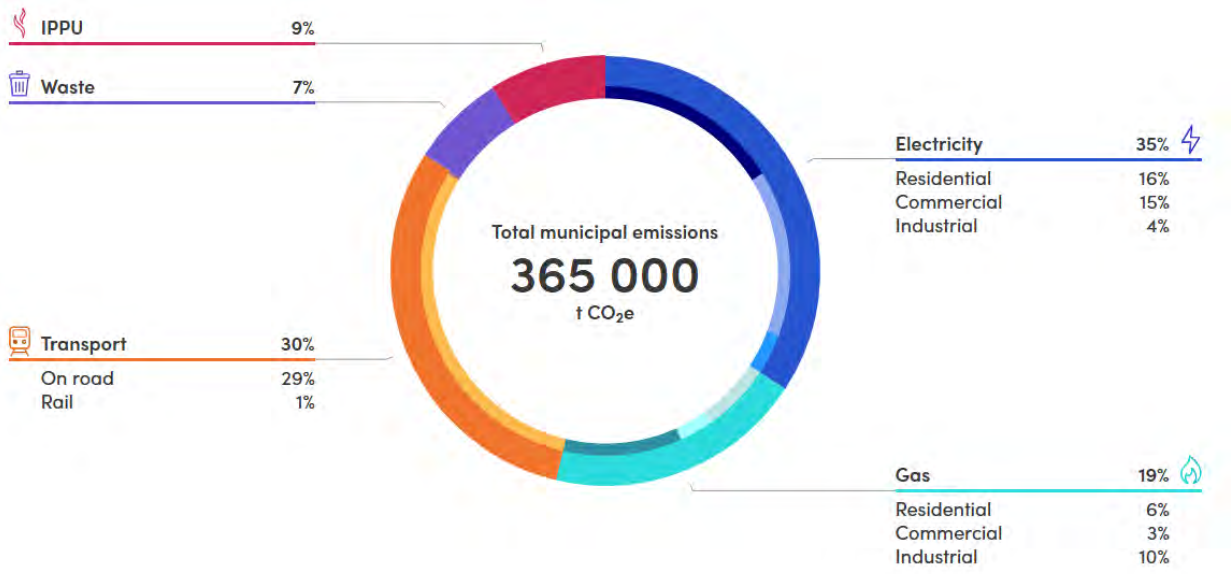

Figure 10: Snapshot Climate - City of Mitcham emissions summary

Based on the updated analysis, the residential program is estimated to reduce the City of Mitcham's community electricity emissions by 1-2%, and total emissions by 0.3%.

The Adelaide Hills Council emissions profile is as follows (refer Figure 11) which differs from the City of Mitcham and has a much higher share of transport emissions. It is recommended that Council consider Adelaide Hills emissions to prioritise programs to reduce emissions. This should also be considered as part of the Corporate and Community Carbon Management Plan currently in development.

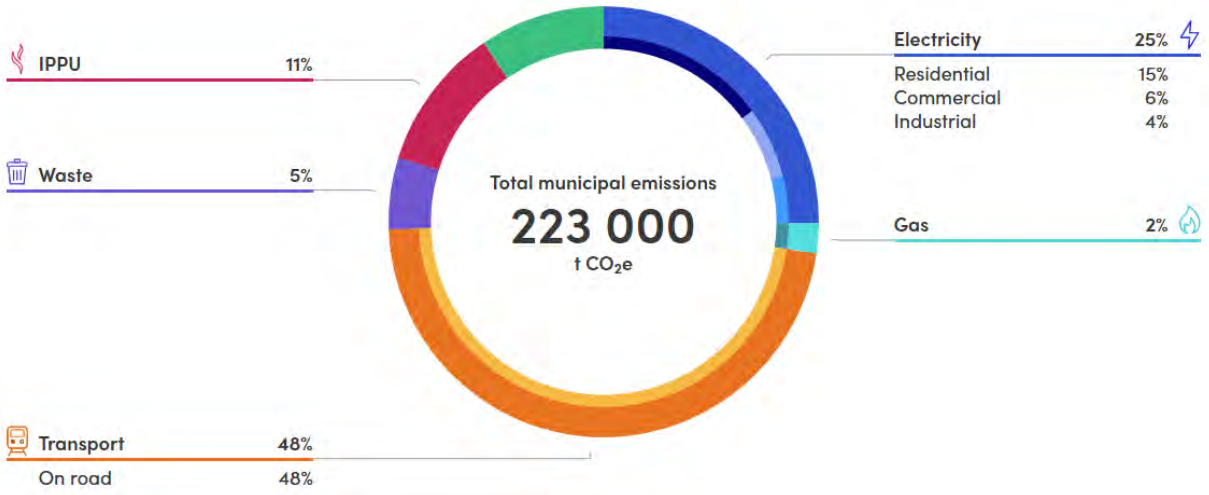

Figure 11: Snapshot Climate – Adelaide Hills emissions summary

5 Summary

This analysis has reviewed the City of Mitcham's Community Renewables Program to confirm the electricity costs and emissions reduction potential and inform Adelaide Hills Council on adopting a similar program. The analysis identified that the program is expected to result in overall electricity consumption savings for residents and reduce emissions, while also supporting increased renewable energy in the council area and South Australia. However, the scale of the cost and emissions savings is expected to be overestimated and may not reflect actual savings for residents.

The assessment has also identified that supporting a community renewables program has merits, but Council should consider a larger scope than just solar PV and battery storage. In particular, the Adelaide Hills community emissions profile differs significantly to the City of Mitcham with transport the main source of emissions for residents and businesses. As a result, energy efficient, renewable energy powered, and all-electric opportunities for buildings and transport have been identified for the community renewables program.

It is recommended Council consider the following options:

- **Option 1 – AHC Community Renewables Program:** Developing a local bulk-buy program which enables VPP participation but expanding the program to include additional options such as going all-electric / getting off gas (heat pumps for hot water and induction cooktops), supporting electric vehicles (EV charging), and energy efficiency improvements. The program should aim to support local SA and Adelaide Hills based businesses that can support installations and specify technologies that are compatible with VPP providers. There are multiple VPP providers operating in SA that can provide rebates for installing solar PV and battery storage systems. The program should also provide information on sourcing competitive payment plans and interest rates, including alternate options for green loans / finance, and provide recommendations for where to go for financial advice.
- **Option 2 – ShineHub:** The overall ShineHub program is providing cost and emissions reduction outcomes and could be adopted by Council. In the event Council adopts the ShineHub program, it is highly recommended that reporting criteria and methodologies are specified in the agreement to ensure Council are receiving accurate information on the program's electricity consumption, cost and emissions reductions. There is also a risk that specifying one program partner may introduce risks associated with Council's reputation. For example, if the savings are not as high as stated or the one technology ShineHub uses has manufacturing defects.
- **Option 3 – Corporate and Community Carbon Management Plan:** Developing a community emissions reduction program based on the Corporate and Community Carbon Management Plan currently in development. This includes considering a program that addresses more than just electricity as Council's community profile has significantly more emissions associated with transport and includes other sources such as agriculture.

3. Community Renewables Program – Duration of Confidentiality

Subject to the CEO, or his delegate, disclosing information or any document (in whole or in part) for the purpose of implementing Council's decision(s) in this matter in the performance of the duties and responsibilities of office, Council, having considered Agenda Item 19.1 in confidence under sections 90(2) and 90(3)(d) and (h) of the *Local Government Act 1999*, resolves that an order be made under the provisions of sections 91(7) and (9) of the *Local Government Act 1999* to retain the Items in confidence as detailed in the Duration of Confidentiality Table below:

Item	Duration of Confidentiality NB: Item to be reviewed every 12 months if not released
Report	Until Further Order
Related Attachments	Until Further Order
Minutes	Until Further Order
Other (presentation, documents, or similar)	Until Further Order

Pursuant to section 91(9)(c) of the *Local Government Act 1999*, the Council delegates the power to revoke the confidentiality order either partially or in full to the Chief Executive Officer.