EAGA
EASTERN ALLIANCE FOR GREENHOUSE ACTION

Solar Rates Business Case

Final Report

Prepared by Moreland Energy Foundation

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1 Contents

Figures and tables

2 Key terms and concepts

Capital cost	Cost of the solar PV system, associated components and installation.
Cash flow positive	Where the cost of finance is lower than the savings from investment, thus producing an immediate and ongoing net benefit to the householder.
Council rates charges mechanism	A low-risk finance option which utilises the rates scheme as a repayment mechanism for eligible households. In Victoria, this can occur through the *Special Rates Scheme (Sec 163)* of the *Local Government Act 1989* to provide an effective 'zero upfront cost' finance offer to eligible households.
Credit risk	The lender's judgement of the capacity of the loan recipient to meet regular or scheduled payments. Low income or disadvantaged residents may have a high credit risk due to low fixed income and employment status.
Energy consumption profile	When the household uses energy on a daily and annual basis.
Energy hardship	The Energy Services Commission (ESC) recently concluded the 'energy hardship' label requirement for assistance is arbitrary and misplaced (ESC 2015). Energy hardship is caused by a conjunction of factors – low income, energy prices, the condition of housing, and the capacity to adopt different household practices to manage energy use given its size, composition and needs (Chester 2013).
Income contingent loans	Government loans which are repaid only where the recipient has a certain level of income (*e.g.* HECS).
Interest rate	A reflection of the cost of money; the return (or profit) the lender requires factoring in the risk that the money will not be recovered (default). The return depends on the market conditions and the operating objective of the lender (e.g. profit or social outcomes).
Low income solar finance	Local government supported solar finance that enables net cash flow positive outcomes for low income households and minimises risk for all parties.
Micro finance	A type of unsecured private finance offered by a social sector agency, *e.g.* Good Shepherd, typically involving low or zero interest rates and short repayment periods.
Mortgage	A common example of private secured finance where the lender has rights to the property commensurate to the outstanding debt.
Potential low income target market/s	Households that would benefit from a low income solar finance program due to their vulnerability to energy hardship (broadly defined), high daytime energy use, large scale, ease of identification, likelihood of participation and potential co-benefits from solar finance.
Power Purchase Agreement (PPA)	Whereby a solar customer enters into an arrangement to defer the capital cost and buy electricity generated by the system at an agreed rate (i.e. c/kWh) and for an agreed time period.

Private finance	Finance provided by the private sector, sometimes in partnership with Government, Councils or NGOs.
Program model	An option for low income solar finance that incorporates a finance mechanism, target market and delivery approach.
Pensioners who own their homes	Homeowners who receive a Municipal Rates Concession. The concession provides a 50% discount on council rates up to a yearly maximum of $213 for 2015-16 to homeowners in respect of their principal place of residence where they hold either a Pensioner Concession Card or a Veterans' Affairs Gold Card.
Repayment term	The duration of the loan. To ensure cash flow positive outcomes this needs to be sufficiently long (*e.g.* 10 years).
Security	Security provides the finance lender some capacity to recover their money in case of default. Assets that depreciate in value (*e.g.* cars) have a resale value less than the purchase value, meaning the lender may not be able to recover the outstanding debt. Where debt can be linked to a larger value asset (*e.g.* property) the lender gains confidence they can recover their debt. To confirm confidence the lender needs a clear legal right to sell the asset to recover the debt, which in turn presents risk for the recipient.
Solar leasing	Whereby a solar customer enters into an agreement to defer the system capital cost and repay it via a fixed recurring payment or over a fixed term, and including a financing rate of interest.
Statistically low income households	Households with a combined weekly income of $600 or under (ABS).

3 Document information

Document title	Solar Rates Business Case
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4 Executive summary

This business case report presents an independent and objective analysis of the costs and benefits of a state-wide solar finance program that assists low income households in Victoria to access solar photovoltaic (PV) systems. The project analyses the economic, regulatory and technical viability of council rates charges and other low income solar finance options, develops a recommended program model, and establishes its business case.

This report has been commissioned by the Eastern Alliance for Greenhouse Action (EAGA), a formal Alliance of seven councils in Melbourne's east. EAGA has partnered with the Northern Alliance for Greenhouse Action (NAGA) and engaged the Moreland Energy Foundation (MEFL) to deliver the project on behalf of all Victorian Greenhouse Alliances, with funding by the Victorian Government through the Department of Environment, Land, Water and Planning (DELWP). The project supports one of ten priority actions in EAGA's *Climate Change Adaptation Roadmap*.

The key findings of the analysis include (but are not limited to):

- **Current finance not suitable**
  Whilst there is no shortage of finance for renewable technologies, the terms of current finance products exclude low income segments of the community, who are most vulnerable to energy hardship, from accessing solar PV systems.

- **Governments have a role**
  Local and state governments have a key role to play in addressing this market failure, catalysing investment and supporting and scaling low income solar finance programs. A state-wide low income solar finance program has the potential to deliver immediate net savings of around $10-30 per month on electricity costs for large numbers of low income households, materially reduce Victorian Government concession payments, and meet broader social and environmental policy objectives.

- **Low interest rates key to household benefit**
  The interest rate (cost of finance) and repayment term have the most material impact on the economic viability of low income solar finance. A 5% interest rate is considered the threshold and long repayment terms (e.g. 10 years) are key.

- **Default risk critical to interest rate**
  The interest rate is critically influenced by the risk that the money will not be recovered. This risk is reduced where security such as property or a default guarantee (e.g. by a government) is available. Managing default risk appropriately for low income households is critical to achieving net benefit.

- **Greatest benefit for home owners with high daytime energy use**
  Low income households who have high daytime energy use (and can hence benefit from solar PV), are easily identifiable, likely to participate, have sufficient numbers for program viability and ideally receive co-benefits (*e.g.* improved health) are best suited for participation. Pensioners who own their home were identified as the key segment meeting these requirements. Once successfully demonstrated, the program model may be modified to meet the needs of other low income households facing additional barriers, such as renters.

- **Council rates charges a practical model**
  The recommended finance model is a council rates charges scheme, which utilises the rates scheme as a loan repayment mechanism for eligible homeowners. This model can deliver favourable terms to borrowers, while providing confidence to lenders through asset security,

statutory charges and the capacity to transfer debt to new property owners. The Darebin Solar $avers pilot demonstrated the mechanism's success.

- **Reform would enable a rates program to scale**
  A council rates charges mechanism, while viable under current legislation, could be significantly enhanced through amendment to the Local Government Act 1989 to streamline the application of rates charges (obviating the current two month approval delay) and enable 'off balance sheet' finance similar to recent Environmental Upgrade Agreement legislation.

- **Shared services can improve program efficiency and effectiveness**
  A shared services approach is recommended to improve efficiencies, leverage economies of scale, and access dedicated capability through existing service providers and partners. Efficient program design needs to ensure a simple, logical and trustworthy process for householders.

- **Private finance possible but needs government to cover default risk**
  Private finance, underwritten by a Government guarantee, could provide an alternative approach and allow state-wide access where Council participation is constrained, however higher interest rates would reduce the range of households able to benefit. The Victorian Government would need to have the willingness and capacity to establish a default fund to provide investor confidence.

The report recommends EAGA and its partner Greenhouse Alliances:

I. Fast track a regional council rates charges program targeting rates paying pensioners, under existing legislation
II. Adopt a shared services approach to access dedicated capability, leverage economies of scale, and reduce resources required from and risks to councils
III. Advocate for changes to the *Local Government Act 1989* to streamline the application of rates charges and enable 'off balance sheet' finance similar to recent EUA legislation
IV. Explore an alternative or complementary private sector finance pilot, pending the capacity and willingness of the Victorian Government to provide a default fund
V. Pursue Victorian Government funding to develop and pilot a regional council rates charges program
VI. Advocate for Victorian Government policy development to support development of a state-wide program to support low income households to access the benefits of solar PV
VII. Seek to establish a local-State government partnership to develop the pilot regional council rates charges program and establish greater capacity to deliver complementary sustainable energy and energy efficiency services to households.

5 Introduction

Victoria's councils and Greenhouse Alliances increasingly recognise the importance of policy and government intervention to address market failures around renewable energy and energy efficiency uptake, particularly for low income and vulnerable households. Improving equity around solar photovoltaic (PV) uptake requires partnerships between local and State governments and the private sector to overcome barriers such as upfront costs, long payback periods and tenancy arrangements (landlord-tenant split incentives).

This *Solar Rates Business Case* project progresses this objective by establishing the business case for a regional solar finance program. By demonstrating the technical, financial, implementation and policy feasibility of a finance model, local government can advance the case for a regional pilot that can then be rolled out across Victoria, thereby accelerating the uptake of solar PV by low income households.

5.1 Background

Rising electricity prices make Victoria's one million low income households increasingly vulnerable to energy hardship and poverty and exacerbate social disadvantage (Baldwin *et al.*, 2015, p.4; EV 2015). The cost of energy dictates that some low income households go without essential services such as heating and cooling, even during climate extremes, with flow on health ramifications. Solar PV systems can provide clear benefits by reducing their exposure to energy prices and allowing them to cool their homes during heatwaves without fear of 'price shock'. However real and perceived barriers around upfront investment cost and credit access limit low income householders' solar uptake, despite its ability to reduce energy costs (Baldwin *et al.,* 2015, p.5). The present market environment does not match the needs of low income householders well; current market finance options either exclude based on earning capacity, have terms that reduce or remove the net benefit of lower energy costs, or require asset security. To ensure low income households can participate in solar PV and energy efficiency action, low risk finance models are required to unlock investment and stimulate uptake.

There are a number of potential finance models for this. One that has attracted widespread interest in Australia is the capacity of councils to apply specific charges to individual rates to recover expenses or debt, providing a special benefit to eligible households at low risk. Schemes in New Zealand and California have been established at scale to support regional programs with significant benefits. In 2014, the Darebin Solar $aver program pioneered the use of the existing *Special Charges Scheme (Sec 163)* of the *Local Government Act 1989* to apply a charge for around 300 pensioner residential homeowners to repay a solar system. This enabled participants to access low risk finance and gain an immediate net benefit (positive cash flow), with demonstrated success as a simple and trustworthy form of finance for low income households.

With the success of projects like Darebin Solar $aver and Victorian policy shifting towards a greater focus on renewable energy, energy efficiency and low income households, it is timely for local and State governments to consider the potential to scale up rates based finance and explore other low income solar finance models.

5.2 About this project

This project establishes a clear business case for low income solar finance supported by local government that assists low income households in Victoria to access solar PV and potentially energy efficiency measures. EAGA, a formal Alliance of seven Councils in Melbourne's east[1], has partnered with the Northern Alliance for Greenhouse Action (NAGA) and engaged the Moreland Energy Foundation (MEFL) to lead a consortium to deliver the project on behalf of all Victorian Greenhouse

[1] Including the City of Boroondara, Knox City Council, Maroondah City Council, City of Monash, City of Stonnington, City of Whitehorse and Yarra Ranges Council.

Alliances, with funding by the Victorian Government through the Department of Environment, Land, Water and Planning (DELWP). The project supports the achievement of one of ten priority actions within the EAGA *Climate Change Adaptation Roadmap*.

Scope

The project is tasked with:

> *…quantifying the costs and benefits of different implementation models and determining the technical and economic viability of the proposed program.*

The analysis focusses on solar PV because of its ability to deliver immediate net financial savings to low income households, however it is recognised that energy efficiency measures could be coupled with such a program. Indeed, any low income solar finance program should consider these additional opportunities, which could be supported through supplementary program funding, upfront expenditure by participating households or (where the net financial savings from solar PV are sufficient) reduced household cash flows.

Evaluation

Using a combination of financial, demographic and technical modelling, stakeholder interviews, case studies, and a review of key policies and reports, MEFL, EAGA and NAGA have assessed the viability of different potential models for council supported low income solar finance against four key criteria:

- **Benefit to low income households**
  Low income solar finance reduces energy costs only when the householder can use their solar energy during the day; a viable model must therefore target households with a *high daytime energy use*. Furthermore, to make an appreciable impact on the sector, the model must target a market segment with *sufficient scale*, who are *easily identifiable* and *likely to participate* in the program. Environmental and resilience *co-benefits* would also be valuable.

- **Low interest and low risk**
  The model must deliver immediate reductions to households' energy costs that exceed the cost of finance (that is, be cash flow positive). This relies on the model being able to provide *low interest rates* and *long repayment periods* to the household, while providing *confidence* to the lender that they can recover the debt in case of default.

- **Efficient program design**
  The model must involve a *simple and logical process* with minimum transactions, so that it offers an *accessible* and *trustworthy* option for householders and thus enables adequate participation levels. In addition, the model should be *scalable* to increase its reach and leverage economies of scale in procurement, administration, quality assurance and service delivery. The model should also incorporate robust quality assurance and risk management mechanisms. These components will together ensure an efficient and manageable model for Councils to opt into.

- **Policy support**
  The model must be *viable under current legislative, funding and regulatory settings* so that it can be implemented in a timely manner. Through *robust and practical demonstration* the model can strengthen the case for program expansion, policy improvements and the exploration of other potential models.

Outputs

This report presents the results of the analysis in plain English. It should be used in conjunction with the Solar Rates Business Case Tool, also developed as part of the project. The tool allows local governments and Alliances to explore the size of potential markets in their municipality and/or region. It also enables the user to test program options and estimate their potential financial and

environmental impacts on participating households[2]. The user can enter details of possible program designs, including the number of participating households, interest rate, repayment term and intervals (*e.g.* quarterly repayments over 10 years), average tariff and unit costs of solar systems. The tool then estimates the average financial, energy and greenhouse emissions benefits overall, and by household type, energy consumption profile (demand) and system size.

This report, the Solar Rates Business Case Tool and other project outputs will together be used to:

- Inform decisions by the Alliances about their preferred low income solar finance program model/s to pursue
- Inform decisions by individual councils on whether to participate in and support the delivery of a low income solar finance program
- Form the basis of a grant application to the New Energy Jobs Fund to support a low income solar finance program to establish its working feasibility at scale
- Provide an evidence base to secure support, funding and resources from the State, financiers and other stakeholders and partners to assist in implementation.

5.3 How to use this report

The 'Benefit to low income households' chapter first outlines why low income households need solar finance generally, before analysing potential market segments in terms of their daytime energy use, scale, ease of identification, likelihood of participation and potential co-benefits.

The 'Low interest and low risk' chapter evaluates different finance models in terms of their ability to deliver net cash flow positive outcomes to borrowers and their viability for lenders. Using modelling, stakeholder interviews and case studies, it examines three potential finance mechanisms, including council rates charges, private finance and Government loans.

The 'Efficient program design' chapter discusses ways the models can meet the needs of and enable participation by households and Councils. Regional coordination, bulk procurement, partnerships with existing providers and shared services approaches are also assessed in terms of their ability to deliver a simple and logical process with minimum transactions, offer an accessible and trustworthy option for householders, and leverage economies of scale in procurement, administration and service delivery.

The 'Policy support' chapter considers the current robustness of each finance model under existing legislative, funding and policy settings, as well as opportunities for policy improvements to support program expansion and the exploration of those models.

Based on the analysis, the 'Conclusion and recommendations' chapter suggests next steps for EAGA and its partner Greenhouse Alliances to progress low income solar finance in Victoria.

[2] Note the tool is designed to provide indicative results and should not be used as the sole basis for the design or business case of a low income solar finance program.

6 Benefit to low income households

Solar PV reduces energy costs only when the householder can use their solar energy during the day; a viable model must therefore target households with a high daytime energy use. Furthermore, to make an appreciable impact on the sector, the model must target a market segment with sufficient scale, who are easily identifiable and likely to participate in the program. Co-benefits from participating in the program, such as greenhouse gas emission reductions and improved resilience would also be valuable.

This chapter of the report first outlines why low income households need solar finance generally, before analysing potential market segments in terms of their daytime energy use, scale, ease of identification, likelihood of participation and potential co-benefits from solar finance. The analysis suggests the market segment meeting all of these criteria are rates paying pensioners (homeowners who receive a Municipal Rates Concession). It also identifies other low income household segments that a low income solar finance program could be modified for and rolled out to in the future, provided their particular needs and barriers can be addressed.

6.1 Why low income households need solar finance

Defining low income households and energy hardship

While the Australian Bureau of Statistics (ABS) define 'low income households' as having a weekly income of $600 or under, the relationship with household energy patterns and costs are obviously more nuanced. For example, while more than 420,000 Victorian households have a weekly income of $600 or under (ABS 2011), about 880,000 households accessed the state energy concession for electricity in 2011/12, and 810,000 accessed the gas concession[3]. By 2021/22 up to one million Victorian households could be eligible for energy concessions. By any measure, this represents a considerable proportion of our community.

The Essential Services Commission recently concluded the 'energy hardship' label requirement for assistance is arbitrary and misplaced (ESC 2015). Energy hardship is caused by a conjunction of factors – low income, energy prices, the condition of housing[4], and the capacity to adopt different household practices to manage energy use given its size, composition and needs (Chester 2013).

'Low income' and 'vulnerable' households are therefore defined according to the purposes of the given report or program. For the purposes of this report, a distinction is made between:-

- *Statistically low income households* (with a weekly income of $600 and under as per the ABS), used in the project's technical and economic modelling, and
- *Potential low income target market/s*, that is, households that would benefit from a low income solar finance program due to their vulnerability to energy hardship, high daytime energy use, large scale, ease of identification, likelihood of participation and potential co-benefits from solar finance.

Low income households are vulnerable to energy hardship…

Statistically low income households spend proportionally more of their gross income on energy (including transport), at an average $77 per week in 2011 (ABS 2013). Low wealth households spent $72 per week (ABS 2013). Households that received most of their gross weekly income from a government pension spent close to 10% of it on energy (at $61 per week, or 9.9% of income - half each on home energy and vehicle fuel). This was around twice that for other households regardless of their main source of household income (ABS 2013).

[3] http://www.budget.vic.gov.au/CA2579B200132B63/WebObj/BP5Ch5Word/$File/BP5Ch5Word.doc p194

[4] For example, 86% of homes in Victoria were built before 2005 when the 5-star standard was introduced (EV 2015).

Such households are more vulnerable to energy bill stress and energy poverty. Melbourne electricity prices rose by 84% between 2008 and 2012 (EV 2015), increasing vulnerability to energy hardship and poverty and exacerbating social disadvantage (Baldwin *et al.* 2015, p.4). Low income households typically respond to rising energy prices by cutting back on food purchases, further education, doctors' visits and medicine, social participation, showers, television, having visitors, and also only heating one room (sometimes all sleeping in one room) and going to bed early and fully clothed (Chester 2013, various submissions to Senate Select Committee on Energy Prices, September 2012). They are particularly vulnerable to heatwaves and the winter cold.

…and show interest in participating in clean energy programs

Low income households appear interested in clean energy, and householders who spend relatively more of their income on energy are more likely to take up solar. For example, the top 10 Victorian localities taking up solar under the Renewable Energy Target all had below average income levels, a trend consistent across Australia (Green Energy Trading 2014, p.5). The main motivation to install across all income groups is individual cost savings (70%), followed by environmental benefits (12%) and taking advantage of Government rebates (10%) (CSIRO 2013).

Access to finance is however a barrier

Many low income households face real and perceived barriers that limit their access to solar, including the upfront investment cost and credit access constraints (Baldwin *et al.,* 2015, p.5). The present market environment does not match the needs of low income householders well; other segments of the market have more access to upfront capital or the ability to finance through more established channels.

6.2 Target market characteristics

While the need for low income solar finance can clearly be seen, to be viable a program model must identify and target a segment/s of the low income households market that have a high daytime energy use (and can hence benefit from solar), sufficient scale, who are easily identifiable, and likely to participate, and ideally receive co-benefits from program participation.

High daytime energy use

Solar PV is beneficial to those households who can use the solar energy during the day. Good alignment between electricity consumption profiles (when they consume energy) and solar generation profiles can result in substantial reductions in grid electricity demand. This is important because battery storage is prohibitively expensive at present, and the current feed in tariff for solar is 6.2 c/kWh (and due to decline to 5 c/kWh from 1 January 2016) - well below the market cost of purchasing energy.

Daily solar generation in Melbourne - and Victoria more broadly - clearly peaks at the middle of the day (illustrated in Figure 1 below). Groups who are at home and using energy during this peak time are therefore the groups to target. Targeting households who are often home during the day also helps them to alleviate the financial burden of being unable to load shift, particularly for heating and cooling requirements.

Understanding the energy consumption profiles of different market segments is thus essential. Figure 2 below shows that the groups most likely to use electricity during the middle of the day (when it is sunniest) are retirees, followed by families with one parent staying at home. Other demographic groups such as singles, couples and families where both parents work have 'peakier' morning and evening consumption which does not match solar output nearly as well.

Data from the Darebin Solar $avers program illustrates the ability of solar PV to reduce the requirement for costly mains electricity by households with high daytime energy consumption. Figure 3 below charting ~120 pensioner householders who participated in the program shows a massive decline in average mains electricity demand (in the middle of the day and overall) following the installation of solar. The program resulted in an average 32% reduction in household electricity consumption after installation. Moreover, 83% of households reported savings on their electricity bills of 20% or greater.

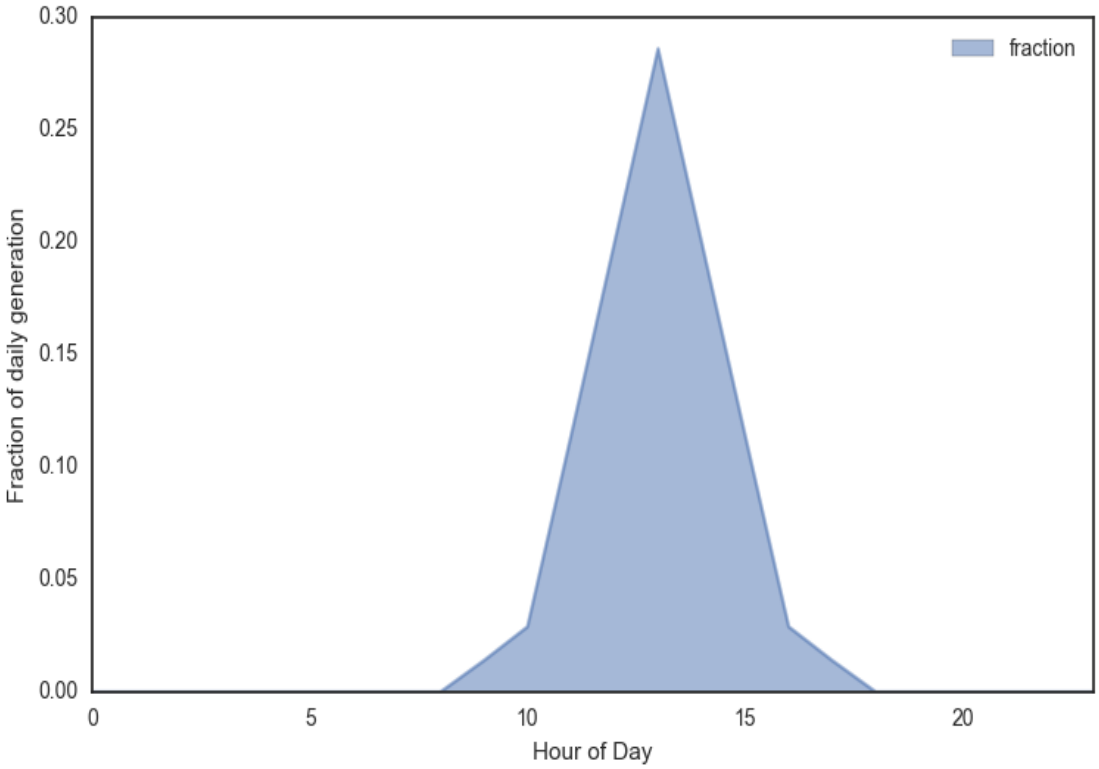

Figure 1: Solar generation peaking at midday

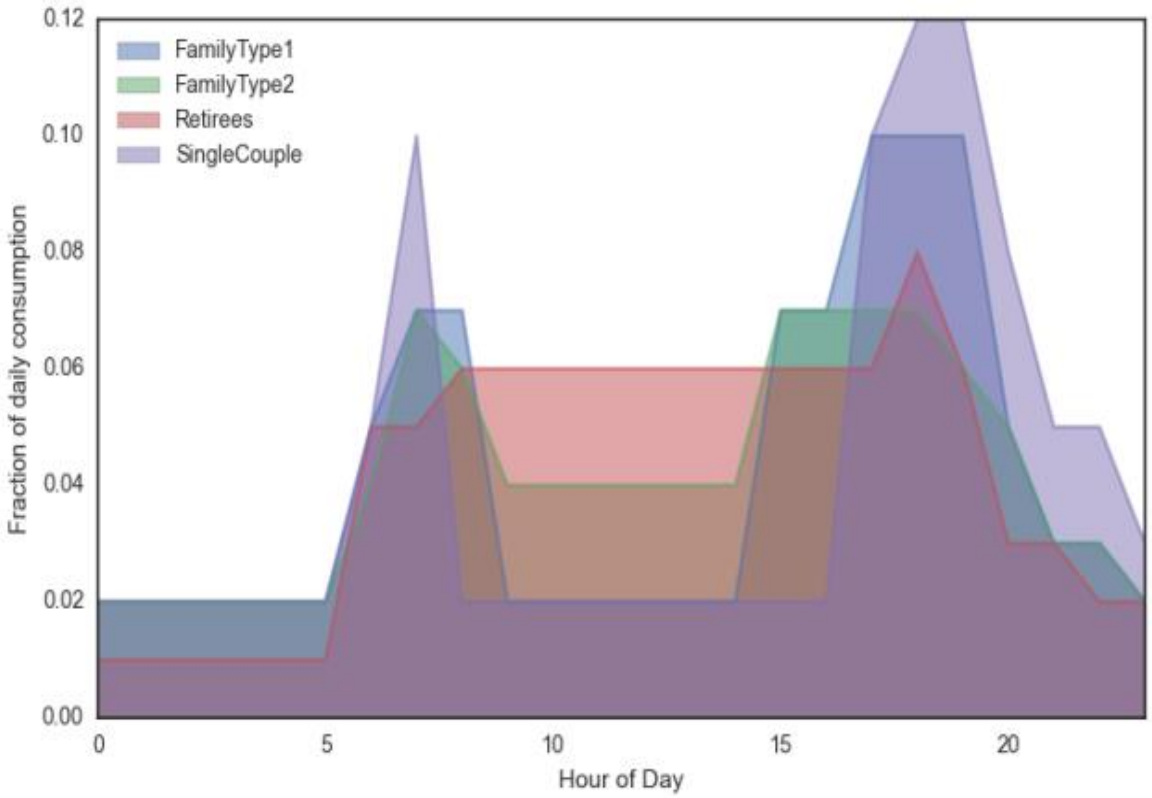

Figure 2: Comparative daily energy consumption of families (type 1- both parents working; type 2- one parent staying at home), retirees, singles and couples (average profiles assumed in modelling)

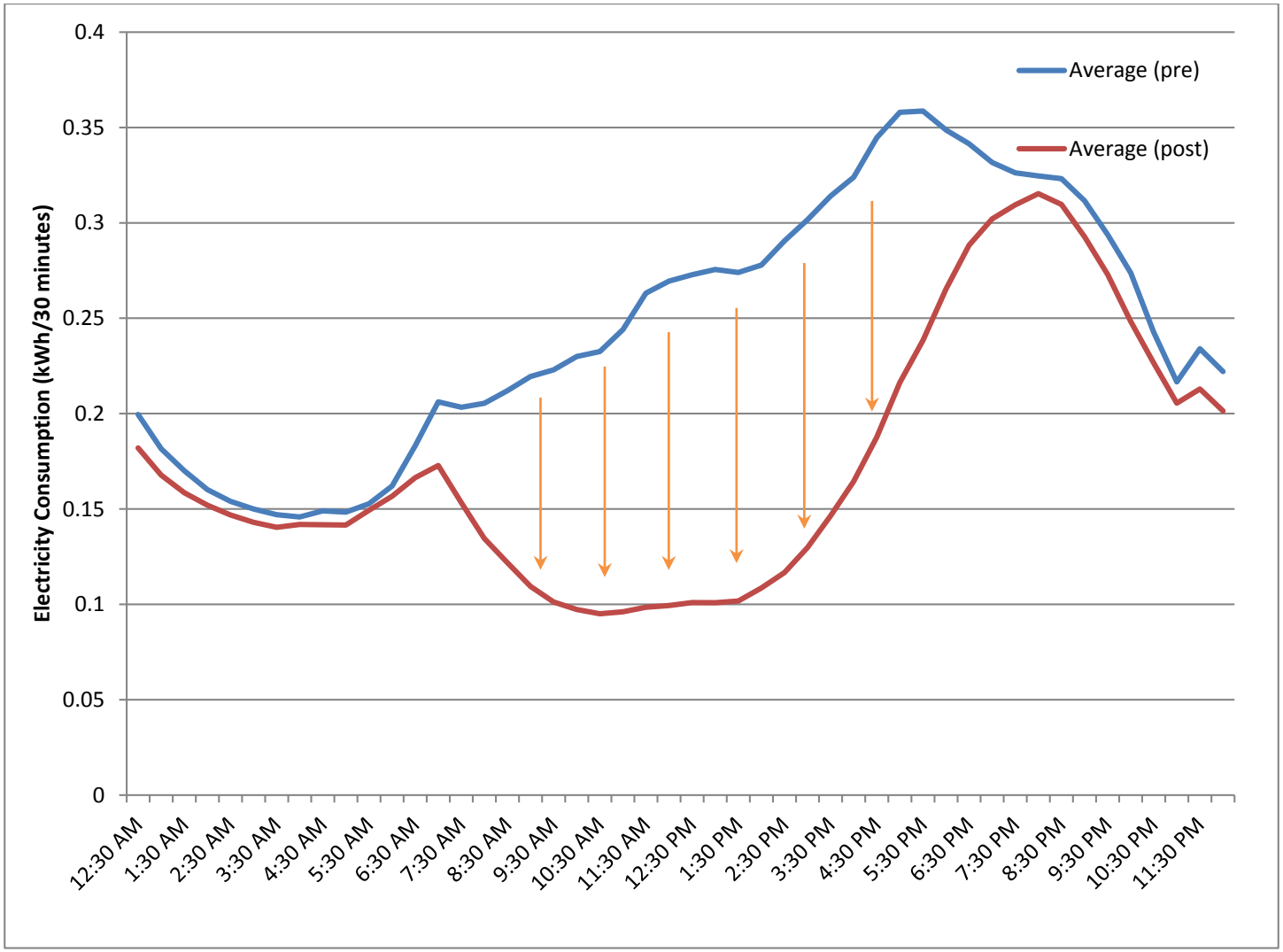

Figure 3: Average daily grid electricity demand before ('pre') and after ('post') installing solar PV

Sufficient scale

For a solar finance program to be worthwhile it must be able to create benefit for an appreciable number of low income households. Having sufficient numbers of similar households also enables economies of scale in program design, procurement, administration and especially recruitment. Scaled programs are particularly important for smaller local government areas (LGAs), who on their own may have insufficient catchment to justify a stand-alone program. In these cases a regional or state-based scheme would be the only way those households could access affordable solar finance.

Ease of identification

Being able to easily identify a market segment is important in several respects. First, to confirm the market segment has sufficient scale for a viable program. Second, to develop a greater understanding of the households' needs, barriers and potential program interest with regard to solar finance in order to tailor the program design. Third, easy market identification is important for successful program promotion and recruitment.

Likelihood of participation

Understanding a potential market segment's needs, barriers and potential program interest assists in prioritising household types likely to trust and uptake the program model.

Co-benefits from program participation

Whilst the principle objective of low income solar finance is to reduce their electricity costs, many co-benefits are possible, such as greenhouse gas emission reductions and improvements to health, thermal comfort and social outcomes. Quantification of the associated economic benefits has not been considered here, but is expected to make the overall case more compelling.

6.3 Potential target market segments

Market analysis indicates certain potential market segments match the above criteria more than others, and would therefore make good candidates for immediate demonstration of the viability of low income solar finance. Other household types will require further work to establish the feasibility of targeting, including their potential to benefit from solar, ability to be identified through government databases or referral, capacity to afford repayments and other considerations.

Pensioners who own their home (recommended target market)

As shown above, pensioners and retirees generally have high daytime energy consumption profiles and would thus benefit from solar PV. Pensioners who own their home are also easy to identify and target through Council databases; to receive a Municipal Rates Concession they must hold either an Aged Pension or Veterans Affairs concession card. There is also the potential for referral from culturally and linguistically diverse (CALD) services and government databases.

There is firm evidence this market segment would be interested in participating in low income solar finance. Owner occupiers, residents over 53 years, and households with income from Australian Government pensions are all positively correlated with PV uptake (ACIL Allen 2013). Significantly, the Darebin Solar $avers program achieved an impressive 292 contracts signed in less than three months, from 600 expressions of interest and ~7,000 original Council letters promoting the scheme (see Case study 1 for details).

This segment is more likely to experience specific vulnerabilities that enhance their need for and potential co-benefits from a low income solar finance program. Examples of such vulnerabilities include health conditions and age, language and/or cultural barriers (by older generation migrant households) that impede access to more traditional forms of finance.

Financially, pensioner homeowners' set income makes the upfront cost of solar PV prohibitive. For example, a survey of 440 pensioners in the City of Darebin found 73% cannot afford the upfront cost of solar PV. However as homeowners, pensioners' asset reduces their credit risk and increases their security, enabling lower interest rates and longer repayment periods. This important consideration is discussed in detail in the 'Low interest and low risk' chapter.

Finally, pensioners who own their homes have sufficient scale for a regional (or state-wide) program. The numbers of Municipal Rates Concession recipients are considerable and justify regional schemes in both EAGA and NAGA council areas (see Tables 1 and 2 below). Indeed, with nearly 405,000 Municipal Rates Concession recipients in Victoria, a state-based scheme would also be feasible. The Solar Rates Business Case Tool, developed as part of the project, allows local governments and Alliances to explore the size of potential markets in their municipality and/or region.

Table 1: Municipal Rates Concession recipients in EAGA

LGA	Municipal Rates Concession recipients	As % of households in LGA
City of Boroondara	5,950 households	9% of households
Knox City Council	11,259 households	20% of households
Maroondah City Council	7,841 households	19% of households
City of Monash	13,500 households	21% of households
City of Stonnington	3,503 households	7% of households
City of Whitehorse	10,972 households[1]	18% of households*
Yarra Ranges Council	11,313 households	18% of households
EAGA	64,000 households	Average 16% of households

[1] Note figures for the City of Whitehorse are estimates.

Table 2: Municipal Rates Concession recipients in NAGA

LGA	Municipal Rates Concession recipients	As % of households in LGA
City of Melbourne	1,045 households	2% of households
Moreland City Council	12,099 households	19% of households
City of Yarra	6,577 households[1]	18% of households
Darebin City Council	10,425 households[1]	18% of households
Banyule City Council	8,839 households	18% of households
Nillumbik Shire Council	2,813 households	13% of households
Whittlesea City Council	13,500 households	25% of households
Hume City Council	12,215 households	21% of households
Manningham City Council	7,593 households[1]	18% of households
NAGA	Total 75,000 households	Average 17% of households

[1] Note figures for the LGAs of Yarra, Darebin and Manningham are estimates.

Renters

Renters often live in energy inefficient homes and are unable to upgrade them. While this market segment likely has sufficient numbers to justify a program, working with this group will require navigating significant barriers around split-incentives, requiring permission to act, short-term tenure, body corporate requirements (where the renter lives in a multi-residential dwelling), lending risk (given no home asset security), and the risk of inability to pay. In addition, mechanisms for identifying and referring this group will need to be established.

Households requiring heating/cooling for sickness

The market segment is potentially quite promising. Recipients of the Life Support Concession, Medical Cooling Concession or Disability Allowance are definable through government databases and referral from social service organisations. Partnerships would therefore be required with these organisations to access information. They are also highly likely to be at home during the day (so would benefit from solar PV) and in many cases have limited mobility, increasing their vulnerability to heat health risks. In the case of Medical Cooling Concession recipients, their health condition (*e.g.* multiple sclerosis, lymphoedema, Parkinson's disease, fibromyalgia, post-polio syndrome/poliomyelitis or motor neurone disease) requires high levels of cooling even on non-heatwave days. These health vulnerabilities create clear co-benefits from access to affordable energy and particularly affordable cooling. The interest and ability of this group to participate in low income solar finance at scale would need to be scoped.

Households under mortgage stress

Mortgage stress is generally defined as when housing costs exceed 30% of the household's income. While not necessarily low income as defined by the ABS, this group is vulnerable to energy hardship. Such households could be referred from financial counselling services and are often location specific (potentially definable by postcode). While social co-benefits could be expected through the alleviation of financial pressure, this group might be reluctant to take on additional debt.

Households with credit risk

This group is less specific to location than households under mortgage stress, and access would rely on referral from financial counselling services, with numbers of eligible and interested participants expected to be low. Existing finance options tend to manage the high risk of perverse financial outcomes to this group (*e.g.* increased debt burden, inability to pay) by containing the loan amount, interest rate and/or repayment term - something incompatible with solar PV. These concepts are discussed further in the 'Low interest and low risk' chapter and Case study 2 in particular.

CALD communities

Migrant households and second or third generation households are potentially definable through referral from CALD services. The interest and ability of these groups (ideally broken down by CALD community) to participate in low income solar finance at scale would need to be scoped. Additional mechanisms would be required to overcome potential language, cultural and trust barriers to accessing low income solar finance. Previous engagement with CALD communities on sustainable energy projects has shown that working with peer networks is the most effective recruitment mechanism, so partnerships with CALD organisations would be essential.

Those who are home all day and unable to load shift

A number of different groups are home all day and unable to load shift, such as unemployed householders, shift workers, disabled householders and young families. While these groups would each likely benefit from solar PV, they would be difficult to identify and reach without site specific smart meter data. Furthermore, there is great variety within this group, and the interest and ability of each sub-group to participate in solar finance at a meaningful scale would need to be scoped.

Other potential market segments

Households in subregions with higher than normal heating/cooling requirements are easily defined through postcode and would likely experience health co-benefits from more affordable thermal comfort. There are likely sufficient overall numbers to justify a program. It is also worth noting that the highest uptake of solar PV under the RET was by rural and regional households (at 29% compared to the wealthier capital cities at 18%) and the outer metro mortgage belt (Green Energy Trading 2014).

Other potential market segments, such as single income households, single parent households, low net worth households and particularly Health Care Card holders are potentially definable through government databases or postcode. Again, there is great variety within this group, and the interest and ability of each sub-group to participate at a meaningful scale would need to be scoped.

A summary of how well each potential market segment matches the viability criteria is provided in Table 3 below.

Table 3: Comparison of potential target market segments for low income solar finance

Potential market segments	High daytime energy use	Ease of identification	Sufficient scale	Likely to participate	Co-benefits
Pensioners who own their homes	✓	✓	✓	✓	✓
Renters	?	✗	✓	?	?
Households under mortgage stress	?	?	?	✗	✓
Households with credit risk	?	✗	✗	?	✗
Households requiring heating/cooling for sickness	✓	✓	?	✓	✓
CALD communities	?	?	?	?	?
Those who are home all day & can't load shift	✓	✗	?	?	?
Households in regions with high heating/ cooling requirements	?	✓	✓	?	✓
Single income/ parent households	?	✓	✓	?	?

Summary

- There is a clear need for low income solar finance for a wide variety of reasons
- Pensioners who own their homes are able to immediately demonstrate the scalability of a low income solar finance program; they use energy when it's sunny, are easy to target, there are sufficient numbers of such households to justify the development of a program, and they have a proven record of participation
- Once the low income solar finance program model is proven successful with an initial target market segment, it can be extended and modified to address the needs and barriers of other low income groups.

7 Low interest and low risk

Loan finance allows a resident to cover the upfront cost of installing PV, receive the benefit upfront and repay the debt over time. To ensure such finance is feasible, the model must deliver immediate reductions to households' energy costs that exceed the cost of finance (that is, be cash flow positive). This relies on the model being able to provide low interest rates and long repayment periods to the household, while providing confidence to the lender that they can recover the debt in case of default.

This chapter evaluates different finance models in terms of their ability to deliver net cash flow positive outcomes that are viable for lenders. It first introduces the concepts and variables required for financial modelling, before describing the three finance models: rates based mechanisms, private finance and Government loans. The modelling results indicate that asset security, particularly home ownership, is a practical and straightforward way to minimise risk to all parties.

7.1 Key concepts and variables

Net cash flow positive outcomes are critical

The primary aim of low income solar finance is to deliver immediate reductions in households' energy costs through enabling investment in on-site generation via solar PV (and potentially also energy efficiency measures). This is essentially a threshold for the development of low income solar finance; a resident needs to be cash flow positive from the outset under any proposed financing arrangement. This means the cost of finance needs to be lower than the savings from investment. The figures below illustrate how cash investments take time before the householder sees any net benefits (or cash flows) (Figure 4) and are hence not feasible for low income solar finance. In comparison, the finance program proposed provides an immediate and ongoing net benefit due to the design of the interest rate and repayments (Figure 5).

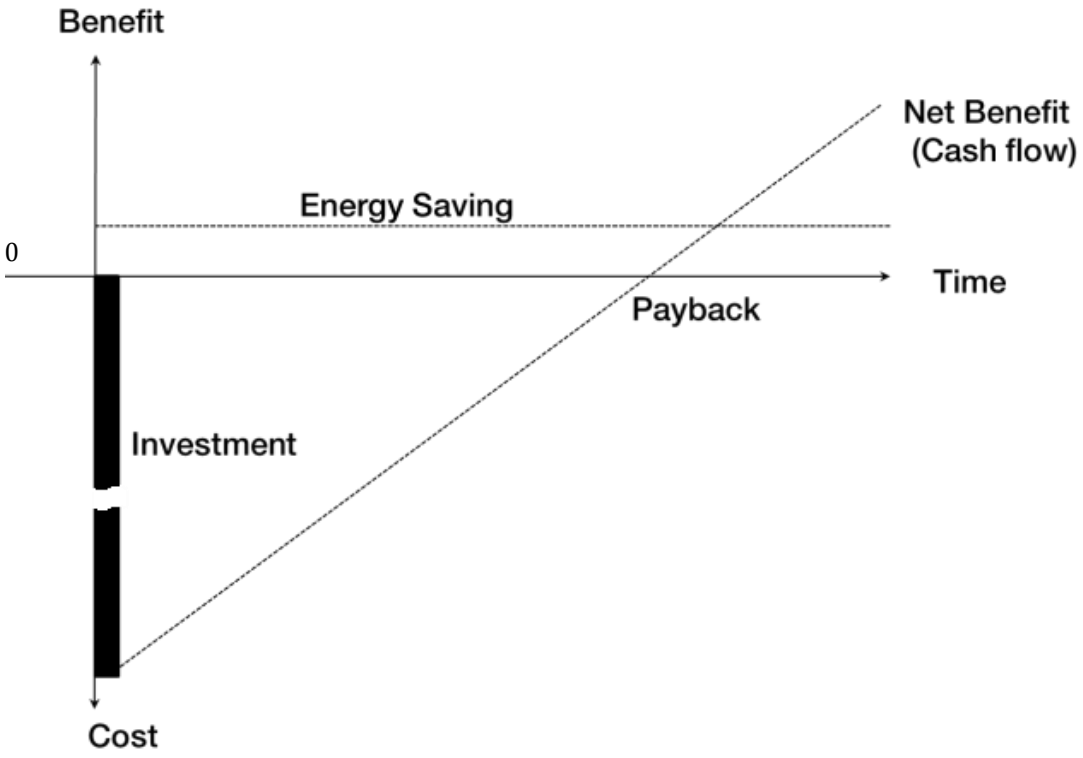

Figure 4: Cash investment

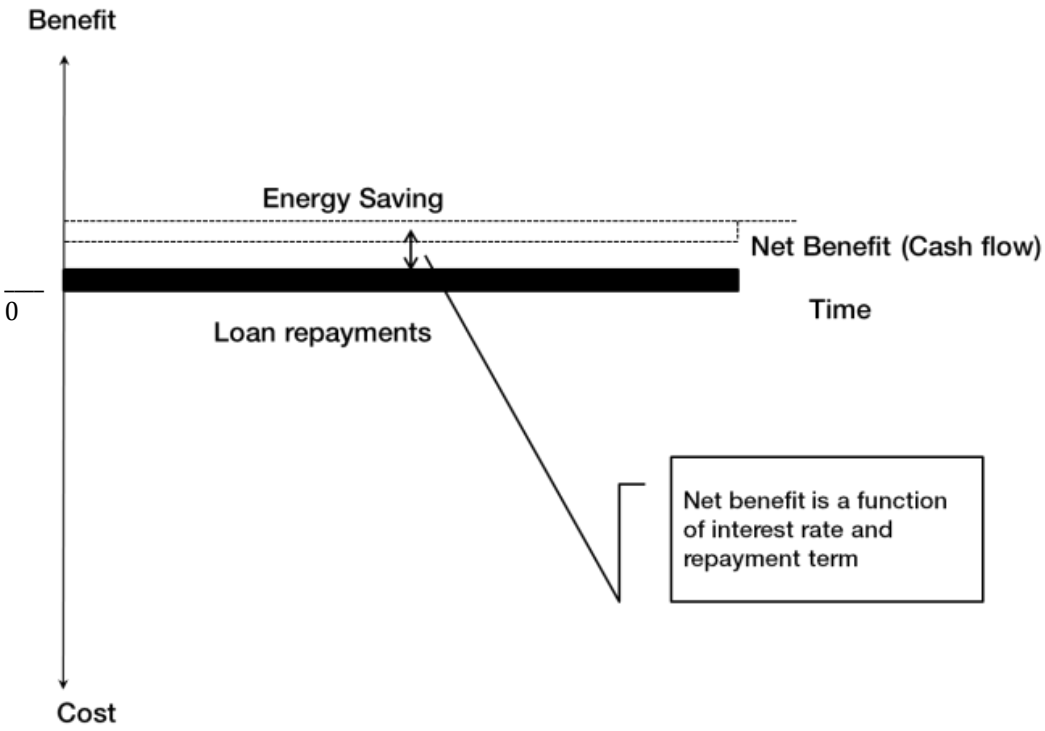

Figure 5: Finance enabling positive cash flow

Factors influencing loan decisions

A number of interacting factors influence the decisions of lenders and loan recipients (Table 4). Some are primarily lender considerations and some are the considerations only of the loan recipient. In short, a cash flow positive scheme requires generous repayment periods (*e.g.* 10 years) and low interest rates to achieve repayment amounts consistently lower than the value of the energy saved by the system and achieve a net benefit across the life of the loan. However, the factors can be traded off with each other to an extent. For example a lower interest rate may afford a reduced repayment period, or a lower capital cost may afford an increased interest rate. Adjustments may also be required for seasonal changes in solar energy generation. Loan repayment amounts may need to be reduced during winter (when solar generation and hence financial savings are lower) and increased over summer (when generation and savings are higher) (Figure 6).

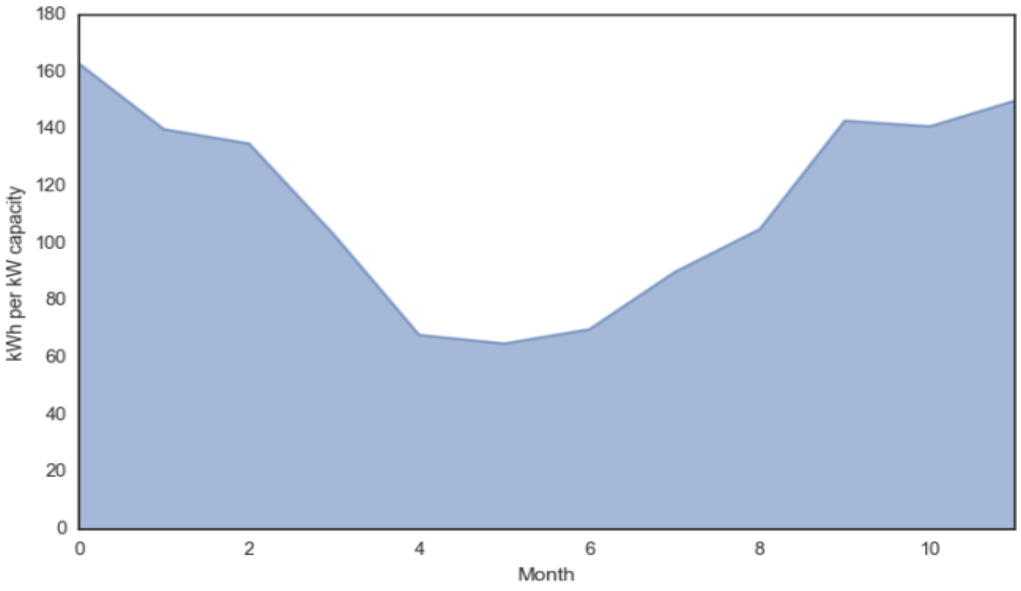

Figure 6: High summer and low winter generation

Table 4: Factors influencing the decisions of lenders and loan recipients

	Lender	Recipient
Interest rate The interest rate reflects the cost of money; the return (or profit) the lender requires and factors in the risk that the money will not be recovered (default). The return depends on the market conditions, security, and the operating objective of the lender (***e.g.*** private finance is specifically seeking a profit, while micro-finance schemes seek a social outcome and forgo profit).	In control of interest rate setting.	Interest + principal required to be less than savings to be cash flow positive.
Repayment period This is the duration of time over which instalments are made to pay back the loan principal and interest. A shorter term reduces the risk to the lender in recovering the debt and hence can lower the interest rate. A longer term allows the borrower to spread out repayment, reducing the amount of each instalment and potentially enabling cash flow positive outcomes. However, where interest is compounded over a longer term a larger total interest payment will accrue. A balance needs to be reached between interest rate and the repayment period to achieve benefit for the borrower and cover the lender's risk.	Shorter repayment period reduces risk of default in absence of security	Longer period can reduce instalment amount though may mean a larger total interest payment
Credit risk The credit risk is the lender's judgement of the capacity of the loan recipient to meet regular or scheduled payments. Low income or disadvantaged residents may have a high credit risk due to low fixed income and employment status. This can render this group ineligible for finance or prey to 'loan sharks' who require a significant interest rate premium to cover the risk of default.	Increases the interest rate to cover for credit risk	n/a
Security Security provides the lender some capacity to recover their money in case of default. A mortgage is a common example of where the lender has rights to the property commensurate to the outstanding debt. The key issue with assets that depreciate in value (*e.g.* cars) is their resale value is less than their purchase value and the lender may not be able to recover the outstanding debt. Where debt can be linked to a larger value asset (*e.g.* property) the lender gains confidence they can recover their debt through the resale of the larger value asset. To confirm confidence the lender needs a clear legal right to sell the asset to recover the debt, which in turn presents risk for the recipient. Solar PV involves a typical depreciation and removal costs, so provides low security to a lender.	Require a high value asset as security	Low income households may have no asset or put this asset at unreasonable risk
Capital cost This plays a major role in determining loan size and finance costs, and will depend on system size (determined by load and generation profiles), type and quality (which affect indirect costs such as maintenance requirements). Additional costs that may be required include electricity meter board upgrades for older homes (~$700), and smart meter installation (if not already in place, ~$350 to $450). Fees may apply for non-standard installations, such as two-storey homes, tiled roofs, difficult to access locations, homes with long distances between a north-facing roof and the electrical switchboard, flat roofs or roofs with inappropriate pitch, or insufficient north-facing roof space. There is a wide range in retail prices; national suppliers indicate bulk purchasing can reduce the individual system cost by 10-20% (subject to scale) through potential avoidance of the supplier's promotion and coordination costs.	Reduction in capital cost reduces principal amount	Reduction in capital cost reduces instalments
System size / energy generation Appropriate system sizing will depend not only on the household's energy consumption profile and total load, but also on physical constraints such as roof size, orientation and shading.	Influences capacity of client to repay	Influences net benefit
Energy consumption profile and daily load The loan recipient's energy consumption profile needs to match the solar generation profile to achieve electricity cost savings that have the possibility of exceeding finance costs (discussed in the 'Benefit to low income households' chapter).	Influences capacity of client to repay	Influences net benefit

7.2 Finance mechanisms

Council rates charges (solar rates)

Council rates charges mechanisms involve councils providing individual loans to households and recovering their costs through the rates scheme. Any outstanding debt is tied to the property title and allows the council to recover debt (with accrued interest) when the property is sold. The program can be promoted by the council directly. It has a lower cost of capital due to the security (low risk) of the loan, the statutory nature of charges and its attachment to the property. In Victoria, this can occur through use of the *Special Charges Scheme (Sec 163)* of the *Local Government Act 1989* to provide an effective 'zero upfront cost' finance offer to low income households. Examples of such schemes include the Property Assessed Clean Energy (PACE) program in the US (see Case Study 4), the Voluntary Targeted Rates (VTR) scheme in NZ (Case Study 5), and Darebin Solar $aver project in Victoria (Case Study 1). They are also relatively simple for householders to understand and engage with, and the involvement of councils increases trust. Stakeholder discussions indicate councils generally remain open to this option and accept the transaction in principle.

Case study 1: Darebin Solar $aver

This innovative and replicable project applied a Special Rates Charge to enable pensioner homeowners to install solar PV. Households were provided with energy efficiency advice and an offer of solar PV, which is repaid through a special charge attached to the property. Council permitted additional work such as switchboard upgrades to be included in the Special Charge. Legal advice indicates other renewable energy or energy efficiency 'fixtures' could also be included. The finance model advantages included use of existing systems, provision for asset and debt transfer to new property owners, and increased household and business confidence in investment. Disadvantages included legal issues, administrative complexity (especially with a one off rollout) and additional complexity for the ratepayer. The project delivered an average $100 saving per household per year on electricity, with one in two households now less concerned about rising electricity prices.

Key features

Eligibility	Pensioner homeowners who paid concession rates in the City of Darebin
Loan amount	Capped by system size (2 kW); average $3,000 and max $3,800 (incl. extra costs)
Interest rate	0%
Term	10 years
Repayments	Paid quarterly via rates charge; no payment required for first 6-8 months to allow householders to cover costs of distributor connection fees
Fees, charges and conditions	Distributor connection fees (~$40-300 depending on network) accommodated by deferral of first repayment to ensure cash flow positive from day one
Warranties	10 years, covering the panels (which also have a 25 year production guarantee), the inverter (not the standard 5 years) and the installation
Transactions	Managed and financed by the City of Darebin, who engaged SunEdison for installations and Positive Charge for phone consultation, site visits, and to facilitate quotation and contract generation
Scale of scheme	$900,000 in finance and 292 installs in concession-card holding households, from 600 expressions of interest
Other features	No GST (thus saving 10%).

For more information see http://bit.ly/1NE9WGL

Private sector finance

There are four general forms of private sector finance potentially relevant to low income solar finance, which depend on the provider and whether or not the debt is secured (*i.e.* if it be linked to a larger value asset such as a property or car). An unsecured loan program would effectively mean Council promotes and coordinates third party finance options to low income households but does not act as guarantor. A secured loan program would involve Council promoting and coordinating third party mortgage arrangements. The four relevant types are:

Third party private	Private, unsecured loans offered by banks, credit unions and other lending institutions
Micro finance	Unsecured finance offered by a social sector agency, *e.g.* Good Shepherd (see Case study 2 below)
Secured finance	Private loan as above where the borrower offers an asset as collateral
Mortgage	Loan where the lender holds title to the asset until paid.

Case study 2: No Interest Loans Scheme and StepUP

Good Shepherd Microfinance (Australia's largest microfinance organisation) manage the No Interest Loans Scheme (NILS), which involves 'circular community credit'. This means when a borrower makes a repayment to NILS, the funds are then available to someone else in the community. Loans can be used for essential goods and services such as fridges, furniture, washing machines, car repairs, some medical and dental services, educational essentials such as computers and text books, and some other items as requested. Good Shepherd Microfinance also provide StepUP, a low interest loan for people on low incomes who have difficulty accessing credit from a bank to help them improve their quality of life. Loans can be held in individual or joint names and can be used for second hand cars or repairs, white goods, furniture, computers, vocational education and medical expenses.

The schemes are funded by $18 million from the Australian Government and $130 million in microfinance capital from NAB, in addition to funding from the Victorian, Queensland and NSW Governments. They have together reached over 170,000 people across multiple states who were previously excluded from mainstream banking access to loans and savings, with repayment rates consistently above 95%. They aim to reach one million people by 2018.

Key features

	NILS	StepUP
Eligibility	Health care card or pension card In current residence for > 3 months Willingness and capacity to repay	Health care card or pension card In current residence for > 3 months Other criteria upon application
Loan amount	$300 – $1,200 (loan limits vary by provider and geographical location)	$800 – $3,000
Interest rate	0%	5.99% fixed
Term	12 – 18 months	Up to 3 years
Repayments	Set up at an affordable amount	Weekly, fortnightly or monthly
Fees and conditions		No fees. A credit check is required
Transactions	Good Shepherd Microfinance coordinate the program and a national network of 257 accredited microfinance providers (community organisations)	Good Shepherd Microfinance workers help eligible applicants to complete the documentation for a loan with NAB
Scale of scheme		No financial limit; in practice constrained by microfinance staff time; each worker supports ~8 successful applications pw.

For more information see goodshepherdmicrofinance.org.au

Note that **solar leasing** and **Power Purchase Agreement (PPA)** options are excluded because they are unable to achieve cash flow positive outcomes for low income households. These options seek to charge for the service of supplying low cost energy, and are in practice variations on private finance with high interest rates due to credit risk and limited security in the asset.

Private sector finance is considered challenging for low income households because they either:

- Offer short repayment periods or low amounts incompatible with the upfront costs of solar
- Generally involve high interest rates incompatible with net cash flow positive outcomes. Stakeholder discussions indicate at least one bank is prepared to offer a 5% interest rate and 10 year repayment period. Given a 5% interest rate is at the upper limit of the benefit window (discussed below), this rate would need to need negotiated down
- Require a new mortgage which pensioners are likely to find unappealing, or
- Rely on Government willingness to guarantee default in order to achieve low interest rates (yet to be established).

It would also be important to establish a structure that is both efficient and non-exclusive to enable an open and transparent procurement process.

Government loan

This option involves a government directly providing finance or funds to underwrite the potential 'first loss' a lender may be exposed to. This enables the lender to have confidence and provide debt at a lower interest rate, but transfers this risk to government, who absorbs this within their program funding. The program could be promoted by other agencies. Assessment and supply of solar PV can be at the household's discretion or through a bulk buy program. Case study 3 gives an example of an existing Victorian program that utilises the model, the Home Renovation Scheme.

State Government loans are considered challenging to develop as low income solar finance because of uncertainty on whether the current scheme will continue under government policy or what appetite might exist for establishing a new scalable scheme. Furthermore, the scheme is relatively small, with approximately 50 successful loan applications per year and a few hundred active loans currently.

Another potential government loan mechanism is income contingent loans (ICLs) (Baldwin *et al.* 2015). An ICL provides financial assistance which is only repaid if and when borrowers reach a certain level of income, in the same way as HECS/FEE-HELP. Costs to the Federal Government would include defaulted loans, and the implicit rate subsidy resulting from the loan having a lower interest rate than the government's cost of borrowing. Marginal collection costs of an ICL are extremely low, at less than 5% of annual revenue (for HECS). The results of modelling show that a $10,000 ICL to homeowners could help finance the next one million solar homes with little or no cost to government (Baldwin *et al.* 2015).

However, the target market in this financial model is individuals and couples between 25-55 years of age who own or have a mortgage on their home, who are less likely to benefit due to uncertainties and variations regarding their daytime energy use profile and broad income ranges considered in the study cited. Furthermore, the Federal Government's appetite for this approach is unknown.

Case study 3: Home Renovation Scheme

The Department of Health & Human Services (DHHS) has for 11 years provided home assessments (via Archicentre) and low interest loans for home modifications to help eligible residents to remain living independently in their own home. The loans have historically been used for health and safety measures and maintenance, but assessments are currently being carried out that recommend measures such as rainwater tanks, energy efficiency measures, solar panels, and solar hot water systems. Hume City Council is currently leveraging this program by providing supplementary funding for solar and energy efficiency measures (*e.g.* insulation upgrades).

Key features

Eligibility	Victorian homeowners with a Health Care, Pensioner or Veterans Gold Card who are either over 60 years, receive a disability support payment, or permanently care for someone with a disability. In addition, they must pass a title search and credit checks, live principally at the home, and (for owners) have minimum 30% home equity
Loan amount	Private renters - up to $2,000 Homeowners (unsecured) - up to $10,000 Homeowners (with mortgage) - $10,000 to $25,000 (Up to $50,000 under special circumstances)
Interest rate	2.55% fixed for 3 years, with option to choose another fixed rate or a variable rate
Term	Up to 15 years, with a further 5 years considered under special circumstances
Repayments	Minimum amount can be negotiated, and together with other monthly commitments (*e.g.* credit cards and existing personal and home loans) cannot exceed 25% of the resident's gross monthly income
Fees, charges and conditions	Unsecured loans involve a minor title search fee (~$16), secured loans also involvement lodgement charges and preparation fees (a few hundred dollars). These costs are incorporated into the loan
Scale of scheme	Approximately 50 per year, a few hundred active loans currently, uncertainty on whether scheme will continue under government policy.

For more information see www.housing.vic.gov.au/home-renovation-service-owners and www.housing.vic.gov.au/home-renovation-loan-owners.

7.3 Modelling

The modelling undertaken for this project compared net monthly savings to low income households under six different hypothetical financing options. Appendix A provides detailed model assumptions but in short they involved:

- Interest rates from 0% to 15% per annum
- Repayment terms of three or ten years
- Different household types, including families (both type 1 where both parents are working and type 2 with one parent staying at home), retirees or pensioners, singles and couples
- System sizes of 2 kW to 5 kW
- Daily energy consumption of 5 kWh/day to 15 kWh/day
- Sensitivity analysis for an increase or decrease to capital costs of $500.

Results

Financial analysis indicates low interest finance can immediately deliver net savings of around $10-30 per month on electricity costs to large numbers of low income households (Figure 7). Overall, the modelling results favour a council rates charges model for delivering net benefits to loan recipients.

The greatest monthly savings were achieved by (in order) the Darebin Solar $aver model (which involved a 0% interest rate) and Low Council Rate model (2.5% interest rate). These models also provided net benefits across most household types, (appropriately sized) systems and consumption levels. The Rates or Government Guarantee (5% interest rate) models were the next most able to deliver net savings (note these refer to different finance mechanisms but for the purposes of modelling were assumed to have the same interest rate and repayment term). The detailed results are summarised in Table 7 above. Note greens indicate savings while reds indicate financial losses.

The results show a significant range in potential financial outcomes for low income households. For example, net savings of up to $44/month possible in the case of retirees with a medium system (3 kW), low capital costs ($500 less) and high energy consumption (15 kWh/day) (Appendix C). On the other hand, the costliest option was a $180/month cost for singles or couples with a large system (5 kW), high capital costs (extra $500) and low energy consumption (5 kWh/day) (Appendix B). It is important to note many of the scenarios modelled are implausible once sizing the solar PV system to match the household's energy consumption and other factors are accounted for. For example the aforementioned costliest outcome simply would not occur, as a household with low energy consumption would invest in a smaller system.

The impacts of various factors on individual household financial outcomes are discussed in turn. For a discussion of the potential aggregated financial and environmental benefits of low income solar finance at a range of program scales refer to the 'Efficient program design' chapter.

Household type and daytime energy use

The modelling confirms that households who use energy during the day (that is, have flatter occupancy profiles) will gain the greatest financial benefit across a range of system sizes, interest rates and repayment terms. This is particularly the case for retirees, as illustrated in Table 5. These results confirm pensioner homeowners as a suitable target market (refer also to the 'Benefit to low income households' chapter).

Table 5: Summary of potential monthly savings to low income household with high daytime energy consumption (retirees) under different finance models and solar PV capital costs

Finance model	Net savings (10 kWh/day use & 2 kW system)	Net savings if the system costs $500 extra	Net savings if the system costs $500 less
Darebin Solar $aver (0% interest, 10 years repayment)	$28/month	$22/month	$30/month
Low Council rate (2.5%, 10 years)	$24/month	$18/month	$27/month
Rates or Government guarantee[1] (5%, 10 years)	$20/month	$13/month	$24/month
Private sector finance - secured (8%, 10 years)	$16/month	$7/month	$19/month
Private sector – unsecured loan/lease (15%, 10 years)	$3/month	-$8/month loss	$8/month
Unsecured microfinance (6%, 3 years)	-$42/month loss	-$63/month loss	-$33/month loss

[1] These refer to different finance mechanisms but share the same interest rate and repayment term.

Interest rate and repayment term

The terms of finance make the greatest impact on net financial outcomes to households, and hence the ultimate economic viability of any low income finance program. The modelling shows the benefit to householders tends to be marginal at interest rates above 5%, although there are some exceptions (*e.g.* families and retirees with 2 or 3 kW systems under secured loans with 8% interest and 10 year repayment periods). The results also confirm that three year repayment terms (as under unsecured microfinance) are unable to produce net cash flow positive outcomes for low income households. Ten year periods offer greater potential to yield financial benefits.

Daily energy consumption / load

The modelling suggests that in general, larger energy consuming households (15 kWh/day) are more likely to financially benefit than lower energy consuming households (particularly 5 kWh/day consumers), who receive only marginal potential benefits in a handful of baseline and decreased capital cost scenarios.

Capital cost sensitivity

Changing the capital costs exercises a moderate effect on net financial outcomes for households. Increasing or decreasing the capital cost by $500 affects the net monthly cost/benefit by -$6/+$2 under Darebin Solar $aver model, -$6/+$3 under Low Council Rate model, and -$7/+$6 under a Rates/Government Guarantee model. See Appendix B for detailed results under increased capital cost sensitivities and Appendix C for detailed results under decreased capital cost sensitivities.

Solar Rates Business Case Tool

This tool, developed as part of the project, allows local governments and Alliances to test program options in greater detail and estimate the net financial and environmental impacts on participating households. The user can enter details of possible program designs, including the number of participating households, interest rate, repayment period and intervals (e.g. quarterly repayments over 10 years), average tariff and unit costs of solar systems. The tool estimates the average financial, energy and greenhouse emissions benefits overall, and by household type, energy consumption profile (demand) and system size.

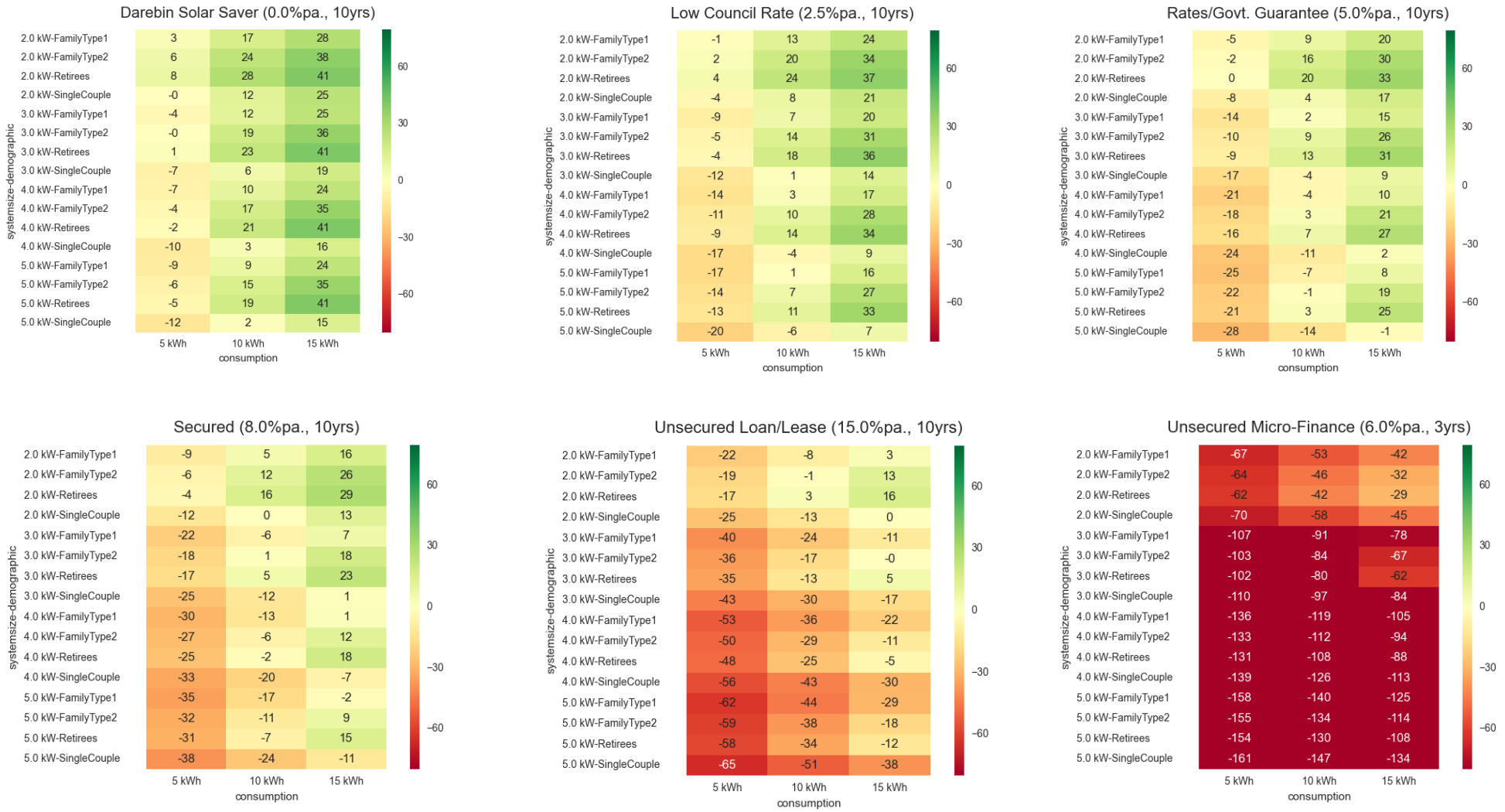

Figure 7: Net savings ($/month) under baseline scenarios

Summary

- Modelling indicates the council rates charges option is most able to optimise a myriad of market, technical and financial factors in order to deliver cash flow positive outcomes and confidence to lenders
- Private finance underwritten by Government default guarantee may be an alternative option, subject to the resolution of issues regarding security, management of default and the final interest rate charged to consumers
- The interest rate has the most material impact on the overall net benefit - far greater than other factors, such as material costs. An interest rate threshold of ~5% should be applied to allow net cash flow positive outcomes. This effectively precludes unsecured private loans and leases
- Shorter repayment terms (e.g. 3 years) are unable to deliver cash flow positive outcomes.

8 Efficient program design

To be viable, the model must involve a *simple and logical process* with minimum transactions, so that it offers an *accessible* and *trustworthy* option for householders and thus enable adequate participation levels. In addition, the model should be *scalable* to increase its reach and leverage economies of scale in procurement, administration and service delivery. Finally, the model should incorporate robust quality assurance and risk management mechanisms. These components will together ensure a resource efficient and manageable model for councils to opt into.

This chapter discusses ways the models can meet the needs of and enable participation by households and councils. Regional coordination, bulk procurement, partnerships with existing providers and shared services approaches are also assessed in terms of their ability to deliver a simple and logical process with minimum transactions, offer an accessible and trustworthy option for householders, and leverage economies of scale in procurement, administration, quality assurance and service delivery. Each are considered effective approaches and worthy of further investigation.

8.1 Requirements

Simple, logical, accessible and trustworthy for households

Finance arrangements can be complex and pose a barrier to household uptake. It can be hard to communicate arrangements to participants and ensure they understand and consent to it. Low income and disadvantaged residents may have low language or financial literacy and/or be wary of credit schemes. Any scheme needs to ensure that the process is clear, the requirements understood and the stakeholders are trusted. Householders will be more likely to participate if there is a streamlined process with one trusted point of contact and ideally one agreement.

Appropriate program scale

The program should have the ability to effectively replicate or scale across a region to meet the needs of low income households and leverage economies of scale. This means that the process, administration, procurement of equipment, suppliers and finance needs to be designed to be scalable.

Irrespective of the finance model, there will be decisions to make regarding the pilot and ultimate program scale and degree of program standardisation. It will be important to strike a balance between economies of scale, the capacity of parties (discussed below) and the ability to tailor to the needs of regions and market segments (particularly if future rollouts target other low income groups). As previously discussed, it will be important to start with pilots and scale up over time.

Quality assurance and risk management

Scheme credibility and risk management require the provision of adequate quality assurance mechanisms, for example the vetting of suppliers. Any program needs to maintain credibility and manage risks to ensure clear benefit to participants and comply with requirements of participating tiers of government. It is critical to ensure commercial partnerships are clear, transparent and accountable and the program maintains effective administrative and reporting functions.

8.2 Efficiency of the three program models

The council rates charges, private finance and state government loans mechanisms can each be assessed against the above requirements for efficient program design.

Council rates charges

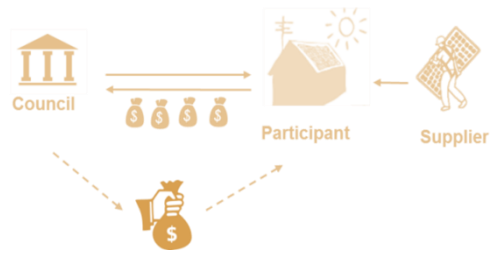

Figure 8

A council rates charges model (Figure 8) is relatively simple for householders to understand and engage with, since the rates mechanism is already understood and in use by participating households. The involvement of councils increases trust. The model is capable of providing a clear 'one stop shop'.

The model is potentially scalable subject to policy changes to the *Local Government Act 1989* (discussed in the 'Policy support' chapter). The Darebin Solar $avers scheme has established robust mechanisms for ensuring scheme credibility and risk management that could readily be adapted to individual council or regional/shared schemes.

Private finance

Figure 9

While private finance is familiar to and relatively simple for householders to understand, trust barriers may exist that would require working with other trusted stakeholders. It would be essential to ensure communications are clear and the process as streamlined as possible. Alternatively private finance initiatives such as No Interest Loans Schemes (NILS) (Case study 2) could be adapted to utilise transaction capability and support for participants.

The model is easily scalable, subject to the willingness of lenders to participate and the Victorian Government to entertain guaranteeing default (Figure 9). Work would be required to establish robust mechanisms for ensuring scheme credibility and risk management.

State government loans

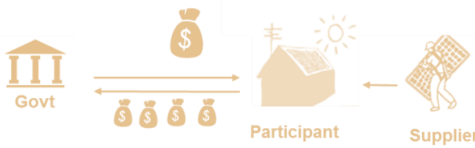

Figure 10

This model (Figure 10) enables wide access for participants and should be relatively simple for householders to understand and engage with, since an existing scheme is already in use and understood by households participating in that scheme. Councils, NGOs and suppliers may further support program promotion.

While the model is theoretically scalable, this is subject to the ability of the State Government to fund the complete program. Furthermore, it may require additional relationships with councils or banks to confirm credit risk and/or access security on asset. The amount of work required to establish robust mechanisms for ensuring scheme credibility and risk management would depend on the program complexity, procurement arrangements and partnerships.

8.3 Program elements

Regardless of the program model, a number of elements are required for successful implementation, including administration, promotion, procuring commercial suppliers and overall program coordination. While a council or Alliance can opt to manage all elements, those opting to leverage economies of scale by sharing and/or outsourcing their program delivery will at a minimum be required to manage certain administration requirements in-house.

Administration

Minimising the administrative burden of low income solar finance is a key consideration for councils when deciding whether to support or undertake such initiatives.

Where a council rates charge is used there are requirements to meet council approval processes and undertake rates recovery. It will be important to consider staff time required to:

- Establish a scheme under *Sec 163* of the *Local Government Act 1989*
- Issue and process regular rates repayment notices.

In addition, dedicated (or shared) council staff resources would be required for project management and minor administrational support. Darebin City Council have produced a customised “How to Guide” for councils which systematically lays out the steps and tasks required to implement a rates based scheme using the special charge mechanism. Table 6 below provides estimates of the likely resource implications of a council rates charges model at a number of program scales.

Private finance has existing administration mechanisms and represents a normal transaction for participating lenders, although they would need to ensure the transaction costs are contained within the 5% interest rate threshold for the term of any loan. For councils, private finance would be simple, although it would require support from existing staff resources and additional resources would be required for promotion and assessment. In addition, enacting default recovery may create complexity.

While a State Government loan model would be administratively simple for councils, this model is subject to the ability of the State Government to fund the complete program.

Promotion

Effective promotion of the program is critical to reaching those in need and achieving scale. It will be important to consider:

- Utilising existing and trusted channels to eligible households via council and NGOs
- Allocating sufficient resources to communicate complex information in clear and accessible formats
- Aggregation across multiple councils or regions to achieve efficiency.

To increase program attractiveness, marketing and promotion strategies should emphasise the product rather than the finance, and focus on the unique service proposition: this is a low-risk, cash flow positive and trustworthy way of lowering energy bills and improving home comfort. Defined eligible product/s should be offered that balance consumer choice with administrative complexity, and optional extras can be considered, such as household energy assessments and energy efficiency measures.

Commercial suppliers

Careful selection of a commercial supplier or suppliers is needed to access low cost, quality and service capability. It will be important to:

- Establish a clear procurement process to meet due diligence and comply with government procurement guidelines where appropriate
- During selection, equally consider supplier service capacity and quality along with product cost and quality

- Manage a supplier's inherent interest in achieving a sale to ensure households are screened to ensure cash flow positive benefit
- Leverage cost reductions from suppliers' capacity to reduce or remove promotion and coordination costs through bulk procurement
- Manage complexity to the household if the supplier selection is open.

Coordination/interface

There is an inherent need for coordination of multiple stakeholders and potential requirement to have a consistent interface with program participants. It is important to consider:

- Project management capability to coordinate across and between Government, councils and suppliers
- Customer service capability (staff and systems) to manage the process and provide a consistent interface for participants and stakeholders
- Avoid duplication or inefficient design whilst ensuring governance requirements for each stakeholder
- The capacity to recover these costs through integration in system cost or via grant funds.

8.4 Capturing economies of scale

Stakeholder consultation indicated councils can capture efficiencies in staff resources, reduce administrative burden and lower system costs through joint program implementation and/or bulk purchasing.

Regional coordination

To deliver a regional program inherently requires coordination across multiple councils to ensure clear information transfer and decision making functions to meet governance requirements. The existing Greenhouse Alliances along with the potential to establish a formal 'shared service' function provide appropriate structures to undertake this role.

Greenhouse Alliances	The regional greenhouse alliances have established capability in coordinating council participation in energy efficiency programs and policy development. Currently 70 out of 79 Victorian councils are members of an alliance. Each alliance has established governance structures with council representation and coordination facilitated by an executive officer. While most alliances are unincorporated (the exceptions are the Central Victorian Greenhouse Alliance and South East Councils Climate Change Alliance), a lead council or partner NGO may be utilised for administrative purposes or funds management and acquittal.
Shared service model	Shared services involve councils working together and/or with other organisations to deliver services to the community. Shared services can assist councils to operate more efficiently, improve quality of service delivery and ensure long-term sustainability. Local Government Victoria (LGV) provides a range of support services and guidance to the sector. Further development of a shared services model will be undertaken by EAGA/NAGA alliance in early 2016 with the support of DELWP funding.

Bulk purchase leverage

Consultation with service provides and previous experience with solar PV bulk purchase programs demonstrate that economies of scale can be captured in materials and installations costs. Where promotion, coordination and administration is organised separately, a solar provider is able to reduce costs due to avoided marketing and sales resource requirements.

Indicative scenarios

Table 6 illustrates the implications of scaling a council rates charges model in terms of likely staffing requirements (separated into administration versus other program elements), required leverage (the debt required to finance a program of equally mixed system sizes), solar PV system unit cost reductions and clean energy and environmental outcomes. The data is based on results from scenarios entered into the Solar Rates Business Case Tool, information from commercial solar PV providers, and staffing estimates based on the experience of the Darebin Solar $avers program (see Appendix E).

Each scenario assumes a fixed interest rate of 4%, quarterly repayments over 10 years, average electricity tariff of $300/MWh, average feed-in value of $60/MWh, baseline solar PV system unit costs of $3,350 for 2 kW, $4,850 for 3 kW, $6,000 for 4 kW and $6,950 for 5 kW and the maximum system unit cost reductions, Victorian grid emissions factor (scope 2 and 3) of 1.25 t CO_2-e/MWh and participation by a range of household types with varying average daily energy demand. Note the following are indicative results only based on the aforementioned assumptions, and should therefore not be used as the sole basis for the design or business case of a low income solar finance program.

In short, the indicative scenarios show how administration costs to individual councils remain relatively fixed regardless of program scale but are contained. Where scaling and regional collaboration can leverage efficiencies and economies of scale is in program resourcing and system costs.

Table 6: Indicative resource requirements and outcomes for a council rates charges model across a range of program scales (4% interest, 10 years repayment, multiple household types)

Number of councils	Number of households	Council admin requirement	Program requirement[1]	Required leverage	Reduction in system unit cost[2]	Clean energy generated	Greenhouse gas abatement
1	300	0.65 FTE/Council	3 FTE	$1.54 million	1.5 to 3%	1,157 MWh	1,446 t CO_2-e
2	600	0.65 FTE/Council	3 FTE	$2.99 million	3.5 to 5.9%	2,892 MWh	2,313 t CO_2-e
1 Alliance. (7 councils)	2,100	0.5 FTE/Council	4 FTE	$10.06 million	6 to 9.4%	8,096 MWh	10,120 t CO_2-e
2 Alliances (15 councils)	4,500	0.5 FTE/Council	5 FTE	$20.87 million	9.6 to 12.3%	17,349 MWh	21,686 t CO_2-e

[1] Can be delivered by councils, shared services and/or regional collaboration. [2] Compared to the cost of a single solar PV system.

8.5 Partnerships

As previously outlined, it will be important to utilise partnerships to build trust with participants and stakeholders and integrated with broader capability and complementary services.

Sustainability Victoria

Sustainability Victoria (SV) is a statutory authority and a key delivery agency for the Victorian Government. SV delivers the Victorian Government's sustainability programs to Victorian households and is a trusted source of independent information on energy efficiency for the Victorian community.

SV works with other government portfolio interests such as the Department of Health and Human Services (DHHS), Department of Premier and Cabinet (DPC), DELWP and Department of Economic Development, Jobs, Transport and Resources (DEDJTR) and can provide a conduit into the Victorian Government more broadly so the program/project outcomes and lessons can be shared across government.

SV has a regional Victorian presence with offices in Gippsland, the North East, Loddon Mallee, Grampians, Barwon South West, as well as in metropolitan Melbourne. These offices provide a link through to local government in these regions and help to support the rollout of the SV programs. These resources, combined with the centralised Households Team at SV, could build upon the involvement of the Greenhouse Alliances in these areas and help support a rollout of a low income solar finance program with local government.

Initial discussions with SV indicate an interest in examining the opportunities for additional household interventions and alignment with complementary mechanisms such as VEET. SV is in parallel considering how it can better align program delivery in partnership with local government.

NGOs

Social sector NGOs provide related energy efficiency and finance services to low income households in Victoria. Kildonan UnitingCare provides respected programs to support households to manage energy costs and avoid disconnection through energy efficiency assessments and financial counselling. Good Shepherd has a long history in providing NILS loans, recently expanded under the banner of Good Money to open retail shop fronts to allow participants to access information, advice and support in loan arrangements.

MEFL's social enterprise Positive Charge provided a project management, coordination and interface to support the delivery of the Darebin Solar $aver program. Positive Charge has 14 council partners in Victoria and undertakes supplier procurement of behalf of councils for bulk solar programs. The initiative operates a customer service centre providing advice, supplier referrals and links to complementary programs. Other NGOs such as the Yarra Energy Foundation and Goulburn Valley Community Energy have demonstrated interest and capacity to deliver community bulk buy schemes and low income support programs. NGOs can be considered as part of a shared service arrangement to support the delivery of a regional program.

Social housing

There are a number of opportunities to work with social housing providers (both government and NGO) to implement a rollout. Several community housing providers are trialling finance approaches and demonstrate a strong interest and capacity to deliver benefit to low income households. SGCH (formerly St George Community Housing) in NSW recently received funding from the Clean Energy Finance Corporation (CEFC) to support construction of energy efficient new buildings and the retrofitting of existing stock. Community Equity Housing Ltd in Victoria is currently partnering in a hot water replacement program pilot.

Case studies 4 and 5 illustrate the different partnerships and arrangements can be used to deliver large scale solar finance programs internationally, in the United States and New Zealand respectively.

Case study 4: Property-Assessed Clean Energy (PACE)

The Property-Assessed Clean Energy (PACE) program has facilitated $626 million in private finance to 31,300 homes to date for energy efficiency, water efficiency and renewable energy projects (particularly solar PV and HVAC upgrades) across California and other states in the US. The program has expanded from a Berkeley city program to include hundreds of local governments. PACE delivers finance administered through private organisations on behalf of local governments. Homeowners enter into an agreement with an administering organisation, which secures private finance and provides funds to pay suppliers. The debt is paid back through additional property taxes, and can be passed on to subsequent owners if a home is sold. Local governments then repay the recovered debt to administering organisations.

Owner-occupiers (particularly renovators) are the primary target market. Existing legislation allows for property taxes to be used as the finance mechanism, and legislative changes have been secured to assist a wider rollout and address some of the complexities surrounding multi-unit dwellings.

Advantages include using suppliers to promote the program during existing interactions with customers. Disadvantages include the Federal Housing Finance Authority's refusal to buy mortgages with a PACE agreement. Ease of access and an intuitive web interface were influential in households' decisions to participate, while interest rates were not significant factors.

Key roles and responsibilities

Administering organisation	- Purchases finance as asset-based securities on the private market - Recruits, accredits and liaises with suppliers - Enters into agreement with homeowner and provides funds to pay suppliers - Undertakes quality assurance - Collects payments from local governments when paid by homeowners through property taxes.
Suppliers (primary drivers)	- Market finance to homeowners when quoting for services - Quote for, supply and install energy efficiency, water efficiency or renewable energy products - Sign Completion Certificate at completion of services.
Local governments	- Enter into a contract with administering organisation - Collect debt repayments from homeowners through additional property taxes - Repay debt to administering organisation once collected.

More information: www.pacenow.org and energy.gov/eere/slsc/property-assessed-clean-energy-programs

Case study 5: Voluntary Targeted Rates (VTR)

The Voluntary Targeted Rates (VTR) program is administered by local governments in New Zealand (NZ), with support from the Energy Efficiency and Conservation Authority (EECA). Rate-paying homeowners can enter into a voluntary agreement with councils to finance clean energy retrofits (principally insulation), which can include renewable energy, energy efficiency and water efficiency measures. The debt is paid back through an additional rates charge over a nine to ten year period, through an existing legal mechanism. The additional rates mechanism is intended to be cost-neutral to local governments, with the interest rate applied covering the councils' administrative costs for the program. However rates vary: for example, the rate in Wellington is 7%, in some councils it is 0%.

The program was initially delivered to support low income households with the upfront cost associated with accessing a federal government insulation grant. The target market now includes a broader range of homeowners. According to the EECA, over 24,000 households have participated in the program (as of April 2015) across nine councils servicing around 60% of NZ's population.

Advantages include combining the program with other incentives (*e.g.* the initial insulation grant); EECA audits and other support to reduce council risks; and environmental and resilience co-benefits (*e.g.* reducing the need for water network expansion through water tank installation in remote areas). Disadvantages include getting the council finance team on board, since it creates additional work; communication around passing the debt to a new owner; and delaying councils' rate income.

Key roles and responsibilities

Local governments	- Administer the program - Enter into agreement with homeowner - Provide finance, either from council reserves or by taking out a loan - Select and evaluate suppliers and products (where products and services offered differ from standard EECA program) - Pay suppliers and undertake quality assurance. - Collect debt repayments through additional rates charges.
Suppliers	- Primary promoters of the scheme - Quote for, supply and install clean energy products - Lodge relevant forms with local government and EECA.
Energy Efficiency & Conservation Authority (EECA)	- Available to provide support to local governments set up a VTR scheme - Promotes VTR to local governments who have not adopted the program - Reports to local governments on number of VTR claims processed - Audits 5% of installations for quality assurance - Assists local government to evaluate suppliers and products where these align with broader programs.

Summary

- The program must be a simple, logical and attractive for households to participate
- A program needs to actively manage scale, quality and efficiency to achieve impact and manage risk for councils and other stakeholders
- Regional coordination or a shared services model is an effective way of managing requirements such as governance and administration
- Partnerships are critical; there is no one organisation able to deliver all aspects of low income solar finance
- Accessing quality market finance and equipment installers requires a clear procurement process.

9 Policy support

To be implemented in a timely manner, the model must be viable under current legislative, funding and regulatory settings. Through successful practical demonstration, a regional solar finance program can strengthen the case for program expansion, policy improvements and the exploration of other potential models.

This chapter considers the current robustness of each finance model under existing legislative, funding and policy settings. The council rates charges model and to a lesser extent the private finance model are considered the most viable in this respect. In addition, the chapter identifies opportunities for policy improvements that can support program expansion and the exploration of other models.

9.1 Renewable Energy Roadmap and Action Plan

The Renewable Energy Roadmap sets out the Victorian Government's plan to accelerate the development of renewable energy projects by 2020. The Roadmap identifies the following four priority areas:

- Establishing a renewable energy target of at least 20% by 2020
- Using the Government’s electricity purchasing power to support the creation of hundreds of renewable energy jobs
- Ending unfair discrimination and improving access to the grid for solar customers
- Supporting clean energy jobs through the $20 million New Energy Jobs Fund

The Government will also source renewable energy certificates from new projects in Victoria, bringing forward around $200 million of new investment in at least 100 megawatts of renewable projects.

Following recent public consultation on the Roadmap, the Government is currently developing a *Victorian Renewable Energy Action Plan*, which will set long-term actions to drive investment.

New Energy Jobs Fund

The $20 million fund provides an important potential vehicle for deploying a regional solar finance program. The funding round opened in late 2015 and submissions due in mid-March, with opportunity for engagement with the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) through a formal consultation process. The Fund could potentially support development of any of the three models.

9.2 Climate Change Framework

The DELWP is currently undertaking community consultation to inform its Climate Change Framework, which will be released in 2016. The Framework aims to position Victoria as a leader in climate change action, and sets out seven priorities:

- Driving emissions reduction
- Addressing vulnerability and building resilience
- Innovation, jobs and skills for the future
- Enabling action and ownership in community and business
- Climate ready infrastructure
- Victorian Government leading by example
- Science, research and capability

Prioritisation of emissions reductions and building resilience in vulnerable individuals and communities suggests that policies and measures developed under the framework may present an opportunity to further support or expand a low income solar finance scheme.

9.3 Local Government Act review

The *Local Government Act 1989* review will look at the objectives, roles and functions of Councils; the powers required of Councils to achieve these objectives and perform their roles and functions; and the extent these should be regulated under *the Act*. It will consider all legislation for which the Minister for Local Government is responsible and integrate this into a new Act. Following consultation this year around issues related to the current Act, 2016 will see consultation on reform directions followed by consultation on proposed new legislation in 2017.

Special Charges

The Darebin Solar $aver program pioneered the use of the existing *Special Charges Scheme (Sec 163)* of the *Local Government Act 1989* to apply a charge for 292 pensioner households to repay a solar system (see Case Study 1). Section 163 was originally designed to allow Councils to pass on the cost of constructing sealed roads, kerbs and channels, footpaths, underground drainage and other capital infrastructure to the owner of a property that generally receives a unique benefit from the construction works.

Although a precedent for the use of Section 163 for solar PV has been set and it is possible to use the council rates charges model now, many Councils have been reluctant to make use of this option because of legal uncertainties and concerns. Furthermore, if Councils access finance to support a residential rates based program it remains a liability on their balance sheet. The review has the potential to amend the Act to both streamline the application of rates charges (to obviate the current two month approval period) and enable finance to remain 'off balance sheet' (similar to commercial EUAs, see below), avoiding the balance sheet accumulation of debt, and thus providing greater confidence to councils when deciding whether to opt in to a future program rollout across Victoria. Initial discussions indicate the Victorian Government is open to considering legislative reform.

Environmental Upgrade Agreements (EUAs)

The Victorian Government in September 2015 proclaimed the *Local Government Legislation Amendment (Environmental Upgrade Agreements) Act 2015*. This means that all local governments in Victoria are now able to voluntarily offer their constituents EUAs for commercial and industrial renewable energy and energy efficiency projects. EUAs allow for tenants and building owners to collaborate on energy, water and waste projects. Unlike other alternative finance options, EUAs allow tenants to contribute financially to the project where it makes sense to do so and help shape the project to best suit their needs. EUA finance also offers 100% project finance, very competitive interest rates and long term finance; resulting in no cash flow impact on the projects. Importantly, it allows Councils to keep this finance 'off the balance sheet'.

9.4 Government loans schemes

As noted in the 'Low interest and low risk' chapter, while examples of State Government loans schemes exist they are relatively small, with approximately 50 successful loan applications per year and a few hundred active loans currently under the Home Renovation Scheme (see Case Study 3). There is currently uncertainty on whether the present scheme will continue under government policy and what appetite might exist for establishing a new scalable scheme.

9.5 Other policy influences

Rates capping

The *Local Government Rates Capping & Variation Framework Review* by the Essential Services Commission (ESC) is nearing completion. Victorian local government has unanimously opposed the rates capping policy, which proposes Councils should apply to the ESC if they want to raise rates

above the Consumer Price Index (CPI). Whilst this policy does not restrict councils' access to finance or the use of their rates mechanism, the restriction to their general income may result in an atmosphere of caution and review of the priority of and funding allocation among their programs. Given this, it will be important for local government to incorporate a narrative around how low income solar finance can improve the ability of households to pay their rates.

Focus on low income households

Among other things, the *Saving Energy, Growing Jobs: Victoria's Energy Efficiency and Productivity Statement*, released by the Minister for Energy and Resources, the Hon Lily D'Ambrosio in June 2015, flagged support for low income households vulnerable to energy costs. The Government has also committed to initiatives such as the expansion of the NILS to cover energy efficiency products with higher upfront costs, and public and social housing programs. This suggests the Government should be receptive to efforts to ensure policy settings are conducive to low income solar finance.

Summary

- Policy developments indicate the Victorian Government is interested in supporting the scaling of low income solar finance
- The New Energy Jobs Fund provides an important potential vehicle for trialling a regional solar finance program
- Policies and measures developed under the Climate Change Framework may present an opportunity to further support or expand a low income solar finance scheme.
- The *Local Government Act 1989* review has the potential to both streamline the application of rates charges (to obviate the current two month approval period) and enable finance to remain 'off the balance sheet' for Councils and hence allow greater participation in a regional solar finance program.

10 Conclusion and recommendations

As discussed in the Introduction, to have a strong business case for a regional solar finance program, the model must demonstrate its viability against four key criteria: benefit to low income households, low financial risk, efficient implementation and immediate feasibility. The earlier chapters of this report have provided detailed assessment of potential models, markets and delivery approaches against each of these criteria based on a combination of financial, demographic and technical modelling, stakeholder interviews, case studies and review of key policies and reports.

An evaluation of the three program model options - Council rates charges, private finance and Government loans - against the four criteria is summarised in Table 7. A more detailed summary is also provided in Appendix D. In short, a regional solar Council rates program that targets rates paying pensioners has the ability to efficiently and immediately deliver benefits to large numbers of low income households at low risk to all parties. Opportunity is also identified to trial a private finance model, subject to the private lenders' capacity to forgo profit and the Victorian Government's ability to underwrite the risk of default. The viability of a Government loans model is less certain and would rely on the Victorian Government's ability to fund a state-wide program.

Table 7: Summary of the viability of the three solar finance models

	Council rates program	Private finance with government guarantee	State government loan
Benefit to low income households	✓	?	✓
Low interest and low risk	✓	?	✓
Efficient program design	✓	✓	✗
Policy support	✓	?	?
Overall program model viability	✓	?	?

Based on the analysis presented in this report, the following recommendations are made.

Recommendation 1. Fast track a regional council rates charges program under existing legislation

A regional council rates charges program targeting rates paying pensioners is recommended as the most pragmatic way for local government to rapidly and reliably demonstrate the scalability of low income solar finance in Victoria. Detailed technical, financial, policy and market analysis undertaken in this project confirm the ability of this model to generate net cash flow positive outcomes for an identifiable group with sufficient scale to make a regional scheme viable for council participation under existing policy. Furthermore, this approach can leverage the successful Darebin Solar $avers program (now in its second phase) and lay the necessary groundwork for future expansion of solar finance to other low income groups facing particular barriers and across Victoria.

Recommendation 2. Adopt a shared services approach

A coordinated program or shared services approach is recommended as the most practical delivery method to access dedicated capability and reduce resources required from and risks to councils. Doing so would leverage economies of scale in administration, procurement and governance, and (importantly) enable participation by councils not otherwise able to offer this service to their residents. A shared services approach is also more likely to be conducive to rapid program expansion in future phases. Delivery arrangements for a shared service approach will need to be addressed through

further work, but Alliances are encouraged to identify existing bodies with experience in low income solar finance to fast track delivery (*e.g.* Good Shepherd Microfinance, Positive Charge).

Recommendation 3. Advocate for changes to the *Local Government Act 1989*

It is recommended that EAGA and its partner Greenhouse Alliances work with Victorian Local Government Association (VLGA) to advocate to the Victorian Government to progress legislative change to streamline rates charges under Section 163 of the *Local Government Act 1989* and enable 'off balance sheet' finance similar to the recent Environmental Upgrade Agreement (EUA) legislation.

Recommendation 4. Explore a private sector pilot

The private finance with government guarantee model assessed in this report should also be considered, although it is noted that the mechanism for its future scaling remains uncertain due to issues around managing default. The willingness of both financiers and Government to support this model will be crucial to its success. Further analysis is required to define the risk profile of each low income household segment to establish the size and scope of the default fund. Assuming the Government entertains guaranteeing default and a bank is willing to commit to a viable interest rate, a pilot could be undertaken to ascertain the model's ability to engage at a meaningful scale with low income households.

Recommendation 5. Pursue Victorian Government funding

It is recommended that the Alliances engage the Victorian Government regarding funding support to develop and pilot the regional council rates charges program, principally through the New Energy Jobs Fund. The application should seek the endorsement of local government and finance providers in the concept and identify a select group of local governments to be supported to pilot the program. The Victorian Property Fund should also be considered an opportunity for Alliances to progress.

Recommendation 6. Advocate for Victorian Government policy development

EAGA, along with other voices, should seek to progress dialogue with the Victorian Government to develop a state-wide program to support low income households to access the benefits of solar PV. Assuming the New Energy Jobs Fund application for the proposed regional council rates charges program is successful, this will demonstrate practical Victorian Government support of the first stage of scaling up low income solar finance. This support, together with improvements to legislative and regulatory settings, will provide a strong foundation for a local-State government partnership to attain the Alliance's ultimate goal of state-wide delivery of solar finance to low income households. The development of the Renewable Energy Road Map also provides opportunities to engage with the Victorian Government to integrate low income solar finance objectives, demonstrate the potential and resolve the most appropriate amendments.

Recommendation 7. Victorian Government partnership to develop programs

In addition to working with the Victorian Government regarding funding and broader policy support, the Alliances should seek to establish a local-State government partnership to develop the pilot regional council rates charges program and establish greater capacity to deliver complementary sustainable energy and energy efficiency services to households. A partnership approach would best utilise the demonstrated experience and capabilities of agencies such as Sustainability Victoria in delivering sustainability programs and independent energy efficiency information to Victorian households. It would also help to ensure effective coordination and collaboration by a range of government portfolio interests, local government, social and environmental NGOs, and social housing providers, all of whom share a common interest in advancing sustainable energy outcomes for low income households in Victoria.

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Appendix A: Modelling assumptions

Solar insolation for a Melbourne metropolitan location.

Solar PV systems priced as follows:

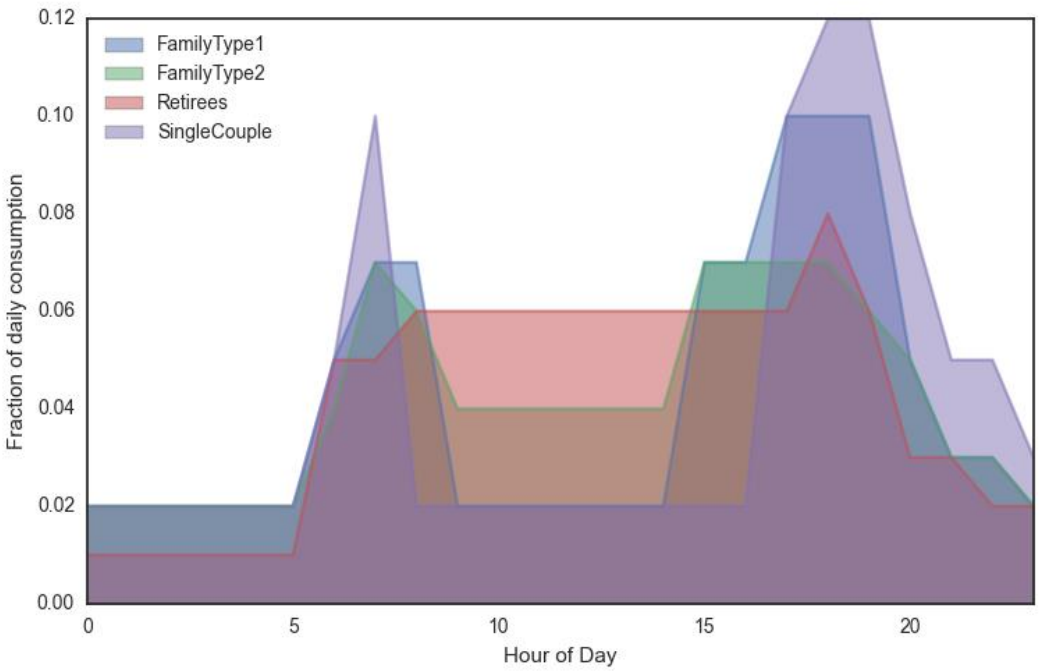
- 2.0 kW at $3,350
- 3.0 kW at $4,850
- 4.0 kW at $6,000
- 5.0 kW at $6,950

Electricity costs calculated as follows:

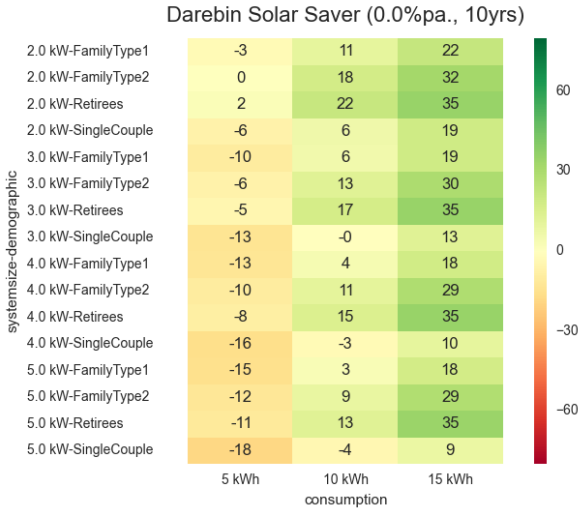
- Without solar at 30c/kWh
- With solar at 35c/kWh peak, 13c/kWh off-peak and a 6c/kWh feed-in tariff

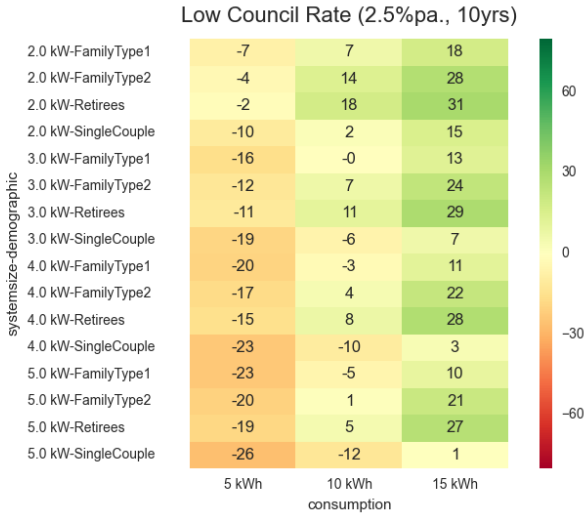
Daily consumption assumed to vary by demographic group according to profiles shown in chart below.

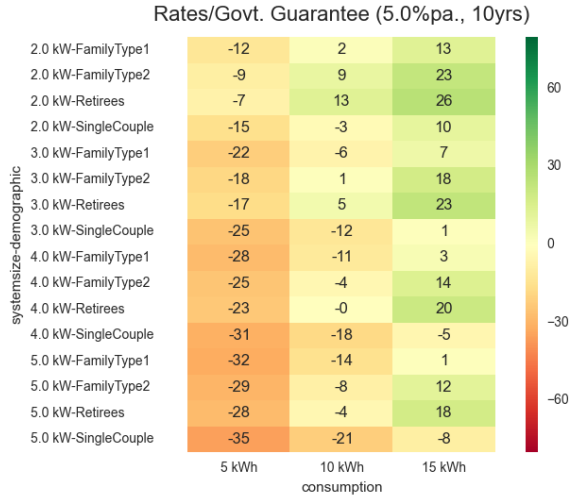
- Family Type 1 Couple with children, both parents working
- Family Type 2 Couple with children, 1 parent staying home to look after kids
- Retirees 1-2 people living in the home, generally at home during day
- Single/couple 1-2 people living in the home, all occupants working 9-5 Monday to Friday

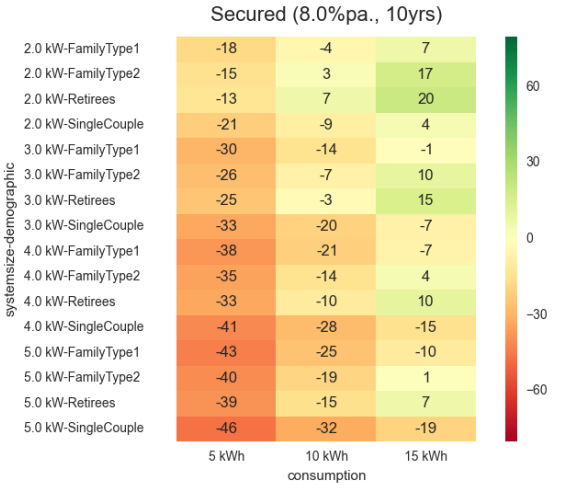


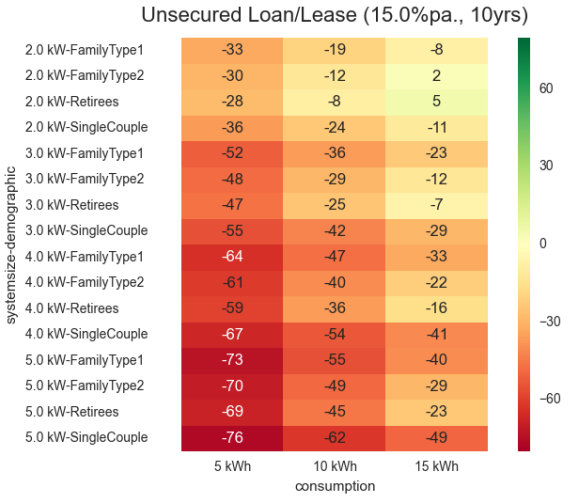
Appendix B: Net savings ($/month) with $500 higher capital cost

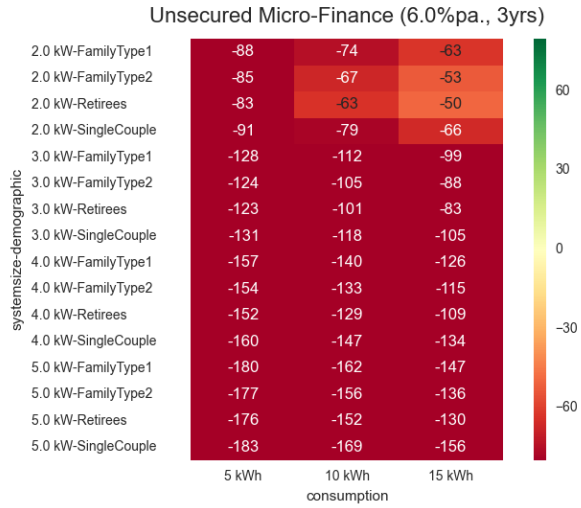




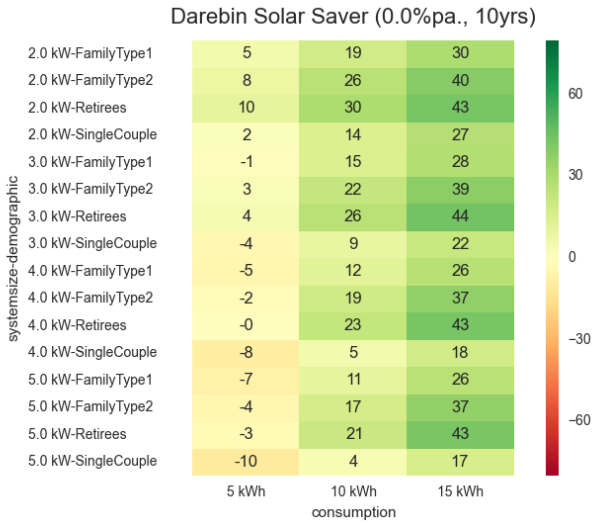


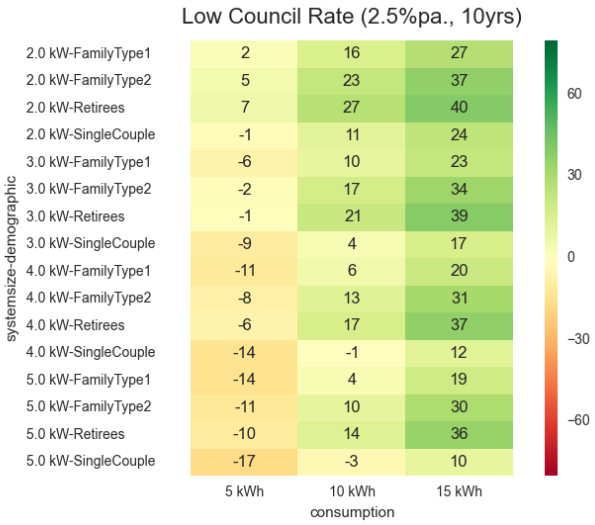


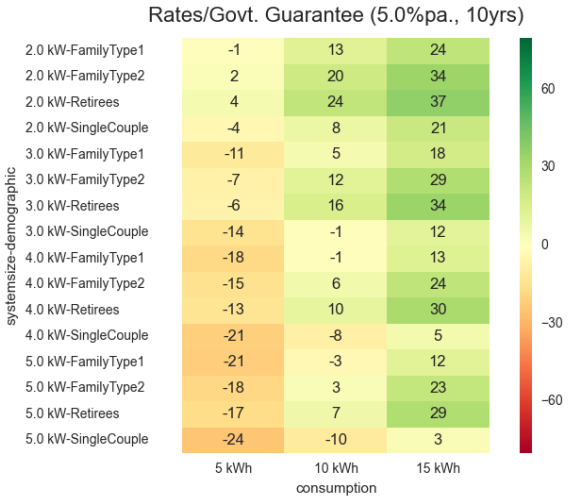


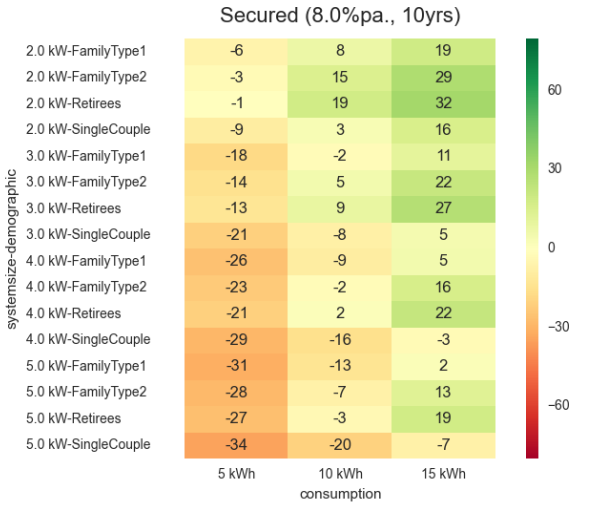


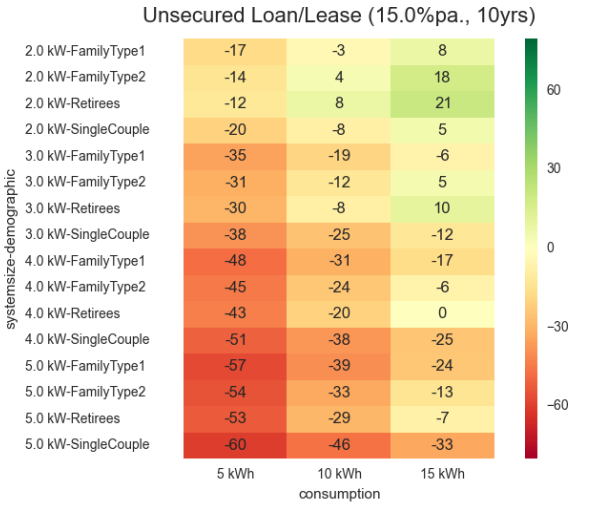
Appendix C: Net savings ($/month) with $500 lower capital cost

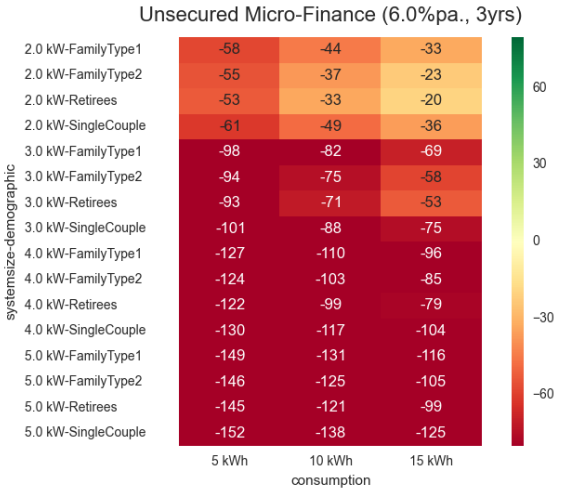












Appendix D: Summary of viability of solar finance models

	Council rates charges program		Private finance program		State Government loan	
Benefit to low income households	> Clear access for owner occupiers (1 in 2 low income households) > May limit renters unless landlords are eligible > Low interest increases benefit to household > Limited to participating Councils > May be integrated with other services and link to other measures, e.g. energy efficiency > Potential to expand to all households to deliver climate policy targets > High expectation of participation where Council is active; excludes those not in active Council areas	✓	> Wide access for participants, though renters create complexity > Effective participation needs to be proven > Interest rate may narrow benefit to only a few households > No capacity to expand beyond low income participants > Ability to link other measures though limited business case > Low expectation of overall participation > Will require complementary promotions/recruitment strategy	?	> Wide access for participants though renters create complexity > Effective participation needs to be proven > Low interest increases benefit to household > May be integrated with other services > No capacity to expand beyond low income participants > Ability to link other measures/services, such as energy efficiency > Low expectation of participation due to limited on-ground capacity > Will require complementary promotions/recruitment strategy	✓
Low interest and low risk	> Limited financial risk due to rates certainty > Requires Council to administer long term > Requires Council to provide or secure upfront capital subject to rates legislation	✓	> Subject to bank ability to provide and maintain maximum 5% fixed rate and Government providing sufficient underwriting of default > Additional program costs not easily recovered > Government procurement processes may prevent securing effective bank partnership arrangements	?	> Government is unwilling or unable to effectively resource a statewide program > Centralisation of the program may limit effective design and support for on-ground delivery > Government procurement requirements may complicate supplier engagement	✓
Efficient program design	> Program costs can be recovered through rates charge > Requires Council to provide or secure upfront capital subject to rates legislation > Required dedicated (or shared) council staff resources for project management and minor administrational support > Capacity for Council/shared service to provide clear 'one stop shop' > More complex if supplier selection open	✓	> Transaction covered within rate > Additional resources required for promotion/assessment > Requires support from existing Council staff resources > Complex for household if supplier selection open > Normal transaction for bank > Simple for Councils > Enacting default recovery may create complexity	✓	> State Government required to fund complete program > Councils/NGO/suppliers may support promotion > May require additional relationships with Council or banks to confirm credit risk and/or access security on asset > Complex for household if supplier selection open > Wide access for participants > Simple for Councils	✗
Policy support	> Possible now; changes to the *Local Government Act* will enable full potential of model > Sufficient Councils need to participate to deliver benefit	✓	> Government funds need to be secured > Bank needs to operate at or below 5% interest rate	?	> Government needs to commit to complete program	?
Overall program model viability	> Limited geography/ high uptake/ clear benefit	✓	> Simple/ universal/ low uptake/ constrained benefit	?	> Universal / low uptake/ clear benefit	?

Appendix E: Darebin Solar $aver task times

		Activity	One-off task	No of staff	Repetitive Task	Task Time	Total	Sub Total
12 - 16 wks		**Research in preparation for Survey**						
		Background Research -behaviour change	12				12	
		Background Research -CSIRO study	12				12	24 hrs
		Prepare Council Qtrly survey						
		Prepare 200 x Council survey & Focus Groups	24				24	
		Focus Groups		2	3	2.00	12	
		Write up Focus Groups		1	3	2.00	6	
		Prepare x 200 household General Council Quarterly survey	4				4	
		Analyse x 200 household General Council Quarterly survey	4				4	50 hrs
		Pensioner Survey						
		Prepare survey for 3,000 pensioners	16				16	
		Approval, printing of letters and survey forms	8				8	
		Set up database for mail merge labels	3				3	
		Mail merge labels and print labels	2				2	
		Place in envelope to post - casual staff		1	3000	0.01	30	
		Coding Survey Response - Casual Staff	20				20	79 hrs
	13 - 16 wks	**Recruitment**						
		Record names & addresses of 220 - survey response		1	200	0.20	40	
		Record names & addresses of 60 - ph call response		1	60	0.25	15	
		Record names & addresses of 50 - email response		1	50	0.20	10	65 hrs
		Follow up recruiting - 4,000 additional letters direct mail						
		Prepare letter for sending	3				3	
		Mail merge letter	2				2	
		Print mail merge letter 4 x 1,000	8				8	
		Fold letter into clear envelope and post - casual staff		1	4000	0.02	80	
		Phone calls - explaining solar, elect charges, smart meters & offer		1	150	0.20	30	
		emails - explaining solar, elect charges, smart meters & offer		1	150	0.20	30	
		CALD - Interpreter Service phone calls		1	20	0.50	10	
		Recruiting Project administration -						
		Casual - inquiries, follow up, preparing database (Mara +)	201				201	
		Heritage Permit Appl - review, title search, application + drawings	24				24	388 hrs
7 - 8 wks		**Contract Administration**						
		Prepare Tender documents	16				16	
		Procurement Panel, lodge Tender docs, advertisement - 4 wks	10				10	
		Tender Evaluation		5	1	5.00	25	
		Interviews - pre and post interview questions		5	1	5.00	25	
		Finalise Tender recommendations and report	8				8	
	13 - 16 wks	Council Procurement report	8				8	
		Problem solving contractual information ,	16				16	
		Installation - 200 in 4 wks, 13 wks 95%, 4 months in total						
		Weekly contract meetings - Positive Charge		2	16	1.00	32	
		Weekly contract meetings - Energy Matters		2	13	1.00	26	
		Payments and Variations to contract	16				16	182 hrs
7 - 9 wks		**Special Rates Charges Scheme - formal mechanism**						
		Check pensioner eligible for participation		1	300	0.10	30	
		Prepare Council Report - propose SRCS for Solar	16				16	
		Finalise List of Participating households - Appendix	16				16	
		Prepare letter of explanation SRCS + Appendix list	4				4	
		Print letter & mail merge to pensioners	8				8	
		Place in envelope to post - casual staff		1	300	0.02	6	
		Handle inquiries		1	20	0.20	4	
	2 wks	Prepare final SRCS Council Report	8				8	
		Sign individual contracts		1	294	0.05	14.7	
		Electronic filing of signed individual contracts		1	294	0.20	58.8	166 hrs
		Information Seminar - 2 x 1.5 hrs sessions						
1-3wks		Prepare letter about info sessions, meters, charges etc	6				6	
		Letter to 300 Pensioners		1	300	0.02	6	
		Prepare seminar - staff	18				18	
		Prepare presentations	6				6	
		Seminar - 4 Council staff - set up and clean up		4	2	2.00	16	
	8 wk	Phone calls - elect retailer approval & smart meters reprograming		1	200	0.25	50	
		Follow up with Cert. of Inspections/Smart Meter programming		1	60	0.30	18	120 hrs
26 weeks		**Communications & Awards**						
		Prepare Press Release info for each stage		1	5	2.00	10	
		Photos of installations	12				12	
		Video permission and recording		1	2	3.00	6	
		Award applications		1	3	8.00	24	
		Presentations to Councils/Seminars		1	5	4.00	20	
		Extended Phone conversations with State Govt/Alliances/industry		1	20	0.70	14	
		Taking calls and Registering Interest for next program		1	120	0.20	24	110 hrs
		Totals					1183.5	**1184 hrs**
		Basic - no research no awards	**0.53 EFT**	**960 hrs**	**Darebin Council**		**0.65 EFT**	**31.1 wks**