Final Report Prepared by

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Frankston City Council
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Mahogany Neighbourhood Centre Inc.
26 Mahogany Avenue, Frankston North
Ph: 9786 1445, Monday to Thursday, 9am - 4.30pm
and Friday 9am - 2.30pm
mahogany.org.au
- Art and craft
- Playgroups
- Children’s and family activities
- Community activities and events
- Computers and internet
- Health and wellbeing
- Music and dance
- Recreation
- Senior citizens
- Skills development
- Support
- Venue hire
- Youth activities for 12-15 year olds

Frankston North Community Centre
(Previously known as Mahogany Neighbourhood Centre Inc.)
26 Mahogany Avenue, Frankston North
Ph: 1300 322 322, Monday to Friday
E: frankstonnorthcommunitycentre@frankston.vic.gov.au
Council will resume management of Mahogany Neighbourhood Centre on 30 January 2015.
Come along and chat to the new manager about programs, activities and projects in which you can participate or volunteer to support your local community to learn and grow.

Some of the health and wellbeing groups include:
- Health programs
- Education, training and employment programs
- Tai chi
- Exercise
- Children’s programs and activities
- Women’s support groups
- Agestrong
- Social groups for seniors

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EXECUTIVE SUMMARY

Frankston North Community Centre (formerly Mahogany Neighbourhood Centre) is in the low socio-economic community of Frankston North. The centre provides important community support services and a safe, nurturing place to meet. The centre has been plagued by high bills for a number of years, with a 30+ year old Heating Cooling and Ventilation (HVAC) system, inefficient lighting, single glazing and poor passive solar orientation.

The Community Energy Efficiency Program assisted with a contribution of $177,566 to retrofit the building and replace the HVAC system to reduce energy consumption and costs, maintenance costs, greenhouse gas emissions and provide avenues for capacity building amongst the community to reduce their energy usage. Frankston City Council contributed the remaining funds, bringing the project total to $272,506.

The actual electricity savings achieved as a result of the project to date, determined from annualised data, is $2,742 in electricity costs per year, equating to a 12,555 kWh reduction. In addition, the post implementation audit determined that operational costs could be reduced by as much as $26,000 per year in HVAC maintenance (based on 2012/13 maintenance costs). The project has therefore resulted in a 24% reduction in energy usage, with a simple payback of 10.5 years.

Reducing the operational cost of the centre has an additional community benefit, as money saved can be put in to community programs rather than utility and maintenance bills. In addition, the project has resulted in increased comfort levels for user groups, particularly the elderly, and increased community knowledge and confidence in understanding electricity saving at home. Capacity building in the energy efficiency industry has been gained through working through challenges with push button controls on heating and cooling systems, and lighting selection.

Overall, the project has been successful in engaging the local community on energy efficiency, with around 400 community members involved, however, the original projected energy savings have not been achieved to date. This is mainly due to changes in the operational hours and occupancy of the facility, expansion in floor area of 95m², as well as the savings in the original audit potentially being overstated. Council is currently investigating Energy Performance Contracts in the future for all its facilities, to ensure that future energy audit savings are guaranteed and are therefore realised.
INTRODUCTION

Frankston North Community Centre (formerly Mahogany Neighbourhood Centre) in Frankston North provides a range of social, educational and recreational programs in response to the changing needs of the Frankston North community.

Management of the centre was taken over by Frankston City Council in January 2015.

The centre offers a welcoming supportive environment, friendly, understanding and caring staff, opportunities to develop existing skills or learn new skills, volunteer participation and a meeting place for the community.

The centre works with the local community to increase community participation and social inclusion, in the low socio-economic community of Frankston North.

High electricity bills and an unreliable HVAC (Heating, Ventilation and Air Conditioning) system have plagued the centre for many years. This has been impacting on its ability to deliver essential services to the community.

The centre now operates Monday to Friday 9am to 5pm (previously Monday to Thursday 10am-4pm and Friday 10am-2.30pm). The centre is also used by various groups outside regular operating hours.

Groups and activities conducted on site include art and craft, children’s and family activities, community activities and events, music, health and wellbeing course, senior citizens clubs and youth activities.

Scope of Work

Key activities undertaken under this project were to:

- Replace the existing 30+yo HVAC system
- Remove user access to HVAC controls and install a push button operation with fixed temperature limiters
- Removing radiators and other energy intensive forms of heating
- Decommission existing electrical hot water system and replace with a solar hot water system (HWS)
- Replace inefficient lights with LED lighting

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- Improve thermal performance through insulation; window treatments or shading; installation of fans; draft sealing
- Develop a Building User Guide for staff and user groups
- Run energy efficiency workshops for staff, user groups and the broader community

PROJECT OBJECTIVES

The energy efficiency objectives for this project were:

- Reduce energy efficiency from a revised baseline of 159.8 MJ/m² to 50.12 MJ/m² (including solar PV). This was later revised as the PV system was outside the scope of the grant.
- Reduce electricity costs by $10,990 ex GST per year (See Attachment B at end of document)

The actual energy savings for the project are:

Baseline annual energy usage = 191,803 MJ (actual, revised)
Annualised energy usage after implementation = 146,603 MJ (40,723 kWh/year)
Annualised energy savings = 45,200 MJ (or 24% reduction)

The initial energy audit indicated that the proposed energy efficiency measures would result in electricity savings of 35,031 kWh, with a reduction in greenhouse gas emissions by 47 tonnes CO₂-e, an estimated annual cost saving of $10,990, with a simple payback of 20 years (excluding solar PV).

The post implementation audit has indicated that full energy savings are yet to be realised, however the energy efficiency measures have resulted in annualised electricity savings of 12,555 kWh per year and greenhouse gas emission savings of 16.8 tonnes CO₂-e per year\(^2\), with an annual cost saving of $2,742.

In addition, the post implementation audit determined that operational costs could be reduced by as much as $26,000 in HVAC maintenance (based on 2012/13 maintenance costs). Therefore, the project has resulted in a simple payback of 10.5 years.

The post implementation audit provided the following evaluation data, including an allowance for changes to the centre:

<table>
<thead>
<tr>
<th>Item</th>
<th>Project Objectives (Original baseline data)</th>
<th>Project Objectives (Revised baseline data)</th>
<th>New baseline data (annualised) – post implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Efficiency</td>
<td>159.8 MJ/m²/year</td>
<td>172.0 MJ/m²/year</td>
<td>121 MJ/m²/year</td>
</tr>
<tr>
<td>Annual MJ</td>
<td>183,815 MJ/year</td>
<td>191,803 MJ/year</td>
<td>146,603 MJ/year</td>
</tr>
<tr>
<td>Annual kWh</td>
<td>51,059 kWh/year</td>
<td>53,278 kWh/year</td>
<td>40,723 kWh/year</td>
</tr>
<tr>
<td>Floor area</td>
<td>1,150 m²</td>
<td>1,150 m²</td>
<td>1,210 m²</td>
</tr>
</tbody>
</table>

\(^1\) Data has been annualised as a full year of data is not yet available.
\(^2\) Based on a CO₂-e factor of 1.336 kg per kWh.
\(^3\) The original baseline data has been revised due to better access to the centre’s energy data over time.

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Demonstration and communications objectives were to include:

- Develop user guides on how to use the building efficiently - in particular, how to use the push button HVAC control
- Signage around the facility with prompts and reinforcement around the energy efficiency measures installed, including labels on switches
- A range of workshops run for user groups, focusing on bill busting for renters and low cost retrofits
- Facility tour of measures installed in the building, and helping them develop skills to translate these to their home environment to save energy there as well
- An open day to show the broader community, other community centres and organisations what has been done, how it was achieved, and how they can implement energy efficiency at home on any budget
- Meetings with other community centres in the local area to share ideas
- Positive media through the website, local papers, newsletters etc.
- Development of take-home information for the user groups such as a large-print fact sheet for elderly and a renters fact sheet for tenants and those in public housing with tips on how they can reduce energy at home using similar principles to those of the Centre
- Developing a Building User Guide including a heating/cooling policy outlining set points.
- "Sustainable Homes Program" courses for residents, staff and user groups

### PROJECT ENERGY EFFICIENCY ACTIVITIES

#### Project Summary

The project was designed to increase the energy efficiency of a community use building and benefit low socio economic and other disadvantaged communities, including:

- Improve energy management practices within the Centre and user groups, reducing costs and therefore retaining the ability to continue to deliver community services
- Reduce the Centre's long term energy expenditure which is having a significant impact on its ability to continue to deliver services to the low socio-economic Frankston North community and surrounds
- Better service and improve amenity of buildings and community facilities
- Improve comfort for elderly users who are gathering around energy 5 x intensive radiator heaters for weeks and months at a time when the HVAC fails
- Minimise energy consumption and costs to manage the impact of the carbon price and rising electricity costs
- Build knowledge and capacity of the energy services and construction industry

*Note: With Council resuming management of the centre, a greater floor area is now billed as the community centre was previously on a separate bill to the maternal and child health centre (paid by Council)*
Contribute to the national effort to reduce electricity use and greenhouse gas emissions.

The project focused on the main community centre and community centre annex.

**Technology selection**

A detailed audit was conducted to identify aspects of the building that would benefit from an energy efficiency retrofit. Through this, a range of technologies were recommended to achieve the best energy saving results, to improve thermal efficiency and reduce consumption through technological improvements.

Deliverables included:

- Decommissioning electric bar heaters (ceiling mounted)
- Removal of a fridge/freezer
- Install removable shadecloth for summer shading
- Delamping and light replacements
- Installation of fixed horizontal louvres for shading
- Install solar hot water heat pump
- Install sensors and timers on external security lights to reduce amount of time they operate
- Installation of ceiling fans
- Installation of ceiling insulation
- Replace HVAC system
- Push button controls
- Install thermal treatments to selected windows (Magnetite)

A 'Marginal Abatement Curve' also known as a cost abatement curve (see below) was developed to examine the costs and impacts of each technology. Many items demonstrated a definite benefit for being cost neutral, with the exception of the fixed horizontal louvres, which had a user comfort benefit, ceiling insulation and lighting replacements that had a longer payback period.

The graph is ordered most financially viable by cost per tonne of CO$_2$ avoided. A negative cost means that even in paying for the measure to be implemented, there is an instant saving. Any bar below the x-axis is an action that pays for itself almost immediately. Any item above the x-axis demonstrates a higher capital investment per tonne of CO$_2$ avoided.

The wider the bars on the graph, the more CO$_2$ avoided.

Items with the highest CO$_2$ avoided are:

- Solar PVs (not implemented but planned for the future)
- Ceiling Insulation
- Replace T8 fluorescent tubes with 19w LED tubes
- Install ceiling fans
- Solar hot water
- Fixed horizontal louvres
- Replacing exit signs with LED
The MAC graph above shows that replacing electric bar heaters with split systems actually saves just over 60 cents per >1 tonne of CO₂-e per year. Upgrading the HVAC system comes at a cost of 20 cents per <1 tonne of CO₂-e per year, however has a range of other economic and social benefits.

**Technology implemented**

Decommissioning electric bar heaters (ceiling mounted)

Ceiling mounted electric radiator heaters are particularly inefficient due to their placement, as heat rises. These were decommissioned and removed, and a timed push button control was placed on the split system for more efficient heat distribution and lower energy consumption.

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Install removable shadecloth for summer shading

Infrastructure was already in place for shadecloth to shade the main hall windows from summer heat, however no shadecloth was present.
UV stable shadecloth was reinstated to provide shading and reduce cooling demand in summer. Feedback from user groups was extremely positive with a noticeable improvement in comfort level experienced by the hall users over summer.

Removable Shadecloth was a UV stabilized High Density Polyethylene (HDPE) shadecloth that was used to protect the windows of the main hall, kitchen and foyer. The product has a minimum 80% UV block that is tear and sag resistant.

Lighting
Recessed lighting is inefficient in both light distribution (compared with pendant and flush mount lights) and in thermal efficiency of the building as it contributes to 'leaks' with heat able to rise up into the ceiling cavity.

Recessed lights were replaced with fixed/closed LED lights to break the thermal loss cycle and consume less electricity than the existing CFL fittings.
The only issue faced was sourcing large enough diameter lights, as the existing recessed lights were >18cm. The lights selected had a smaller footprint than the original lights, as can be seen in the photo.

The post implementation audit showed these lights are operating at 92 degrees – much higher than the standard LED lights which operate at around 30 to 50 degrees. This has been raised with Energy Makeovers, who has confirmed that this is not a fire risk, and they are following up with supplier GE as to whether this is normal for the particular design of light, and is currently under investigation.

Installation of fixed horizontal louvres for shading

Horizontal louvres were installed on windows that had very little shading and suffered significant heat gain in hot weather. The louvres were designed to block summer sun when the sun is high in the sky, but allow in winter sun when the sun is low in the sky and heat gain is welcomed.

Install solar hot water heat pump

A solar heat pump was selected as the most efficient and cost effective form of solar hot water, and could be plumbed into the existing electric 315L hot water storage tank.
This selection was based on the low level of heated water demand from the central 315L unit which is only a couple of years old and therefore has a substantial lifetime ahead of it. The solar heat pump delivers a similar energy saving to an evacuated tube solar system and comes with a 3 year manufacturer warranty.

The Siddons bolt-on model was selected as the optimal solution.

http://www.sidbonsolarsream.com/products/bolt-on

The unit can be programmed to run at predetermined times and can be set to deliver a specific water temperature. This means that you can set the water temperature to be below a scolding temperature for safety yet hot enough to wash dishes and perform other common tasks.

There are a number of instantaneous water boilers on site that can utilised if boiling water is required.

The only issue faced with the installation of the solar heat pump was the roof penetration was not sealed correctly and had to be repaired to prevent future leaks.

Below: Solar heat pump in situ with replaced flushing to prevent future leaks.

Install sensors and timers on external security lights to reduce amount of time they operate

Prior to the project, the security lights were on all night, every night. PIR sensors were installed to activate only once motion is detected, and only after dark.
Installation of ceiling fans

20 Ceiling fans were installed overall (19 initially with an additional one being determined necessary once the building was back in operation).

With thermal efficiency measures installed (shading, insulation etc.), the fans proved adequate enough for the bulk of summer, resulting in significant summer electricity savings.

Signage around the facility has complemented the installation of ceiling fans, advising user groups of the benefits of using a low setting in winter to push the heat down, and reminding them to use fans as a first choice in summer.

Installation of insulation

R4 ceiling insulation was installed. The greatest challenge was coordinating the ceiling insulation with the HVAC works, as roof sheets needed to be removed in order to install the insulation. This caused some delays with the HVAC works commencement, though these were overcome with persistence and time, and the project was completed on time.

Insulation complemented the other works to improve the building’s thermal performance, to reduce the heating and cooling demand.

Due to the height of the roof and difficult access, inspections had to be planned well in advance in order to gain safe access to the roof area via the maintenance contractor who could set up temporary access points.

Insulation was selected to fit the space constraints between the ceiling and the roof, much of which has only a small cavity. Rhino heavy duty foil wrap was coupled with R4.0JM insulation batts (ceiling) and R2.5HD JM Sound Control wall batts.

Replace HVAC system

HVAC replacement was the major component of the project, with the potential to significantly reduce electricity costs and almost eliminate maintenance costs.

The HVAC system consisted of four package units.
HVAC System 1: Hall and stage area

Replace the single 60 kW Airtech A60-20R ducted reverse cycle rooftop packaged unit for the hall. Replace the existing unit with one off 60kW ducted packaged units with a new Airchange rooftop packaged reverse cycle air-conditioner complete with:

The installation of energy/heat recovery and economy cycle:

- New controls
- New electrical wiring
- The installation of return air filter plenum
- The installation of A/H pushbutton switch and hour run meter
- Option for fresh air controls using CO₂ sensors and modulating dampers to maintain CO₂ levels in accordance with AS/NZS1668.2
- The installation of A/H manual on/manual off/auto off adjustable time delay push button.

HVAC System 2: Meeting Rooms, Computer room and Community Renewal Room

Replace single 25 kW Airtech A60-20R ducted reverse cycle rooftop packaged unit with reverse cycle split cassette units complete with O/A provisions to AS/NZS1668.2.

HVAC System 3: The Lounge, foyer and reception, and two small offices adjacent the entrance foyer

Replace the single 25 kW Airtech A60-20R ducted reverse cycle rooftop packaged unit with a 25kW ducted packaged units complete with:

- New ductwork
- New controls
- New electrical wiring
- The installation of return air filter plenum
- The installation of A/H manual on/manual off/auto off adjustable time delay push button.

System 4: Childcare Room

Replace the single 25 kW Airtech A60-20R ducted reverse cycle rooftop packaged unit with a 36kW ducted packaged units with equivalent new A/C complete with:

- New controls
- New electrical wiring
- The installation of return air filter plenum
- The installation of A/H manual on/manual off / auto off adjustable time delay push button.

In summary the energy efficiency measures included the following:

- New packaged A/C units to replace systems 1, 2 and 4
- Separate split systems for the meeting, computer and community rooms to replace system 3
- Localised adjustable time push button afterhours switches for all packaged units. Afterhours run meter for system 1
- Economy cycle for System 1
- Outside air modulation using CO₂ sensor for System 1
- Energy recovery for system 1.

### Below: Specifications summary – Air Conditioning Units

<table>
<thead>
<tr>
<th>Air Conditioning Unit</th>
<th>PAC – AC1</th>
<th>PAC – AC2</th>
<th>PAC – AC3</th>
<th>PAC – AC4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make or Approved Equivalent</td>
<td>Temperzone, Actron</td>
<td>Roof/Ducted</td>
<td>Roof/Ducted</td>
<td>Roof/Ducted</td>
</tr>
<tr>
<td>Unit Type</td>
<td>Roof/Ducted</td>
<td>Roof/Ducted</td>
<td>Roof/Ducted</td>
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<tr>
<td>Number Required</td>
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<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Area Served</td>
<td>Multi Purpose Hall</td>
<td>Meeting &amp; Comp.</td>
<td>Entry &amp; Offices</td>
<td>Child Care</td>
</tr>
<tr>
<td>Indoor Fan Air Flow (L/s)</td>
<td>2880</td>
<td>1000</td>
<td>1300</td>
<td>2100</td>
</tr>
<tr>
<td>Outdoor Air(L/s)</td>
<td>750</td>
<td>400</td>
<td>150</td>
<td>175</td>
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<tr>
<td>Total Cooling Load (kW)</td>
<td>58</td>
<td>16</td>
<td>24</td>
<td>39</td>
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<tr>
<td>Sensible Cooling Load (kW)</td>
<td>45</td>
<td>12</td>
<td>17</td>
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<td>Heating Load (kW)</td>
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<td>13</td>
<td>19</td>
<td>33</td>
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<tr>
<td>Sound Level dBA(A)</td>
<td>&lt; than existing</td>
<td>&lt; than existing</td>
<td>&lt; than existing</td>
<td>&lt; than existing</td>
</tr>
</tbody>
</table>

### Below: Specifications summary – Split Packaged Units

<table>
<thead>
<tr>
<th>Air Conditioning Unit</th>
<th>SP – AC1</th>
<th>SP – AC2</th>
<th>SP – AC3</th>
<th>SP – AC4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make or Approved Equivalent</td>
<td>LG, Fujitsu, Daikin</td>
<td>split</td>
<td>split</td>
<td>split</td>
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<tr>
<td>Unit Type</td>
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<tr>
<td>Number Required</td>
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<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Area Served</td>
<td>Meeting 1</td>
<td>Meeting 1</td>
<td>Meeting 1</td>
<td>Computer Area</td>
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<tr>
<td>Total Cooling Load (kW)</td>
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<tr>
<td>Sensible Cooling Load (kW)</td>
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<tr>
<td>Heating Load (kW)</td>
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<td>4.5</td>
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<td>Sound Level dBA(A) indoor</td>
<td>38</td>
<td>38</td>
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<tr>
<td>Condensing Unit</td>
<td>Roof mounted</td>
<td>Roof mounted</td>
<td>Roof mounted</td>
<td>Roof mounted</td>
</tr>
</tbody>
</table>
Below: Photos of the installed HVAC and ducting

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Push button controls

Push button controls were installed to overcome the human factor of heating and cooling systems being forgotten and left on overnight and on weekends. They also overcome problems with programming a heating and cooling system for set hours, as some days are busier than others, some weeks are busier than others.
The objective was to make it easy for heating and cooling systems to be switched on with the push of a button – essentially 'set and forget' as they turn off automatically after two hours.

Two hours was selected as it is the average duration of a booking. Longer bookings usually find that the space is of adequate temperature after two hours and the system remains switched off.

This represents a significant energy saving, as heating and cooling consists of at least 40% of the building's energy use.

The push button controls were the most challenging of all technologies implemented.

In theory, the buttons (pictured above) link directly to the wall controls (pictured below). A simple press of a button turns on the wall control to a set temperature for a period of two hours.

Technical issues riddled this component of the program, with the Daikin controls proving incompatible with the system.

After many months of tweaking, and negotiations with Daikin, an alternative control system brand was installed and the push buttons became operational. Daikin were unable to explain why their controls did not work.
Install thermal treatments to selected windows (Magnetite)

Magnetite was installed to improve the thermal performance of selected windows. Magnetite is an alternative to double glazing at a fraction of the cost. It consists of a custom made window retrofit that snaps on to an existing window frame using a magnetic strip, creating a thermal buffer much the same as double glazing.

The benefits of magnetite are:

- Noise reduction
- Thermal comfort
- Fits existing windows
- Energy efficiency
- Custom installation

For a video on how magnetite works, visit [http://youtu.be/jiHP9OAp3cc](http://youtu.be/jiHP9OAp3cc)
Magnetite improves Thermal Ratings

Thermal ratings are represented as U-value and Solar Heat Gain Coefficient (SHGC).

A U-value represents the heat transfer through a window irrespective of direct sunlight. For example, heat still moves through a closed window at night-time. The U-value is specific to windows and glass and is the inverse of the commonly used R-value, which is used for insulation properties of walls and other building materials. For this reason the lower the U-Value the better the insulation performance. The U-value is important for measuring the heat transfer both in and out of the window. The more heat transfer that the window can resist the better an insulator it is. It can either stop the heat from coming in on a hot summer day (MAG-01-03) or stop the heat escaping on a cold winter evening (MAG-01-01).

Solar Heat Gain Coefficient (SHGC) is a fraction that is used to indicate the amount of radiant heat that can travel through a window. This coefficient is largely affected by direct sunlight, which is radiant heat. The lower the SHGC, the better the material will stop solar heat coming into the building through the window. A low SHGC is like having a very effective shade over the window, except that the view will be less restricted. In the summertime it is important for this number to be as low as possible as we are trying to minimise unwanted solar heat gain. In a winter climate we are trying to keep this number as high as possible as it is important to let the solar heat in but not let it out.
Winter

In winter the ideal situation is to let in as much of the sun's heat and then trap it inside to maintain a comfortable environment in your home or office. This will also greatly reduce heating costs and directly relate to money savings. The ideal window for winter will have a high SHGC to let the sun's heat in and a low U-Value to prevent the heat from escaping. Clear windows without shading films are better suited for winter climates.

Summer

In summer the ideal situation is to minimise the heat coming in from outside and prevent the cool air inside from escaping through the window. This will make your home more comfortable and reduce your air-conditioning costs. The ideal window for summer, or for a large west-facing window, will have a low SHGC to limit the heat from the sun's direct rays, as well as, a low U-Value to prevent the heat in the air outside from moving through the window and warming the cool conditioned air inside. It is better to have a shading film on the first (outer) glass pane to limit the heat that enters the double glazed unit.

Fit for purpose

The community centre had powder coated aluminium single glazed windows with limited shading. Users found some of the spaces to be uncomfortably hot in summer and uncomfortably cold in winter. Installing the magnetite to these windows had an immediate impact on heat loss and gain of over 30% (see table below)

<table>
<thead>
<tr>
<th></th>
<th>Aluminium frame &amp; clear glass</th>
<th>Timber frame &amp; clear glass</th>
<th>Aluminium frame &amp; clear glass with Magnetite</th>
<th>Timber frame &amp; clear glass with Magnetite</th>
<th>Timber frame &amp; ultra tint glass with Magnetite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling Stars</td>
<td>0</td>
<td></td>
<td>2 stars</td>
<td>3 stars</td>
<td>4 stars</td>
</tr>
<tr>
<td>Heating Stars</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% improvement on household cooling</td>
<td>2%</td>
<td></td>
<td>20%</td>
<td>35%</td>
<td>39%</td>
</tr>
<tr>
<td>% improvement on household heating</td>
<td>0%</td>
<td></td>
<td>24%</td>
<td>58%</td>
<td>62%</td>
</tr>
<tr>
<td>U-Value</td>
<td>7.4</td>
<td></td>
<td>5.5</td>
<td>2.9</td>
<td>2.5</td>
</tr>
<tr>
<td>% improvement</td>
<td></td>
<td></td>
<td>25.7%</td>
<td>60.8%</td>
<td>66.2%</td>
</tr>
<tr>
<td>SHGC</td>
<td>0.77</td>
<td></td>
<td>0.69</td>
<td>0.67</td>
<td>0.66</td>
</tr>
<tr>
<td>% change</td>
<td>10.4%</td>
<td></td>
<td>13%</td>
<td>14.3%</td>
<td>75.3%</td>
</tr>
</tbody>
</table>

* % Improvements are compared with the generic base case 3mm aluminium window from WERS
Project Demonstration and Communications Activities
The funding enabled the promotion of the project's activities in order to communicate the energy efficiency measures and their effectiveness, and empower transfer of knowledge to the community to assist them in implementing some of these measures at home – for both renters and low income home owners.

Communication activities primarily targeted residents in the local Frankston North area through the community centre, and Frankston City residents more generally through access to workshops and information. Key goals were to engage with local low income residents who may be struggling with electricity costs.

The local community was informed about the project and its benefits through print media in Council’s newsletter, Frankston City News, two open days – one focused solely on the project, and one as a part of a larger Neighbour Day activity. Both workshops featured an energy efficiency consultant to provide individual advice to residents, and handed out draft sealing door seals to help them on their way.

Nine workshops were also held in the Frankston North catchment to educate and empower residents with ways they can reduce their electricity costs and maintain comfort for little to no expense, and particularly focused on tips for renters.

Signage around the centre has also extended the reach of the information so that it is front-of-mind for centre users.

User guides
- A User Guide was developed to educate user groups on ways to use the building efficiently - in particular, how to use the push button HVAC control.
• The building user guide advised user groups of temperature set points, and groups were particularly intrigued by the use of fans in winter to push the warm air down
• The guide was kept very simple, using images and clear language in order to be accessible to a wide range of users
• The guide is provided to user groups with their booking information

Below: The Building User Guide

Heating and Cooling – Main Building

Press once and heating/cooling will come on for 2 hours to the set temperature (20-23 degrees in cool weather, 21-24 degrees in warm weather). If you think the temperature settings are not working correctly, please let the office know.

Press only the one you need:

- MAIN
- MEETING ROOMS
- OFFICES
- CHILDCARE

Heating and Cooling – Annex

Press once and heating/cooling will come on for 2 hours to the set temperature (20-23 degrees in cool weather, 21-24 degrees in warm weather). If the area has not reached the temperature you need in 90 minutes, press again.

There is no need to turn the system off. This will happen automatically after 90 minutes if the button is not being pressed.

Remember to switch off when you leave!
Heating and Cooling – Main Building

Press once and heating/cooling will come on for 2 hours to the set temperature (18-23 degrees in cool weather, 21-24 degrees in warm weather). If you think the temperature settings are not working correctly, please let the office know.

Press only the one you need:

- Hall
- Meeting Rooms
- Offices
- Childcare

Heating and Cooling – Annex

Press once and heating/cooling will come on for 30 MINUTES to the set temperature (18-23 degrees in cool weather, 21-24 degrees in warm weather). If the area has not reached the temperature you need in 30 minutes, press again.

There is no need to turn the system off. This will happen automatically after 30 minutes of the button not being pressed.
Signage
Signage was installed around the facility with prompts and reinforcement around the energy efficiency measures installed, including labels on switches:

**Lights**

New energy efficient LED lights are now lighting your space. Please remember to turn them off when your booking is finished.

*Remember to switch off when you leave!*

---

**Fans can be used in Summer AND in Winter:**

In winter, use the ceiling fans on the lowest setting to circulate warm air back down. Remember – heat rises!

In Summer, use the fans for cooling wherever possible – this uses only a fraction of the electricity (and cost!) of refrigerated air conditioning.
Remember to switch off when you leave

For 2 hours of heating or cooling, press the button for your booked room

HALL  MEETING ROOMS  OFFICES  CHILDCARE
Use the fan on a **low setting in winter**
to push warm air down

Use the fan on a **high setting in summer**
to cool your skin

**Lights**

New energy efficient LED lights are now lighting your space.

Please remember to turn them off when your booking is finished.
Annex split system

Press for 30 minutes of heating or cooling (temperature is set automatically).

Can be pressed again when system turns off if still required.

Diagram 1

Did you know?

The hot water coming out of this tap is powered by an energy efficient heat pump.
Window insulation

You will see that some of our windows have a double glazing retrofit. It is called Magnetite and reduces heat gain in summer and loss of heat in winter.

Remember to switch off when you leave

Workshops

A range of nine workshops were run for user groups, focusing on bill busting for renters and low cost retrofits. An average of 18 people attended each workshop. Interestingly, low income households were the most difficult to engage, with many homeowners attending the renters workshops. Discussions have commenced with community care workers to find other ways to engage with low income and at risk families through linking in with community care programs.

A separate workshop was also trialed to engage with local business.
"Sustainable Homes Program" courses for residents, staff and user groups guided the workshop material, however just the energy component was delivered as a part of the project. The Course includes other aspects such as sustainable gardening, which was delivered separately from the project.

<table>
<thead>
<tr>
<th>Event name</th>
<th>Date</th>
<th>Location</th>
<th>Attendance/ comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Bill Busters for Seniors</td>
<td>Apr 30, 2015 11am</td>
<td>Leawarra House Frankston</td>
<td>22</td>
</tr>
<tr>
<td>Cosy Autumn Homes - D.I.Y. Energy Saving Tips</td>
<td>Apr 21, 2015 10am</td>
<td>Frankston North Community Centre</td>
<td>14</td>
</tr>
<tr>
<td>Open day - Interactive display with an energy efficiency consultant giving advice</td>
<td>Mar 28, 2015 11am</td>
<td>Frankston North Community Centre</td>
<td>Approx 200 people</td>
</tr>
<tr>
<td>Cool Summer Homes - DIY Energy Saving Tips</td>
<td>Feb 27, 2015 10am</td>
<td>Orwil St Community House Frankston</td>
<td>18</td>
</tr>
<tr>
<td>Open Day, tour, display, Q&amp;A</td>
<td>Nov 18, 2014 12pm</td>
<td>Mahogany Neighbourhood Centre</td>
<td>Open day and tour</td>
</tr>
<tr>
<td>Cool Summer Homes - DIY tips</td>
<td>Nov 14, 2014 1pm</td>
<td>Belvedere Community Centre Inc. Seaford</td>
<td>15</td>
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<tr>
<td>Energy Bill Busters for Seniors</td>
<td>Oct 17, 2014 1:30pm</td>
<td>Frankston Library</td>
<td>25</td>
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<tr>
<td>Warm Winter Homes – DIY energy saving tips</td>
<td>July 18, 2014 10am</td>
<td>Karingal PLACE Community Centre Frankston</td>
<td>20</td>
</tr>
<tr>
<td>Business Sustainability Workshop</td>
<td>June 20, 2014 8pm</td>
<td>Mahogany Neighbourhood Centre</td>
<td>8</td>
</tr>
<tr>
<td>Tips for Renters to Winterproof your home</td>
<td>May 17, 2014 10am</td>
<td>Mahogany Neighbourhood Centre</td>
<td>18</td>
</tr>
<tr>
<td>Tips for Home owners to Winterproof your home</td>
<td>May 17, 2014 12pm</td>
<td>Mahogany Neighbourhood Centre</td>
<td>22</td>
</tr>
</tbody>
</table>
Business Sustainability Workshop

Friday 20 June 2014
8am—11am
Meeting Room 2, Mahogany Neighbourhood Centre, Mahogany Drive, Frankston North
FREE Workshop, RSVP by 12 June 2014
Email - ella.boyen@frankston.vic.gov.au

Beyond Green:
Business opportunities of the next generation of sustainability innovation
Recent developments in technology and business best practice have created a new wave of innovation and opportunity:

- Learn the straightforward principles at the heart of emerging business sustainability best practice
- Improve your understanding of the wealth of opportunities being delivered by the next generation of sustainability innovation
- Build strategic insight into the emerging shifts that can radically improve business, social and environmental results

Facilitated by Leigh Baker from Balance - Regenerative Thinking in Action
Leigh Baker is an experienced supply chain innovator and sustainability educator. She combines her deep real-world understanding of sustainable business innovation with her work as a productivity coach teaching 'the how of the how' of getting things done with grace and style, not just hard work.

Australian Government

This activity received funding from the Australian Government as part of the Community Energy Efficiency Program.

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HOME ENERGY BUSTER SESSION and SOLAR PANEL INFORMATION SESSION

This Autumn, take the heat off your power bills!

Local facilitator Elia shows how easy it can be to reduce energy at home.

When:
Home Energy Buster session
Wednesday 12 March 2014
5:00 pm to 6:30 pm
Solar Panel Information session
Wednesday 12 March 2014
7:00 pm to 8:00 pm

Where:
Mahogany Community Centre
26 Mahogany Avenue, Frankston North

You are welcome to come to one or both sessions.

Phone 9768 1628 to book and for more information.

- Facts to help you save money
- Relaxed social setting
Open Days and tours

Two open days were held in total, in November and March respectively.

The first open day (18 November 2014) focused solely on the project. It included an energy efficiency workshop, tour and interactive display. Although well-advertised, attendance was very low (five people). Despite the low numbers, the quality of information sharing was high and the attendees left feeling extremely empowered and informed to implement energy efficiency actions at home.

The facility tour of measures installed in the building helped participants develop energy saving skills to translate to their home environment.
Below: Photos of display and measures highlighted on open day tour
Magnetite on windows
Neighbour Day Event

The March 2015 open day was a broader community event for Neighbour Day, with a wide range of community activities – energy efficiency display and advice being just one of those. The event was attended by over 200 local residents, and Energy Makeovers managed a stall to provided energy efficiency advice, and provide draft seals for doors as well as energy efficient light globes. Feedback from Energy Makeovers indicated that most residents had already undertaken draft sealing and light bulb replacement at home.
NEIGHBOUR DAY

Frankston North Community Centre
26 Mahogany Ave
Frankston North

28 March 2015 11:00am - 2:00pm

OUR DOORS ARE OPEN!
Come in and meet your neighbours,
enjoy free family activities and
tell us what you would like
to see at the centre.

Jumping Castle • Sausage Sizzle • Games
Music • Kids Corner • Face Painting
Name The Centre & More!

Frankston City
Ideas sharing

The project manager met with other community centre staff in the broader Frankston area to share the ideas about what had been implemented at Mahogany, in the lead up to the energy saving workshops held at those centres.

Print Media

Positive media about the project was achieved through Council’s website, local papers, newsletters etc.

Frankston North Community Centre

Thank you to all the local residents, groups, schools and organisations who have shared their feedback on what they would like to see offered at the Frankston North Community Centre.

Term two at the Centre includes a range of new programs including:

- Yoga and a wide variety of fitness classes
- Healthy Bites Playgroup
- Creative Play
- Training in Computers and Hospitality

City Life serves a free Community Meal at the Centre on Mondays at 5.30pm. Doors are open to all from 4pm.

Lots of opportunities to have some fun, stay active and meet others in the community are available at the Centre.

Collect a Term two program from the Centre which is open Monday to Friday 9am - 5pm, 26 Mahogany Avenue, Frankston North, phone 8773 9545

More than 200 people joined in Frankston North Community Centre’s Neighbour Day celebrations including Gwen Dearsley, Marlon Beattie, the Mayor Cr Sandra Mayer and Chris Tudor.


Energy Bill Busters for Seniors

Friday 17 October, 1.30–3pm
Frankston Library, 60 Payne Street, Frankston
Take the heat off your spring energy bills with cheap and easy things everyone can do: renters or owners.

Cool Summer Homes – Do it Yourself

Friday 14 November, 1–3pm
Belvedere Community Centre, 36 Belvedere Road, Seaford
Take the heat off your summer energy bills with cheap and easy tips – whether you rent or own.
Making Council Buildings More Energy Efficient

Council is progressively implementing sustainability initiatives across the city and the Mahogany Neighbourhood Centre in Frankston North is the next building to receive an energy upgrade. As well as replacing lighting, installing ceiling insulation and treating windows to prevent heat loss and gain, a new heating and cooling system will be installed.

This replaces the current inefficient system which is more than 40 years old and contributes around 60 per cent of the Centre’s electricity bills.

A range of community workshops will also be held to help renters, home owners and businesses to reduce their own electricity bills.

These works are possible thanks to an Australian Government grant of $177,566. Council is also contributing $91,000 to complete the project.

This will greatly improve the energy efficiency and reduce the running costs of the Centre. An open day and tour will be held for the community once works are complete.

Greening our Future

FREE Events for Smart Living

Tips for Renters to Winterproof your Home
Saturday 17 May, 10am–11.30am, Mahogany Community Centre, Frankston North

Learn how to take the heat off your energy bills. Covering simple tips for renters to save energy and still stay warm through winter.

Tips for Home Owners to Winterproof your Home
Saturday 17 May, 12.30pm–2pm, Mahogany Community Centre, Frankston North

Learn how to take the heat off your energy bills. Covering simple tips for home owners to save energy and still stay warm through winter.

Woodlands for Wildlife
Sunday 25 May, 10am–3.30pm, Woodleigh School, Langwarrin

Learn about your bushland property, the wildlife that live there, funding opportunities and grants. A great way to get to know your neighbours.

Bookings: 9768 1628 or environment@frankston.vic.gov.au
10 Cheap Ways to Keep Cool at Home During a Heatwave

When it’s too hot for too long the summer heat can become a serious problem. If your home gets really hot during a heatwave and you don’t want to spend a bucket of cash on keeping the place cool, then this information is for you.

**Free Air Conditioning**
Place a bowl of ice on a chair in front of a pedestal fan for an instant air conditioning effect. You can also angle a couple of fans in a room to create a cross breeze.

**Egyptian Method**
Run a hand towel or a shawl under cold water and place it around your neck. When it dries out or if the towel starts to get hot, rinse and repeat.

**Clothing ‘Au Naturel’**
Wear loose-fitting natural fibres like cotton around the house to stay comfy and cool.

**Water Makeup**
Keep a spray bottle filled with water in the fridge to spritz yourself and your pets or enjoy an ‘icy’ pedicure by popping your feet in a bucket of cold water.

**Icy Shots**
Fill ice trays with juice, cover the trays with foil and put a toothpick in each square then place in the freezer. One hour later, you have mini icy poles you can enjoy throughout the day!

**Drink up**
Stay hydrated with lots of water. And don’t forget about your pets – make sure their water bowl is full. Another smart move is to drink your beverages cool but not ice cold. Very cold drinks can cause stomach cramps.

**Eat Cool**
Avoid turning on the oven or stove to cook a hot meal. This will lower the temperature in your home as well as your energy bills. Eat high water content foods like fruit and salad.

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**Keep it Cool this Summer**

This summer is predicted to be a scorcher. Remember to leave a shallow bowl of water out for wildlife, and place a rock or weighted stick inside to prevent smaller animals drowning.

Keep your house cool this summer and reduce your energy bills by shading your house from the blazing sun. *Myoporrum insulare* (aka Boobialla) is a fast growing local plant often used as a firebreak plant due to its high moisture content.

Save on energy bills by investing in a pedestal fan and a water sprayer. You can keep cool for a fraction of the cost of expensive air conditioning.

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Cosy Autumn Homes – “Do It Yourself” Tips
Tuesday 21 April, 10–11.30am
Frankston North Community Centre
26 Mahogany Avenue, Frankston North
Cheap and easy DIY tips for renters or owners: make your house cosy this autumn, while reducing your energy bills.
It is Your Community Centre

By Cr Glenn Aitken – Deputy Mayor

The Frankston North Community Centre is a place where you can connect with other people in your community.

The centre is now managed and run by Council and provides a huge opportunity to bring a diverse range of services to the community.

The full strength of Council's resources and support will build on the previous work of the Centre.

Council’s vision and hopes for the Centre include:

• A friendly and welcome atmosphere
• A place which feels ‘alive’ as host to a number of vibrant activities and programs
• Inclusion for all ages and backgrounds
• A focus on arts, education and life skills
• A place for personal development and community connection

We want to know what you want for your Community Centre – so you can make it your own.

Warm winter homes – DIY energy saving tips

Saturday 18 July, 10am–11.30am
Karingal PLACE,
103 Ashleigh Avenue, Frankston
Register:
warmwinterhomes.eventbrite.com

Take the heat off your energy bills, with practical tips to stay cosy while saving energy, whether you own or rent your home.

All events are free, but bookings are essential. Please book online at the Eventbrite links. If you don’t have online access you can leave a phone message on 9768 1628.

Large-print fact sheet for elderly and a renters fact sheet for tenants
Development of take-home information sheet for the user groups such as a large-print fact sheet for elderly and a renters fact sheet for tenants was developed, with tips on how they can reduce energy at home using similar principles to those of the centre.

OUTCOMES AND BENEFITS OF THE PROJECT

Overview
Full energy saving outcomes are yet to be realised as identified in the post implementation audit, however the community has benefited from better services and improved comfort in community buildings and facilities as well as reduced energy consumption and costs.

Some of these include:

- A reduction in energy consumption despite the centre being open longer hours
- Feedback from user groups about the increased comfort during summer — user groups found the ceiling fans sufficient most days and rarely turned on the HVAC system

Energy Efficiency outcomes

Baseline energy usage
In the original energy audit, electricity and gas data was analysed prior to project commencement. The total actual electricity consumption at Mahogany Neighbourhood Centre was 48,750 kWh over the period from October 2011 to September 2012, resulting in a total cost of over $13,000 and approximately 65 tonnes of greenhouse gas emissions.

Figure 1: Electricity consumption, cost and greenhouse gas emissions
Gas consumption and associated greenhouse gas emissions and costs over the period from August 2011 to July 2012 are illustrated below. Analysis shows that over this period gas consumption at Mahogany Neighbourhood Centre was 8,315 MJ, resulting in greenhouse gas emissions of over 400 kilograms and utility costs of approximately $350.

**Figure 2: Gas consumption, cost and greenhouse gas emissions**

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A detailed energy consumption profile was also generated to identify which areas of the centre consume what proportion of energy. This information helped to identify which areas of the building to prioritise when considering which recommended actions to implement.

Analysis of all equipment and appliances onsite was undertaken, identifying both the demand (kW for electrical and MJ for gas) and the estimated operating hours for all items. This generated an estimated total kWh for electrical equipment, and MJ for gas-powered equipment. The estimated energy use of the site was then reconciled with the billing data provided. To meet the AS 3598:2000 Energy Audits the estimated electrical load was within +/- 20% for the measured billing data.
Energy Efficiency outcomes

Baseline annual energy usage (project commencement) = 191,803 MJ
Annualised energy usage after implementation = 146,603 MJ (40,723 kWh/year)
Annualised energy savings = 45,200 MJ (or 24% reduction)

From the most recent data (from May 2014 to April 2015), the average electricity usage of the centre has decreased from 492 kJ/m²/day, to 333 kJ/m²/day, which is a decrease of 32%. The increase in savings may be due to the closure of the centre during its transition in management to Council.

There has been a steady decrease in daily electricity usage, as seen in Graph 4 below.
The electricity meter at the centre was upgraded to a remotely read interval meter in June 2014, but only became fully operational on 13 July 2014. This data has allowed greater focus to be applied to the patterns of usage, and correlations of usage with patronage and the weather conditions. Once a full year of interval data becomes available, more detailed assessment of the relative savings factors could be determined.

Previous usage was obtained from monthly electricity invoices to the centre, and usage during the transitional period was calculated from manual readings of the meter. This data has enabled analysis at an average daily usage level that has been used in this report.

From a baseline of 53,278 kWh or 191.8 GJ of electricity usage in 2012-13, the annualised usage since 13 July 2014 is 40,723 kWh or 146.6 GJ in 2014-15, an estimated decrease of 24%. When the change in usable floor area is included the comparison is 172 MJ/m² in 2012-13, and an estimated 121 MJ/m² in 2014-15, an estimated decrease of 30%.

Energy reductions resulted from upgrading the HVAC system, which in cool weather can consume over 60% of the electricity at the centre. The average daily profile (dotted line = trend line) of the centre shows a very strong spike in usage just after opening, which is even more pronounced on days cooler than the normal with high visitation.
The post implementation report identified further opportunities to reduce the energy consumption through improving the airlock seal on the main doors, and most other exit doors, where significant cold drafts are entering the building. This is increasing the load on the HVAC system. Refer to the attached post implementation audit for more detailed information.

The external shading and louvres have assisted with reducing the peak summer electricity usage from 368 kJ/m² per day in 2013 to 183 kJ/m² per day in 2015, a decrease of 50%. The centre was not fully operational in early January 2015, so just comparing the month of February the decrease in energy usage was 32%.

The window treatments with Magnetite has effectively double glazed the aluminium framed windows and reduced heat loss and gain. According to the manufacturer this has decreased the U-value from 7 to 3, effectively providing a 58% improvement in containing the heated air. Direct temperature measurements of the window treatments, compare to a standard non-treated window, showed a 47% improvement to the treated windows in terms of temperature.

The project has resulted in annualised electricity consumption savings of approximately 12,555 kWh per year and greenhouse gas emission savings of 16.8 tonnes CO₂-e per year with an estimated payback of 10.5 years.

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Demonstration and Communication outcomes

Evaluation was undertaken at all workshops, with all participants indicating an increase of knowledge about energy efficiency as a result of having attended the workshop.

In regards to actual activities undertaken at home, the Neighbour Day event indicated that three quarters of visitors to the energy efficiency stall had already undertaken draft proofing.

The event was attended by over 200 local residents, and Energy Makeovers managed a stall to provide energy efficiency advice and draft seals for doors as well as energy efficient light globes. Feedback from Energy Makeovers indicated that most residents had already undertaken draft sealing and light bulb replacement at home.

In total through the events and activities, around 400 local residents were engaged through face to face energy efficiency education.

Qualitative feedback from workshops has also been fabulous, with residents reporting back their trials with bubble wrap on windows (a novel but effective glass insulation technique for low budgets), draft sealing, blocking chimneys and retrofitting pelmets (even if just made of cardboard) to improve winter heat retention and reduce summer heat gain.

All feedback received from the community has been extremely positive.

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Good afternoon Ella,

well may I say the most valuable thing I took away from your presentation was registering for the energyaasy site. How very interesting it is to be able to judge your own consumption needs and see what turning off appliances does. One very interesting thing that has come to my attention is my meter keeps failing. So far on two separate occasions when it fails to send up the reading to the supplier they charge me what they call an average...22kwh per day. It was only that I was actually away one day and at work the other I became suspicious of the reading. On the first occasion they advised it will be rectified however it will take 4-6 weeks. On the next occasion they advised they cannot get an answer they have to go back to the distributor and ask them to fix it. Now for the best part, they have never heard of this happening to anyone before, they also advised me don't complain to energy supplier as they will only say ask your distributor to fix it.

I turn off everything when not home at the power point (fridge excluded) changed my globes under the govt scheme 1/2 new globes and transformers and half globes were done for free (low traffic areas) I can now say I have cut my consumption from the area average of 11kwh per day to around 4-6kwh per day. No teenage children in the house all left home...phew!!!

Winter will be my test as I love my heated towel rail, electric blanket, and cranking up the heat.

I think it's fantastic that the council has done all the research and offers such great services. Yes none of us want to pay more rates, however when we see our rates being put to good uses it proves and increase is necessary.

Regards,

Dominique Jeremiah

On Mon, Mar 2, 2015 at 9:37 AM, Ella Boyen <Essa.Boyen@frankston.vic.gov.au> wrote:

Hello!

Great to meet most of you at the workshop on Friday.

As requested, I have attached the presentation so that you can revisit some of the tips and weblinks.

The other good website I mentioned was www.youhome.gov.au

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Long term, Council would like to see a downward trend in energy use by the Frankston North community. Whilst there are many factors involved (including rising electricity costs), it is hoped that the residents engaged in the project now have the knowledge and confidence to take charge or their energy efficiency journey.

**Benefits to low socio-economic or disadvantaged groups**

About our community

2011 Census:

Frankston North has a population of 5,626, consisting of 1,443 families. Of this, 2,145 people reported being in the labour force, aged 15 years and over. The labour force has high unemployment at 12.9% (276 people). Unemployment is more than double that of Victoria (5.6%) and Australia (5.4%). Only 12.0% of families (173 families) had both adults working full time. 33.0% of families (476 families) have both adults unemployed. 2.0% of total Frankston Nth population (113 people) is Aboriginal and Torres Strait Islander.

The total labour force (including unemployed) is 2,142 (38%) of the total population. 20% (428 people) of the workforce consists of labourers and unskilled workers. 53.0% (1,135 people) of the workforce is blue collar.

The median weekly income in Frankston North is significantly lower than state and national medians:

- Individual weekly income $382 = 32.0% lower than Victoria ($561) and 34.0% lower than Australia ($577)
- Family weekly income is $889 = 39.0% lower than that of Victoria ($1,460) and 40.0% lower than Australia ($1,481)
- Total household income is $760 = 37.5% lower than Victoria ($1,216) and 38.4% lower than Australia ($1,234).
- 37.9% of households had a weekly household income of less than $600, compared with Victoria (23.8%) and Australia (23.7%)

37.0% (534 families) of Frankston North families are single parent, single income families. This is more than double that of Victoria (15.5%) and Australia (15.9%). This is clearly a community in crisis that relies heavily on low cost community services provided by the Neighbourhood Centre.

42.3% of homes are rented, compared with that of Victoria (26.5%) and Australia (29.6%). Home ownership is about a third lower than that of Victoria and Australia. Rent consumes 30.0% or more of the average family income for 14.5% of Frankston North households, as opposed to 9.1% in Victoria and 10.4% for Australia.

How the Centre benefits our community

The Neighbourhood Centre is accessible to the local community for free and low cost assistance in areas including:

- Low income support
- Free tax advice
- Financial Counselling
- Computer skills
- Support for migrants
- Cook low cost, tasty & nutritious meals
- Learn quick and easy recipes and cooking techniques
- Get involved and meet people in your local community
• Children’s and family activities;
• Community activities and events;
• Health and wellbeing courses;
• Senior citizens clubs;
• Music clubs;
• Youth activities

• Opportunities to develop existing skills or
  learn new skills
• Opportunities for volunteer participation
• A meeting place for the community
• A safe refuge during heatwaves and
  brownout

Capacity Building - Industry
The project contributed to the greater knowledge and capacity in the energy efficiency industry through:

• Learnings from push button controls on split system and HVAC systems, in terms of set times and compatibility
• Use of GU10 LED lighting as opposed to MR16, as no driver/transformer is needed, reducing failure rates and extending lights. This will be monitored over time.
• Post implementation audit identified high energy use on cold days, leading to an investigation into the building envelope. More draft proofing has been identified to reduce the heating demand and will be installed in the coming months.

Capacity Building - community
Reducing the operational cost of running the service has benefitted the community by the centre being able to run in all weather. Previously, the HVAC system was inefficient, impacting operational costs, and regularly breaking down, costing Council $26,000 per year to maintain, and making the centre unusable particularly elderly user groups in extremes of weather.

User groups were engaged throughout the process with 'upskilling' and user guides on how to use the building efficiently - in particular, how to use the push button HVAC control, how to understand the light sensors and using the fans in favour of the HVAC (which has resulted in significant energy savings).

Workshops were run for user groups, staff, and the general community to understand energy efficiency, have a tour of measures installed in the building, and helping them develop skills to translate these to their home environment to save energy there as well.

The open days provided an opportunity to engage with the community on draft proofing and energy efficient lighting, and introduced them to services available under the Victorian Government’s VEET scheme.

By continuing to offer the workshops in various formats for different user groups, the centre aims to educate a broad section of this disadvantaged community on an ongoing basis.

Results will be monitored through both evaluation/feedback forms and surveys asking what participants learnt, implemented, and any savings they have made off their electricity bill.

Long term results aim to see a reduction in the average electricity use in kWh in the suburb, using data from United Energy. Whilst the whole suburb measurement approach can't be attributed entirely to the workshops, it will provide information and data around electricity trends over time.

The project contributed to the greater knowledge and capacity in the community evidenced through:
- One on one communication with residents identifying they had already installed draft proofing and energy efficiency lighting
- Feedback from residents at workshops on what they had implemented and increased confidence in understanding their electricity usage

BUDGET

The project was achieved on time and very close to being on budget. Construction costs were slightly higher than the original budget (additional $4,763.90), however these were covered by savings from other capital works projects (approx. $4,000), a reimbursement for the VEECs created ($1,134), and a reimbursement from one contractor ($488) for completion of heater decommissioning.

Causes of the budget changes were from the original budget being estimated rather than fully quoted at the time of submitting the grant, and some lights being missed in the initial audit, as well as price rises (such as CPI) from the initial application to the time of implementation.

Further works required for the HVAC were identified during the construction, and quotes have been obtained to address these in future years. These included improving ducting infrastructure.

Having the one person manage the project, budget and all reporting, streamlined the process.

Budget and expenditure summary ex GST

<table>
<thead>
<tr>
<th>Item</th>
<th>Actual</th>
<th>Budgeted</th>
<th>Variation</th>
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<td>$223,099.00</td>
<td>-$6,196.96</td>
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<tr>
<td>Project Management - Labour</td>
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<td>$23,400.00</td>
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<td>Auditing and Consulting</td>
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Budget and expenditure detailed ex GST

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<td>Construction</td>
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<tr>
<td>Ceiling Heater removal</td>
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<td>Construction Total</td>
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<td>Project Management - Labour</td>
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<td>Project Management - Ian Waters</td>
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<td>Project Management - Labour Total</td>
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Data Auditing  $2,000.00
Financial Audit #1  $600.00
Budget: Auditing and Consulting  $13,244.00
(PENDING) Follow up audit and data analysis  $1,987.50
Initial Energy Audit - Paid for prior to grant  $5,244.00
(PENDING) Financial Audit - Project Completion
Southern Partners  $600.00
(PENDING) Financial Audit - Project Completion Total  $600.00
Auditing and Consulting Total  $12,415.14  $13,244.00

Education and Media
Open Day - Education Display  $1,272.26
Open Day Catering  $47.73
Workshop  $2,500.00
Budget: Education and Media  $8,000.00
Labour - Ella Boyen  $3,304.29
Education and Media Total  $7,124.28  $8,000.00

Grand Total  $272,506.90  $267,743.00

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<td>Frankston City Council</td>
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<td>$93,331.12</td>
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<td>VEECs</td>
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<tr>
<td>Contractor reimbursement</td>
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Milestone Payments

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<td>The Date the Agreement has been signed by both Parties. 16 December 2013</td>
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<td>Submission of the Project Plan for acceptance by the Department.</td>
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<td>indicates the successful completion of</td>
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<tr>
<td>the following components of the</td>
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<tr>
<td>Activity:</td>
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<tr>
<td>- Finalise plan, design and</td>
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<tr>
<td>procurement in accordance with</td>
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<td>section 1.30 Procurement Plan</td>
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<td>- Award Tender</td>
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<tr>
<td>level of Other Contributions made in</td>
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<tr>
<td>relation to the completion of the</td>
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<td>Milestone.</td>
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<tr>
<td>- updated Project Energy Efficiency</td>
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<td>Template for each building, site or</td>
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<tr>
<td>facility that is part of the Activity</td>
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<td>prepared in accordance with the</td>
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<td>Energy Usage and Efficiency</td>
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<td>Improvement Guidance provided at</td>
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<td>Annexure A and templates at</td>
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<td>Attachments A and B;</td>
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<td>- Install and commission HVAC</td>
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<tr>
<td>- Install and commission Energy</td>
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<td>works pg 4 of PP)</td>
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<td>level of Other Contributions made in</td>
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<td>relation to the completion of the</td>
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<td>accordance with clause 8 of the</td>
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<tr>
<td>indicates the successful completion of</td>
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<tr>
<td>the Social Benefit Initiatives (Section</td>
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<tr>
<td>1.19 pg11) which includes demonstration and</td>
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<tr>
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<td>Communications Plan:</td>
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<td>- Produce educational poster/flier</td>
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<td>for building users</td>
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<tr>
<td>- Publish newsletter article/fact</td>
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<td>sheet in print and website</td>
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<tr>
<td>- Complete workshops for community and</td>
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<tr>
<td>staff</td>
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<table>
<thead>
<tr>
<th>Milestone Description and Deliverables</th>
<th>Milestone Date</th>
<th>Departmental Funding (GST exclusive)</th>
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<tbody>
<tr>
<td>- Undertake Open day</td>
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<td>[not less than 10% of the total funding or $200,000, whichever is the lower]</td>
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The Milestone Report must include the level of Other Contributions made in relation to the completion of the Milestone.

7. **Final Milestone**

Submission of a Final Report:

a) in accordance with Schedule 4;

b) for acceptance by the Department in accordance with clause 8 of the Agreement.

Submission of a Financial Report for acceptance by the Department in accordance with clause 8 of the Agreement.

| Total | $177,566 |

**Value for money**

The project achieved the following value for money:

- The Centre is a non-profit community organisation with a focus on low socio economic groups, assisting valuable social; services for an at-risk community
- Energy savings of approximately $2,742 per annum to the Centre’s electricity bills, relieving pressure on finances and increasing the ability to provide services to their community
- In addition, the project is predicted to save approximately $26,000 in HVAC maintenance costs, which could be diverted into maintaining community services
- The capital cost to implement this project was $272,506, with a simple payback of 10.5 years, based on maintenance and electricity costs
- Project was tendered under Australian Standards to ensure testing the market, value for money on services and products installed, and Australian owned contractor companies/sole traders/SMEs.

As the centre is a community asset in a low income community that has little community infrastructure, investing in this facility is of great benefit for maintaining and improving community connectedness, rather than leaving the community as a low priority ‘forgotten’ community, which is how many of our community members feel when it comes to services and infrastructure.

**PROJECT OPERATION, MECHANISMS AND PROCESSES**

**Project Delivery**

A project manager was appointed internally on a casual basis for one to two days a week to manage the project. During the tendering stage, more hours were needed in order to manage the daily administration, communications and evaluation. Once the lead contractor was appointed, one day a week was sufficient to manage the project.
The time taken to gain approval for the appointment of the suitably qualified and experienced project manager put some pressure on the project timelines, however hard work and dedication saw the project delivered on time.

A project steering group was established by the project manager to ensure all stakeholders were kept informed throughout the planning and project delivery. The project team consisted of: a project sponsor, project manager, Mahogany centre manager, centre administration, and contracts and purchasing representative from Council.

The lead contractor managed the day-to-day operations, communications and coordination of all stakeholders as well as implementation of the project.

The project was tendered with assistance from council’s contracts team and procurement policy, and funding was allocated from Frankston City Council.

The project involved a number of stages to minimise disruption to staff, user groups and service delivery.

External resources

The following external resources were utilised:

- Education – Balance3: Leigh Baker from Balance3 was utilised to undertake capacity building via a sustainability for business workshop
- Programmed Maintenance: Frankston City Council’s maintenance contractor was engaged to assist temporary heating and heater decommissioning in the Annex
- Ironbark Consulting: Initial audit, recommendations, costings and predicted energy savings. Additional HVAC advice and consulting.
- Magazine Art: Energy data monitoring and follow up audits
- Easternway Constructions: Insulation and skylights

Challenges and solutions

The project had very few challenges. The key challenge with the technology was the push button control compatibility. The initial Daikin controls had to be replaced after a number of attempts to get them working with the HVAC system. The other challenge with the technology is the split system in the Annex that was programmed to two hours, which users tried to override, causing a system malfunction. Consequently, the control was reprogrammed to a half hour operating time rather than two hours.

Implementation challenges affecting timing were faced due to other roofing works delaying the HVAC installation. This set the project back by a couple of weeks.

Gaining energy data has been a challenge due to the change in management of the facility, as the United Energy ‘Energy Easy’ portal changed from the centre management to Frankston City Council, and access has not yet been granted to the new portal due to AGL not responding to United Energy’s information request. Six weeks of interval data has been obtained from AGL, however this is not ideal to adequately analyse changes in trends of electricity usage over time.
Ongoing benefits

Beyond the funding period, the ongoing benefits include:

- Staff and user group induction and building operation guide - ongoing use
- Community benefit from capacity building of community members to reduce their personal household financial impacts from electricity prices
- Building tours of energy efficiency as a part of the Sustainable Homes Program, inspiring community members to think about their own energy use
- Cost savings in utility costs - impacting less on the Centre’s service delivery and operating hours
- Staff and user group comfort and wellbeing - particularly elderly groups that are impacted by heatwaves and the cold when the HVAC system fails
- Capacity building of Facility Managers - learning about and understanding energy efficient technologies and changing their approach and perception
- Showcase of passive design retrofits - case study that can be adopted by householders, other community centres and businesses, schools etc.
- Reduced carbon emissions.

As previously described, long term energy and operational savings will be realised over time.

CONCLUSION

The Community Energy Efficiency Program enabled the Frankston North Community Centre to reduce operational demands of high electricity and maintenance costs from inefficient equipment, for the betterment of services to the community.

To date, almost 400 residents have been engaged with in energy saving activities and skills transfer that they can utilise at home.

Whilst heating demand is still high, summer use of the building is considerably improved, with the air conditioning rarely being required over the recent summer period. Many of the energy savings are already being realised, and the HVAC maintenance savings are evident.

The total project budget was $267,743, with the actual cost $272,506 ($4,763 over budget). Of this, the Australian Government contributed $177,566, Frankston City Council contributed $94,940.90, however received a reimbursement of $488 from Energy Makeovers to complete the works to the ceiling radiator removals, and $1,134 in VEECS generated from the project activities.

The internal project management was effective and the project ran relatively smoothly with the only technical errors occurring with the push button controls, which have since been rectified. The project identified further opportunities to improve the HVAC efficiency, and the post implementation audit identified further draft proofing measures required. These will be investigated in the next financial year.

Overall, the project has been successful in terms of engaging with around 400 community members on energy efficiency. Whilst the projected energy savings have not been fully realised for the centre, the energy usage has effectively been reduced to date by 24% (equating to a 12,555 kWh reduction), with a total energy cost saving of $2,742 per annum, in addition to the $26,000 per annum in HVAC maintenance. Further work by Council, including the installation of a solar PV system and monitoring the energy demand of the site over time, will increase the savings and benefits to the centre and the local community.
DECLARATION

The Authorised Officer of the organisation makes the following declarations:

☐ I declare that I am authorised to submit this Final Report (including any attachments) on behalf of

[Signature] (Name of organisation)

☐ I declare that the information provided in this Final Report is true and accurate.

☐ I understand, and acknowledge that giving false or misleading information in this Final Report is an offence under the

Criminal Code Act 1995

☐ I understand that final payment will only be made in accordance with the Funding Agreement including on satisfactory completion of Milestones.

Authorised Officer Signature: [Signature] Date: 19/5/15

Name: Craig Omsdale

Position: Manager - Sustainable Assets

Organisation: Frankston City Council

Witness Signature: [Signature] Date: 19/5/15

Name: Rachel Weaver

Position: Resource Efficiency Coordinator

Organisation: Frankston City Council

The use and disclosure of information provided in this Final Report is regulated by the relevant provisions and penalties of the Public Service Act 1999, the Privacy Act 1988, the Freedom of Information Act 1982, the Crimes Act 1914 and the general laws of the Commonwealth of Australia.

Information contained in the Final Report may be disclosed by the Department for purposes such as promoting the program and reporting on its operation and policy development. This information may also be used in answering questions in Parliament and its committees. In addition, the selected project information will be made publicly available. Public announcements may include the name of the grant recipient and of any project partners; title and description of the project and its outcomes; and amount of funding awarded.
## ATTACHMENTS

### Attachment A: Project Energy Efficiency Improvement Template

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<thead>
<tr>
<th>PROJECT TITLE</th>
<th>Mahogany Neighbourhood Centre Community Energy Efficiency Upgrade</th>
<th>PROJECT ID</th>
<th>CEEP2145</th>
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<td>Mahogany Neighbourhood Centre</td>
<td>DATE</td>
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**Building, Facility or Site 1**

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<tr>
<th>Name of Building, Facility or Site 1</th>
<th>Frankston North Community Centre</th>
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<tr>
<td>Location (address)</td>
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<tr>
<td>Type of building, facility or site</td>
<td>Community Centre</td>
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<tr>
<td>Activity Type and Measure</td>
<td>Upgrade of HVAC system, Energy Efficiency retrofits</td>
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**Energy Efficiency Estimate Method**

The original energy baseline analysis was taken from the energy audit conducted by Ironbark Sustainability in January 2013. The baselines were revised when more detailed information became available. Data has been derived from actual billing data. Square meters has been used to provide an efficiency indicator as no NABERS rating is available for this type of facility.

**Baseline Energy Usage**

53,278 kWh (191,803 MJ) per annum

**Baseline Energy Efficiency**

172 MJ/m²

**Energy Efficiency Improvement**

Actual annualised energy reduction is 12,555 kWh/year (45,198 MJ), based on:

53,278 kWh/year (191,803 MJ) - 40,723 kWh/year (146,603 MJ) = 12,555 kWh/year (45,198 MJ).

Original baseline: 172 MJ/m²/year. New baseline: 121 MJ/m²/year

Reduction of 51 MJ/m² in 2014-15, an estimated decrease of 30%

**Reporting Data (Measuring Energy Efficiency and Additional Data)**

The original total area of the centre was 1,115m² and 40 occupants, which was used for calculating the potential savings. Due to the redevelopment of the centre, the new floor area is now 1210m²

85 per cent average operational occupancy level

Daily hours of operation: 9am to 5pm

**Cost of Activity**

$272,506.90

**Estimated Cost Savings**

$2,742 per annum

---

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### Attachment B: Projected Savings (original audit)

#### Ironbark

<table>
<thead>
<tr>
<th>Description</th>
<th>Total annual elec savings (kWh)</th>
<th>Annual maintenance savings ($)</th>
<th>Maximum Demand Savings (KW)</th>
<th>Total annual cost savings ($)</th>
<th>Cost of measure ($)</th>
<th>Annual GHG saved (tonnes CO2-e)</th>
<th>Simple payback (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install Solar Hot Water with Gas Booster</td>
<td>3,069</td>
<td>$ -</td>
<td>-</td>
<td>$ 859</td>
<td>$ 6,000</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Install Ceiling Insulation</td>
<td>6,047</td>
<td>$ -</td>
<td>-</td>
<td>$ 1,693</td>
<td>$ 17,000</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Install Fixed Horizontal Louvres</td>
<td>1,747</td>
<td>$ -</td>
<td>-</td>
<td>$ 489</td>
<td>$ 1,500</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Install Removable Shadecloth</td>
<td>936</td>
<td>$ -</td>
<td>-</td>
<td>$ 262</td>
<td>$ 375</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Install Magneteite on External Windows</td>
<td>2,077</td>
<td>$ -</td>
<td>-</td>
<td>$ 582</td>
<td>$ 55,250</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Upgrade HVAC Systems</td>
<td>9,350</td>
<td>$ -</td>
<td>-</td>
<td>$ 2,618</td>
<td>$ 116,000</td>
<td>-</td>
<td>13</td>
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<tr>
<td>Replace Electric Bar Heaters with Energy Efficient Split Systems</td>
<td>853</td>
<td>$ -</td>
<td>4.1</td>
<td>$ 1,194</td>
<td>$ 1,912</td>
<td>-</td>
<td>1</td>
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<tr>
<td>Install Ceiling Fans</td>
<td>3,187</td>
<td>$ -</td>
<td>-</td>
<td>$ 892</td>
<td>$ 7,650</td>
<td>-</td>
<td>4</td>
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<tr>
<td>Replace Standard EXIT Sign with LED Exit Sign</td>
<td>1,730</td>
<td>$ 285</td>
<td>0.2</td>
<td>$ 769</td>
<td>$ 3,630</td>
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<td>2</td>
</tr>
<tr>
<td>Install PE Cell</td>
<td>573</td>
<td>$ -</td>
<td>-</td>
<td>$ 161</td>
<td>$ 312</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Replace T8 Fluorescent Tubes with 19W LED Tubes</td>
<td>2,364</td>
<td>$ 28</td>
<td>2.0</td>
<td>$ 690</td>
<td>$ 5,510</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Delamp</td>
<td>57</td>
<td>$ -</td>
<td>0.1</td>
<td>$ 16</td>
<td>$ 40</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Install 'Smart' PE Cell and Motion Sensors Control of Security Lights</td>
<td>758</td>
<td>$ -</td>
<td>-</td>
<td>$ 212</td>
<td>$ 820</td>
<td>-</td>
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<tr>
<td>Replace Recessed 26W CFLs Double with 30W LED and New Fittings</td>
<td>1,092</td>
<td>-$ 87</td>
<td>0.9</td>
<td>$ 219</td>
<td>$ 5,440</td>
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<tr>
<td>Install Valvecosy on Hot Water System Pressure Temperature Relief Valve</td>
<td>165</td>
<td>$ -</td>
<td>-</td>
<td>$ 46</td>
<td>$ 90</td>
<td>-</td>
<td>0</td>
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<tr>
<td>Remove Fridge / Freezer</td>
<td>376</td>
<td>$ -</td>
<td>0.4</td>
<td>$ 105</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Upgrade Fridges to Energy Efficient Models</td>
<td>651</td>
<td>$ -</td>
<td>0.7</td>
<td>$ 182</td>
<td>$ 1,300</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>CEEP TOTALS</strong></td>
<td><strong>35,031</strong></td>
<td><strong>$ 226</strong></td>
<td>8.4</td>
<td><strong>$ 10,990</strong></td>
<td><strong>$ 222,829</strong></td>
<td><strong>47</strong></td>
<td><strong>20</strong></td>
</tr>
<tr>
<td>Install Photovoltaic Array</td>
<td>19,320</td>
<td>$ -</td>
<td>-</td>
<td>$ 5,260</td>
<td>$ 31,200</td>
<td>-</td>
<td>26</td>
</tr>
<tr>
<td><strong>GRAND TOTALS</strong></td>
<td><strong>54,351</strong></td>
<td><strong>$ 226</strong></td>
<td>8.4</td>
<td><strong>$ 16,249</strong></td>
<td><strong>$ 254,029</strong></td>
<td><strong>73</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

Table 2: Compiled financial and environmental implications of actions

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