Case Study:

Adamstown - First 'Sustainable Living Energy Project' for the Institute of the Sisters of Mercy of Australia and Papua New Guinea

November 2017

ISMAPNG Objectives

- Energy
- Infrastructure

ISMAPNG Goal

- Reduce energy costs
- Reduce carbon dioxide emissions

Progress Achieved

Reporting for the solar installation is still being reviewed to allow for accurate and timely reporting. Measures for the month of November 2017 include:-

- Environmental benefit – 4,788.5 kWh produced with estimated carbon savings of 4,022 kilos
- Financial benefits – estimated savings of $1,434.00
- Other quantitative results – the system is currently exceeding the energy production target expected by 16%

The Issue

In 2016 the property team was asked to investigate the possibility of utilizing solar for the properties of the Institute. Following a full review of available possibilities, a Power Purchasing Agreement (PPA) was identified to be the most beneficial model moving forward. The PPA required no "up front" financial outlay and the savings would be achieved through decreased energy charges by utilizing solar. After a 10-year financing agreement, the equipment would be fully owned by the Institute.

Showing increasing support for this venture, in November 2016, the sisters launched their Sustainable Living policy which identified a number of objectives of focus that included energy as key area of interest

Sustainability Strategy Implemented

Following a number of meetings, it was decided to appoint an external aggregator to oversee the engagement of

leading service providers, project managers, suppliers, local sub contractors and manufacturers; to deliver complete solutions for solar PVC, LED lighting and eventually Green energy.

Implementation Process

Given that there were a number of issues that required rectification separate to the solar change over, it was deemed necessary to relocate the Sisters from the site. This served to ensure their safety as there were multiple contractors on the roof working on different parts of the overall scope of works. This is not the intention for any future solar projects.

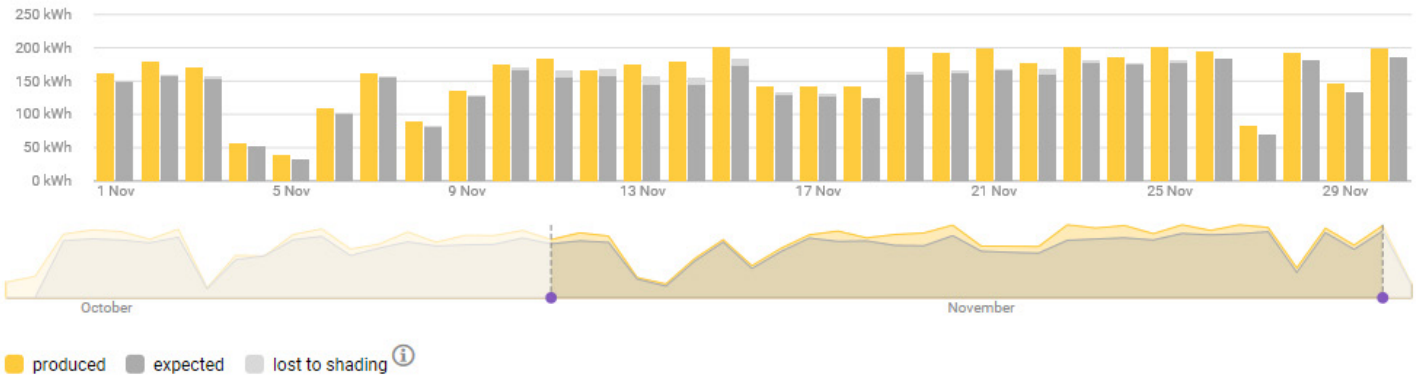
The review of the interval energy data for the Adamstown site identified that a 26 KW system would be required to meet the energy needs of the Sisters living on site. This necessitated the installation of 113 panels on a number of the roofs of the separate stand alone buildings. The system has been installed as a micro grid where all of the panels are joined and metered at a central point that allows for further savings through reduced metering charges. There were difficulties in trying to coordinate the roofing issues, the old hot water system removal and new replacements as well as approvals required from the Energy Distributor to connect the solar system to the grid. Each of these complications contributed to a completion date 3 weeks after the official launch.

LED lighting was also installed in all of the Sisters units and Sisters have been very pleased with their brighter and more energy efficient lighting.

The official launch was held at the Adamstown site on the 31st August. A video of the launch of the day can be found here.

Tracking Progress

In line with the guiding principles within the Sustainable Living policy, it is intended that ISMAPNG will measure and monitor the initiatives that are implemented against all of the objectives. Tracking for the Adamstown site is being measured through Solar Analytics. Further reporting in regards to carbon savings is still to be developed. The Grey bars in the below graph highlight how the expected energy production, which is based on daily weather and historical sunlight hours available, has been improved upon every day with the yellow bar that records the actual energy produced. It is expected that improved reporting capabilities will be developed over time to be able to portray a comprehensive overview of energy produced, dollars saved, and carbon reduction.



Challenges and lessons learned

The Adamstown site was selected for the first solar project as there were a number of other issues that required resolution. It therefore made sense to address these issues at the same time as installing solar due to the scaffolding that was required to conduct this large scope of work. The roof required a great deal of rectifications and the existing solar hot water systems required replacing. The solar project would allow for all of these issues to be addressed at the same time.

A launch date was agreed between ISMAPNG and the aggregator that was a shorter timeframe than what is usually required for a project of this size; which resulted in a number of issues that need to be resolved prior to any future projects. An example being during the additional plumbing works and connections for the new hot water systems; it was identified that PHASE 3 power was required after installation works had already commenced. There were also issues with weather delays, contractor availability, and works required to link bottom and top floor units to the micro grid.

At the end of the project, issues identified and solutions for these issues were identified in conjunction with the external aggregator:

- Agreed project roll-out plan stages compressed to meet target date, which caused an unrealistic timeframe for complex micro grid implementation.
    - In future projects must adhere to agreed project roll-out plan stages and timing.
- Delayed procurement of necessary equipment due to late sign off of finance contract.
    - Obtain credit approval for each project prior to work commencement.
- Delay in commissioning of system due to unrealistic timeframe.
    - Ensure Distributor Application is lodged and approved prior to installation team arriving onsite.
- Requirement for 3 phase power upgrade to install desired option due to incomplete project scope.
    - Adhere to agreed project roll-out plan stages and timing.

Financing options

The intention of the solar and LED roll out was for it to be funded through a PPA that did not require any up front capital costs. The model has ISMAPNG agreeing to “buy” its energy off a financing company for 10 years at a rate less than the current retail rate for the hours that solar is operating. Any solar produced during the day will be utilized by the Sisters living in the residence and any excess electricity will be exported back to the energy grid with a rebate (state based) credited to the retailer electricity invoice. The energy use outside of the solar production time will still be purchased from the current retailer at the current higher energy rates.

It was identified during this process that the LED lighting upgrades could not be incorporated into the PPA and this did incur an additional cost. It will now “pay back” over reduced energy use (LED’s are up to 50% more energy efficient) and also from the ongoing savings through the lower rates now being charged for all of the day time energy use.

There were also other costs for this initiative as the roof rectification and hot water replacement costs were issues that required resolution as part of normal property maintenance. They are not part of the costs that would be associated with a standard solar installation.

Next Steps

Since this project has been completed, a number of lessons learned (as highlighted above), along with a change in the available property mix available for future projects, has caused this current PPA agreement to be deemed

inappropriate for the majority of the smaller residential sites. The original model required a number of larger properties to be included so that the smaller residential properties could be added; ensuring that an appropriate energy load could be included to meet the energy hurdle rates of the finance company.

Identifying options for alternative funding solutions, and clarity around the properties that will be included, now requires further investigation given the intention of the Sisters is to continue with the plan to utilize solar energy and LED lighting, as well as investigating green energy options.

Demographic information

The Institute of Sisters of Mercy of Australia and Papua New Guinea (ISMAPNG) is a community of Catholic Religious Sisters in Australia, Papua New Guinea and further abroad. Whatever and whenever our ministry is, we are part of the one Mercy mission, part of the ongoing mission of the compassionate Jesus. In furthering our charism, we partner with thousands women and men as employees, associates and volunteers. Together we have a proud and continuing history of serving people suffering from injustices related to poverty, sickness or lack of education.

- 15,000+ people
- 750+ Sisters of mercy
- 134 Institute staff members
- 11,000 ministry partners
- 3,000+ ministry volunteers
- 350 Mercy associates
- 32 Young Mercy links
- Assisting 210,000 persons annually

Links

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Quotes:

Pauline Murray rsm –"The LED lights, especially in my kitchen are great"
Maureen Torphey rsm – "Exciting to be part of such a great venture!"

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