



Townsville City Council QLD

Level 2 Energy Audit and Energy Management Plan

Project Overview

Conservia conducted a Level 2 Energy Audit (EA) for Townsville City Council in August 2019. The project covered 5 of the council's highest electricity consuming sites with a view to measure energy consumption, greenhouse gas impact and subsequently recommend Energy Conservation Measures (ECMs) based on the findings of the energy audit.



The Opportunity

A site visit was required to gather information to perform the study. The on-site assessment included reviewing building and equipment data, interviewing site personnel, observing energy related equipment operation and conducting comprehensive site measurements. Following the site visit, the energy assessment was developed into Phase 1 & Phase 2.

Phase 1 consisted of a utility bill audit which established a baseline for electricity consumption and electricity demand usage and facilities benchmarking using 12 months consumption data for electricity. This generated a baseline for the electricity usage that was later used in calculating potential energy savings. A Tariff Analysis and Power factor correction analysis were undertaken to calculate the financial savings for each facility. NABERS ratings were estimated for applicable buildings with a revised estimate based on the implementation of recommended ECMs delivered from the EA.

Phase 2 had the purpose of identifying and quantifying ECMs. A comprehensive list of ECMs was proposed with detailed payback estimations. A list of other significant findings regarding incentives, renewable energy sources, thermal storage or other operation and maintenance measures were also reported.

Project Objectives

Key project requirements were identified as:

1. Identify and quantify Energy Conservation Measures and make recommendations to reduce electricity usage.
2. Conduct a tariff analysis to select best tariff option for each site.
3. Benchmark the facility with NABERS rating and available benchmarks.



The Results

Identified ECMs were classified in several categories: air handlers, chilled water and air conditioning systems, exterior lighting, interior lighting, building controls, plumbing systems renewables and other. Total electricity savings of **1,426,000 kWh** was identified which is around **30%** of the total electricity consumption.

Key Energy & Water Conservation Measures (ECM's)

- Installation of PV systems sized on the facility electricity demand.
- Building Management System (BMS) upgrade and fine tuning to ensure optimum building control.
- Lighting upgrade – Replacement of T5 and T8 fluorescent fittings as well as metal halide high bays with LED fittings.
- Electrical metering and sub metering with demand limiting.
- Optimising operation of air handling units including the installation of variable speed drives, CO2 control and demand-based control via the BMS.
- Optimising chiller operation including chilled water temperature set point reset and condenser water temperature reset.
- Installation of solar films on windows.
- Optimising after hours HVAC operation.
- Integrated HVAC /Lighting control on VRF units via HLI to VRF units.
- Electric duct heaters control with solid state relays.
- Chiller replacements where existing units are close to end of life with phased out refrigerant R22.

Energy Savings

Energy Savings = 1,426,000 kWh per year.

The opportunities for savings were on-site solar PV generation, fine tuning and optimising existing BMS by incorporating unoccupied set points for select zones, implementing chilled water reset strategy, supply air pressure/temperature reset strategies in AHU's. Other ECMs included were LED lighting install replacing existing T8/T5 fluorescent fittings, metal halide high bays and integrated lighting and HVAC control with stand alone VRF/split AC units. Demand ventilation with CO2 sensors and solar films on windows too were also proposed. Tariff analysis were also performed and a cost reduction of \$11,000 was identified by changing to different tariff.

The existing and proposed annual energy usage and cost for this project are shown below.

The Benefits

When implemented, the ECMs will save over \$310,000 per year with an overall payback of 6.9 years. Total savings for electricity is 1,426,000kWh/yr which was 30% of the existing electricity consumption.

All values were evaluated using simulations and spreadsheet calculations based upon standard energy savings estimating methods and assumed operating conditions.

About Conservia

Conservia delivers guaranteed energy efficiency solutions. We take the time to understand our clients operations and develop solutions to help them achieve their energy, sustainability, and environmental goals. Our experts will audit and analyse precise energy consumption to make recommendations and deliver guaranteed energy saving solutions tailored to suit.

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