

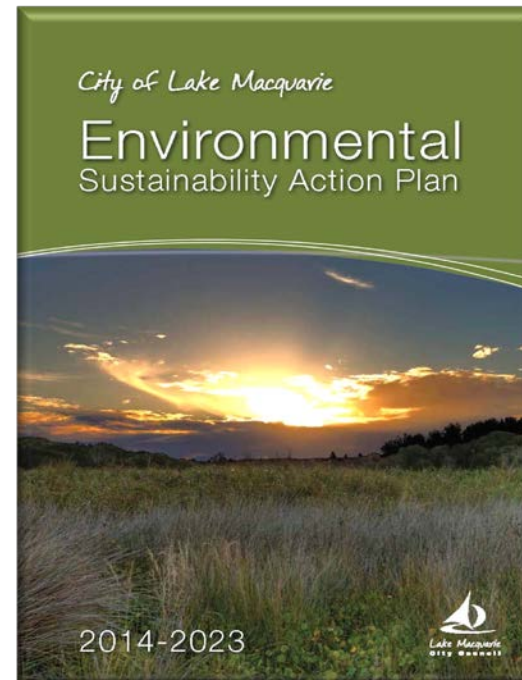


Lake Mac Smart City

Smart thinking around energy and water efficiency

Background

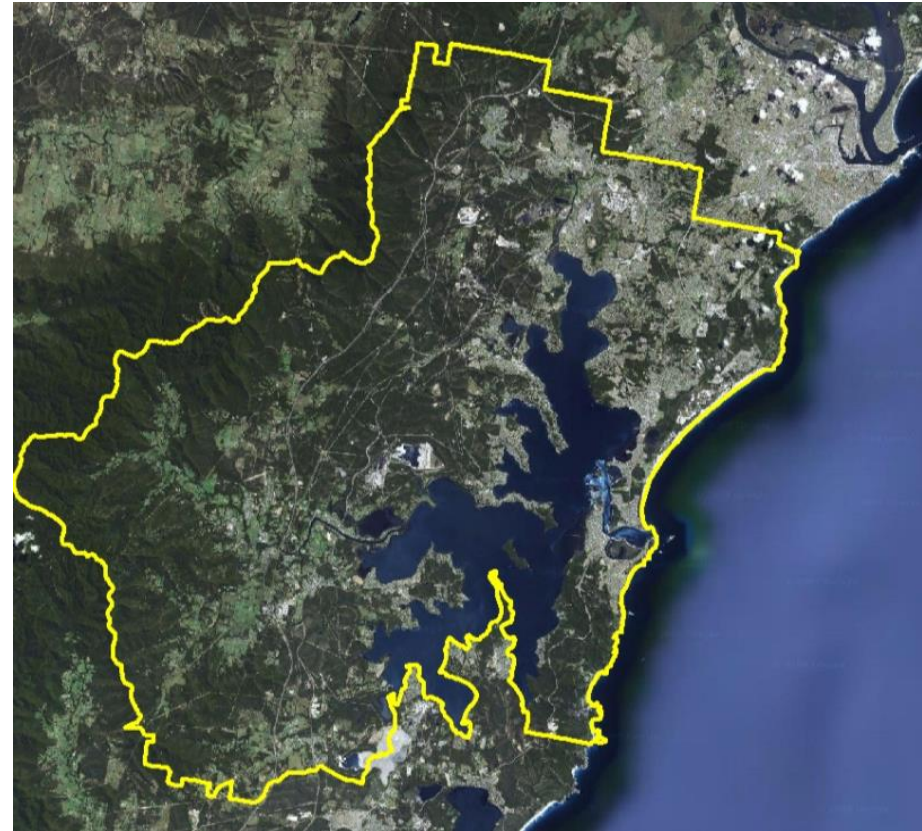
- In 2014, the Lake Macquarie City Council endorsed the Environmental Sustainability Action Plan (ESAP) 2014-2023
- Provides a framework for sustainability planning, decision-making and action to achieve improved environmental sustainability.
- Ensures delivery of sustainability related activities across all sections of Council



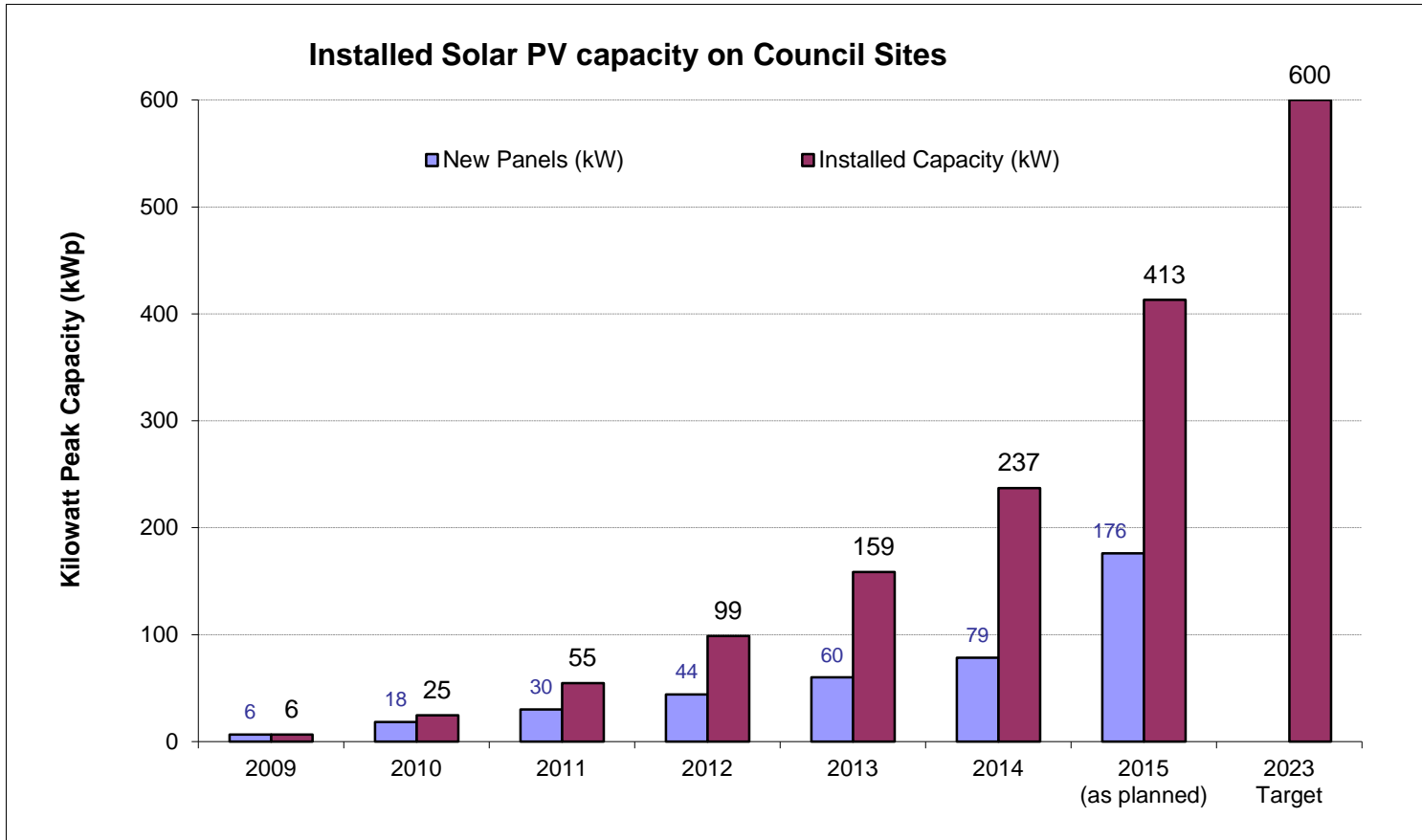
Background

ESAP includes a number of targets to achieve by 2023 from a baseline of 2007-08:

- 45% per capital reduction in City wide greenhouse gas emissions
- 600 kW of renewable energy generation capacity installed on Council facilities
- 12% reduction in potable water use from Council operations
- Increase in cycling and walking trips to 6% of total trips



Reducing Council's energy bills



Reducing Council's energy bills

- Solar panels on ten facilities
 - \$134,000, 645 tCO₂ per year
- Admin building energy management
 - LED lighting upgrades
 - BMS scheduling
 - \$50,000, -300 tCO₂ per year v 07/08
- Fleet emissions savings
 - \$350,000,- 670 tCO₂ per year v 07/08
- Pool covers
 - \$150,000,- 664 tCO₂ per year



Achievements - last 12 months

- Solar PV installs 2014/15
- 178 kW on Administration Building (estimated to save \$46,000, 260 tonnes CO2 annually)
- 78.5kW on the Depot Breezeway (\$28,500 annual savings, 123 tonnes CO2 saved)



Achievements - last 12 months

Water saving measures

- Irrigation upgrades on sports fields (\$29,477 annual savings and 10,790 kL saved)
- Smart metering, leak detection and rectification (\$25,600 one-off saving with 11,200 kL saved)



Achievements - last 12 months

Lake Macquarie City Art Gallery

- Implemented a state-of-the-art lighting system designed to achieve significant energy savings and enhance exhibition display conditions.
- This together with the 162 photovoltaic panels on the roof and the voltage reduction unit has placed the gallery high on the list of sustainable regional galleries in the country.
- **Lake Macquarie City Art Gallery Director, Debbie Abraham, said the new lighting system not only reduces energy consumption, it maximises colour reception and the audience's viewing experience.**



Background

Awards:

- Lake Macquarie City Council was the winner of the 2013/14 Local Sustainability Award as part of Local Government NSW's Excellence in the Environment Awards
- It recognised that sustainability is core business in Lake Macquarie



LED sports field lighting

Project Description:

- Auston Oval, Morisset

Rationale:

- Trial LED lighting at a small sports field due for refurbishment.
- Establish cost savings using dimming without affecting uniformity.
- Project Challenges: Additional upfront cost compared to metal halide
- Key project outcomes: Due for installation in November 2015.



Administration LED Lighting

- Project Description: Stage 1 LED Lighting Roll Out
- Rationale: Build on the successful trial of 102 LED lights to ensure all office lighting was compliant with the Australian Standard and saving energy.
- Project Challenges:
 - Staff adjustment period to the uniform colour temperature
 - Changes to the Energy Savings Scheme affecting product approvals announced after the contractor appointed.
- Key Project Outcomes:
 - 1664 lights replaced which are rated for 40,000+ hours
 - 90 MWh reduction in non-air-conditioning based energy consumption in the year since lighting upgrades were completed – Capacity reduction ~30kVA
 - 50% decrease in lighting electricity consumption
 - over 90 tonnes p.a of greenhouse gas emissions saved
 - over \$19,500 p.a at current electricity rates, resulting in a 4 year payback period



Administration Building carpark solar lighting installation



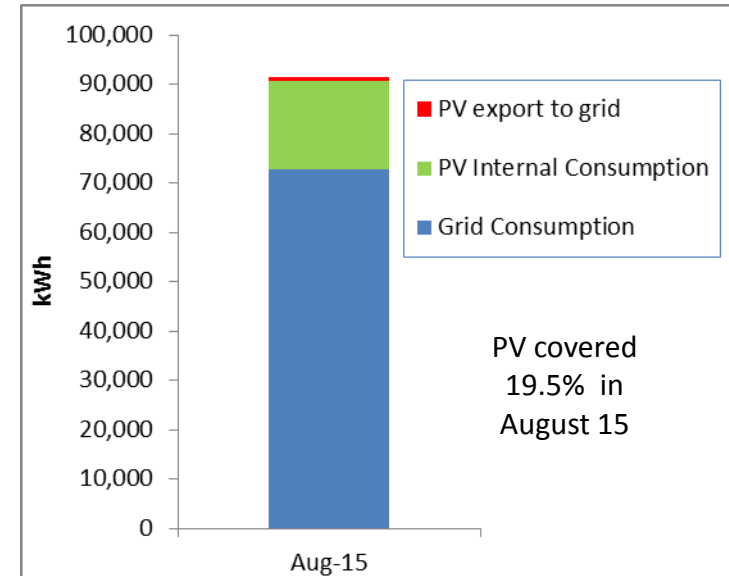
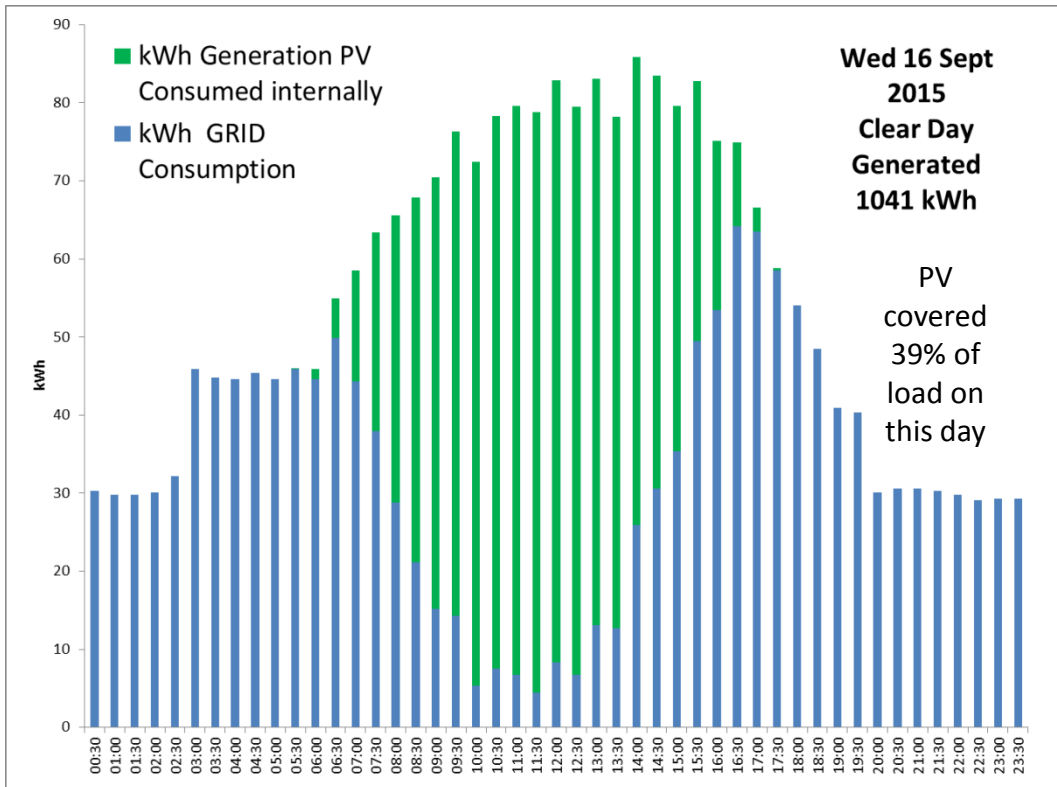
Solar power plant – Admin Building

- Project Description: 178kW PV
- Rationale: Building with internal load to accommodate large system
- Project Challenges:
 - Sizing the system in anticipation of HVAC upgrade that would alter internal load.
- Key project outcomes:
 - Excellent collaboration between Council departments and contractor
 - Estimated to save \$46,000 (including RECS) and 260 tonnes CO2 annually



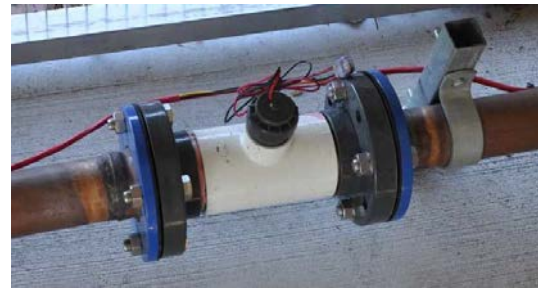
Solar power plant – Admin Building

- System monitored and performing well



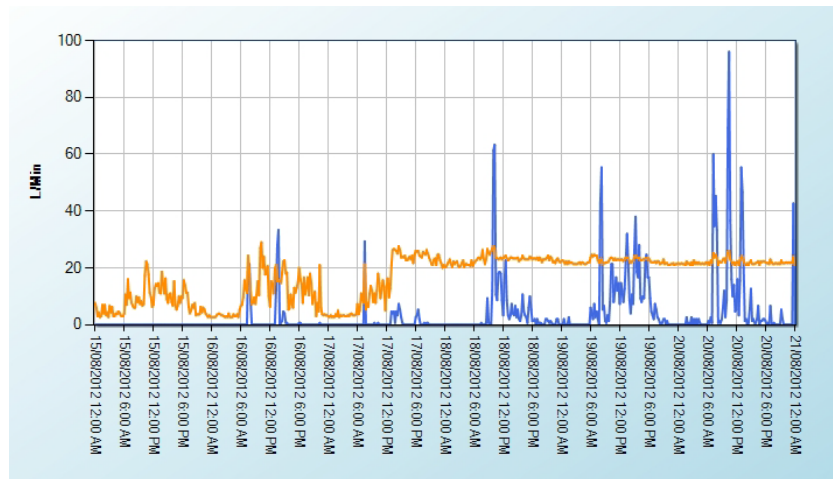
Central Irrigation Control System

- Consistency of controllers
- Improved operation and scheduling of irrigation
- Enhanced monitoring – resolve problems early
- Easier for field staff to do their job
- Sports field users reluctant to “lose control”



Smart water metering

- 34 permanent data loggers fitted to high risk sites
- Four mobile loggers – short term investigations
- Provide 15 minute interval data
- Swim centres, holiday parks, sports fields, an old RAAF air base, works depot, administration building
- Rapid detection of new leaks
- Estimated 65,300 kL of savings



Electric vehicle

- Two electrical vehicles in fleet
- Staff driver incentive program developed
- Working with external stakeholders to expand charge network

Mitsubishi iMiEV and
Nissan LEAF



Have your say
**Lake Mac
Smart City**



Further emission savings?

Continue to achieve a 3% pa reduction in Council's greenhouse gas emissions:

- Installing PV on up to four Council buildings including 20kW on Belmont Library in 2015/16
- Implementing the Better Buildings Strategy (Community Buildings) including energy efficiency measures on 17 community buildings in 2015/16
- Continue installing LED lighting in Council buildings



Reducing fleet emissions

Future measures to reduce emissions from the heavy fleet include:

- Conversion from Euro III to Euro IV and V emissions standard
- Reduction in garbage collection from weekly to fortnightly service in 2017
- Diversion of waste to closer receiving facilities

Future measures to reduce emissions from the vehicle fleet include:

- Annual review and selection of “best in class” passenger vehicles



Further water savings?

- Continue to implement water saving measures to meet a 12% reduction in potable water use from Council operations by 2023
- 2015-16 projects
 - New, highly efficient automatic irrigation systems at five sports fields
 - Soil amendment works (compost trial) at eight sites
 - Refine operation of weather based irrigation
 - Further expand the smart metering network



Questions?

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