



Ausgrid

The Experience with the Deployment of 30,000 LED's

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Agenda

- Overview of Ausgrid
 - Ausgrid's Distribution Business
 - Ausgrid's Street Lighting Business
- The Introduction of LEDs
- Where to from Here
- Plans for the future
- Opportunities for Smart Street lighting

Overview of Ausgrid

Ausgrid's Distribution Business

- On 1 December 2016, AustralianSuper and IFM Investors acquired a 99-year lease of 50.4 per cent of Ausgrid. Remainder rests with NSW Government.
- Ausgrid's main business is the distribution of electricity throughout our Network area.
- Over 1.71 million customers.
- Over 25,000GWh energy distributed each year.
- Peak demand of 5,488MW



Overview of Ausgrid

Ausgrid's Street Lighting Business

- Ausgrid's street lighting business is regulated by Australian Energy Regulator (AER).
- Ausgrid manages over 250,000 street lights across our network.
- Our customers are 41 councils (now 33 with amalgamations), RMS and small customers. (93 customers in total)
- Around 70% of our street lights are on residential roads, 30% on main roads.

Overview of Ausgrid

Ausgrid's Street Lighting Business

- Each year we responded to over 22,000 customer reported street lighting outages.
- How do customers report faulty street lights?
- <https://www.ausgrid.com.au/streetlight>

Ausgrid Safety Customer services Industry About us Search

Home > Customer services > In your neighbourhood > Report it > Report a streetlight fault

REPORT A STREETLIGHT FAULT

Any information you provide about your streetlight fault can help us fix the problem sooner. This is because crews make repairs in the day when all the lights are off. This includes the number of lights out or nearby landmarks and cross streets. Ausgrid only looks after streetlights in our network area, but not every streetlight in our area is maintained by us. If you can not find a streetlight on the map, you may need to contact the local council, the RMS for lights on bridges, or your local electricity network business.

This form is only for reporting faulty streetlights. Reports about lighting levels or glare should be directed to your local council.

[Click on the streetlight to make a report](#)

Location Search Pole number Search

Can't find the streetlight on the map? [Make a report here](#)

- Working**
We haven't received a report for this light.
- Reported**
Crews are working to repair this light.
- Ongoing repairs**
Repairs for this streetlight are complex and will take some time.
- Non-Ausgrid**
We don't look after this streetlight. Please contact Council or RMS.

If you have difficulties using this form, please call us on **1800 044 808** between 8am-6pm Monday to Friday. [See how we repair streetlights](#)

Overview of Ausgrid

Ausgrid's Street Lighting Business

- Since September 2013, LED street lights have been Ausgrid's default luminaire for residential roads.
- So far Ausgrid has installed over 30,000 LED luminaires in residential roads.
- We plan to start installing main road LEDs over the next few weeks.

The Introduction of LEDs

Sourcing appropriate LED Technology

- Sought quotations to trial LED street lights at the end of 2010.
- Following responses from 30 companies world wide, we awarded 3 contracts for LED luminaires in early 2011.
 - LED Roadway Lighting (SAT-24S at 22-28W),
 - OrangeTek (TerraLED 48 at 50W) and
 - Sylvania StreetLED at 29W.



LED Roadway Lighting SAT-24S



OrangeTeK TerraLED 48



Sylvania Street LED

The Introduction of LEDs

LED Trial

- The purpose of the trial was to determine the following:
 - Suitability of the construction of the LED luminaires for use on the Ausgrid network.
 - Visual impact and any glare issues.
 - Council and resident reactions to the new type of lighting.

The Introduction of LEDs

Implementation of the LED Trial

- Invited our customers (41 Councils) to participate in the trial.
- 8 sites were selected with the trial consisting of 64 LEDs.
- Information regarding LED technology and surveys were sent to over 1,000 customers in the selected streets before and after the new LED street lights were installed.
- Trial LEDs were installed in February 2012.

The Introduction of LEDs

Implementation of the LED Trial

- At each of the 8 sites we held an information night for Councils in the surrounding area.
- We invited the company whose LED was installed at the site to speak about their luminaire and their experiences to date.
- It provided an opportunity for our customers to see first hand LEDs in operation and ask any questions or raise concerns they had.

The Introduction of LEDs

Key Results from the Survey and Trial

- The majority of residents preferred the LEDs to the previous lighting (generally tubular fluorescent and mercury vapour).
- Residents did not find the LEDs to be any brighter or glarier than the previous lighting.
- Residents prefer higher lighting levels than the minimum levels allowed for under AS/NZS 1158 P5.

The Introduction of LEDs

Key Results from the Survey and Trial

- Photometric surveys substantiated LED performance claims and were generally consistent with photometric modelling.
- All LED trial sites and technologies showed marked improvements in both uniformity of lighting and the length of roadway that is effectively lit as compared with the previous lighting.

Before and After Photos—Oak Drive, Georges Hall



Before and After Photos—Oak Drive, Georges Hall



Before and After Photos—Oak Drive, Georges Hall

Before



After



The Introduction of LEDs

Issues from the Trial

- First and foremost was the lack of an Australian Standard that acknowledges LED's as a source for street lighting for use in Australia.
- A proposal to Standards Australia was put forward in March 2012 to include LED technology.

The Introduction of LEDs

Issues from the Trial

- There have been very few issues or problems with the trial to date.
- One issue encountered was of mechanical nature in that a seal was allowing water into the streetlight. The manufacturer quickly rectified this and as a precaution replaced seals on all of their units.

The Introduction of LEDs

Trial Report

- A detailed report on the trial was prepared and provided to all our customers (Councils).
- A copy of the report was also placed on our web site for other interested parties to download.

<https://www.ausgrid.com.au>

The Introduction of LEDs

Next Steps

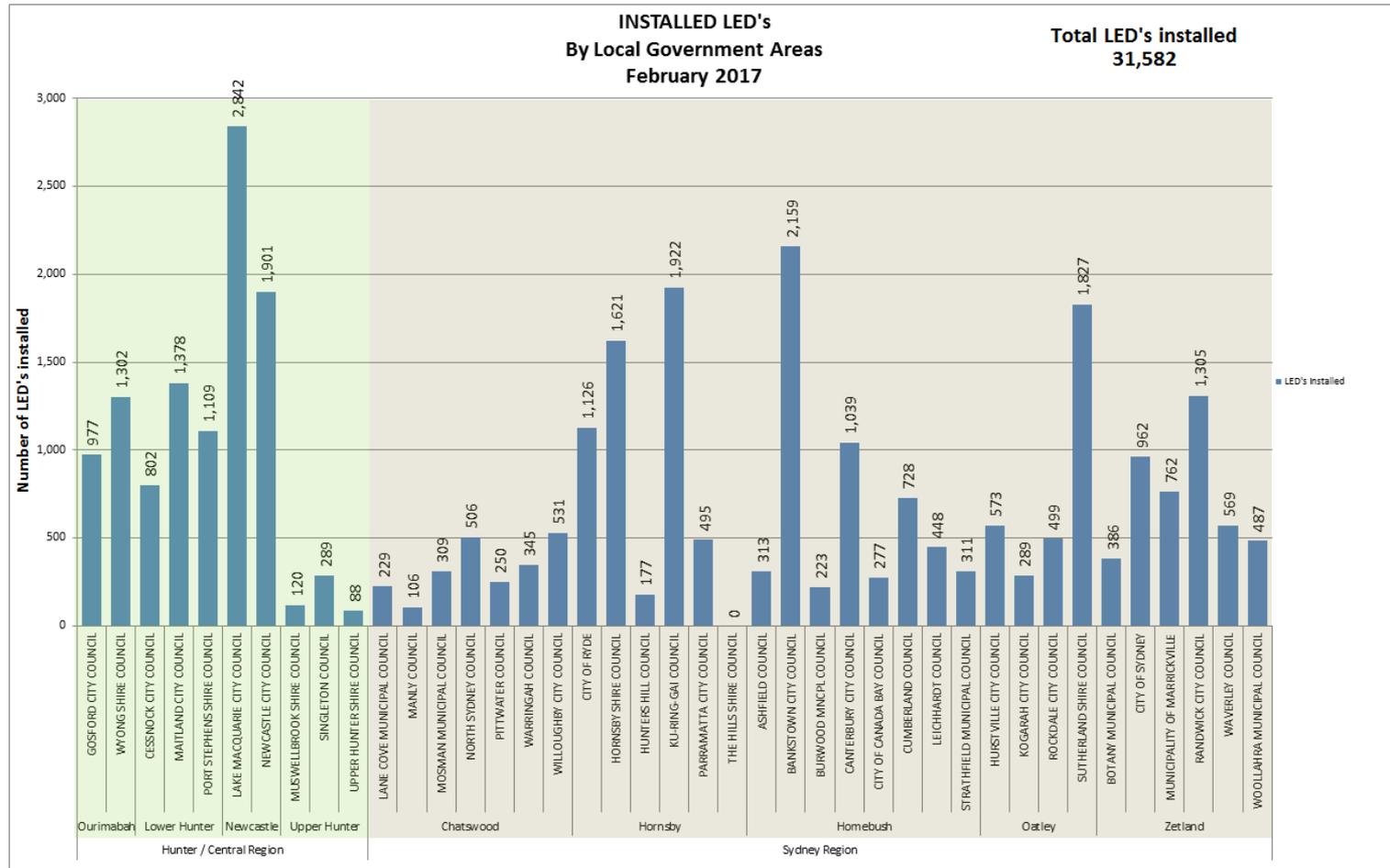
- Following the success of the trial, we sought prices to roll out around 10,000 luminaires per year from the 3 companies that were awarded the trial.
- The Sylvania StreetLED at 29W was selected.
- We consulted with the AER about our proposed LED pricing, and gained endorsement.

The Introduction of LEDs

Next Steps

- We sought agreement to introduce LED technology as our default for residential roads from our customers (Councils) and to agree to our proposed pricing.
- All 41 Councils agreed to the introduction of LEDs and our proposed pricing.
- LEDs for residential roads were introduced in September 2013.

The Introduction of LEDs



The Introduction of LEDs

Experience to Date

- Over 30,000 residential road LEDs installed.
- Some initial teething problems:
 - Mechanical issues with mounting plate
 - Water ingress issues
- The manufacturer quickly rectified this and replaced all the units at no cost to Ausgrid.
- No failures of light engine (LED module) to date.
- Some power supply failures.

Where To From Here

Tender Process

- Plan was to tender for large scale deployment of residential road LEDs and obtain a more competitive price which could then be passed on to our customers.
- In 2013 we did not believe main road LEDs were at a price that was sustainable for both us and our customers.

Where To From Here

Tender Process

- At the time Ausgrid was a fully government owned company and the 3 NSW distributors came under the umbrella of Networks New South Wales.
- Unfortunately the tender was delayed until 2015.
- In 2016 the tender was awarded.

Where To From Here

Next Step: Negotiate Pricing Structure for Customers

- We consulted with the AER regarding pricing
 - As we are in between periods, there was a need to negotiate a price with all 41 Councils for each of the new 16 LEDs.

Where To From Here

Current Way Pricing is Determined

- Capital charge for the luminaire is based on pricing over 20 years (average life of the luminaire).
- Maintenance charge is based on lamp failure, bulk lamp replacement cycles, photo cell replacement and other known failures.

Where To From Here

Can we use Traditional Price Modelling for LEDs?

- Traditional Luminaire
 - Luminaire housing
 - Power Supply (Ballast)
 - Globe (Replaceable)
 - PE cell
- LED Luminaire
 - Luminaire housing
 - Electronic Power Supply
 - Light engine (LED module)
 - PE cell

Where To From Here

Can we use Traditional Price Modelling for LEDs?

Capital	Maintenance
<ul style="list-style-type: none">• Capital cost of luminaire• Labour/time to install• Use of plant (EWP costs)• Overheads• Expected failure rate over 20 year period. Failures that involve complete luminaire replacement.• Annuity calculation over 20 year period adjusted annually for CPI• Fundamental change in that failures leading to luminaire replacement are captured in capital charge	<ul style="list-style-type: none">• Planned maintenance<ul style="list-style-type: none">• BLR - LED visited every second BLR cycle (6 years) for wipe and PE cell replacement• Night patrols• Unplanned maintenance<ul style="list-style-type: none">• Failure modes other than LED driver/module failures e.g. PE cell, fuse, wiring, etc.• Failures other than lamps account for more than 50% of faults

Where To From Here

Can we use Traditional Price Modelling for LEDs?

- Due to concerns and lack of real life experience of LED power supplies after 15 years, the capital charge incorporated a higher failure rate between 15- 20 years.

Luminaire	Capital Charge	Maintenance Charge	Total Charge
P4/P5 17W LED	\$36.12	\$32.57	\$68.69

Where To From Here

Can we use Traditional Price Modelling for LEDs?

- Feedback from Customers was can we reduce the capital payback period (less than 15 years) thereby eliminating the higher failure risk after 15 years.

Where To From Here

New Price Options for LEDs

- **Option 1 – Councils bear the risk / benefit**
 - Based on recovery of the installation and materials cost only.
 - There is no premium built into the price to account for failures beyond those covered by the supplier's warranty.
 - In the event of a failure, the value of the supplier's warranty (3 years labour, 10 years parts) would be passed through to council by either credit or replacement of materials.
 - Available for 10, 12 or 14 year capital payback period.

Where To From Here

New Price Options for LEDs

- **Option 2 – Ausgrid bears the risk / benefit**
 - Under this option councils are not impacted by lighting failure rates. Pricing for this option incorporates a premium on top of Option 1's price to account for failures not covered by the supplier's warranty.
 - The price premiums for this full warranty service vary depending on the chosen capital payback period and are listed below:
 - 10 year capital payback period – 5% per annum increase.
 - 12 year capital payback period – 7.5% per annum increase.
 - 14 year capital payback period – 15% per annum increase.

Where To From Here

New Price Options for LEDs

- **Option 3 – Ausgrid & Councils share the risk/benefit**
 - Under this option councils will have a stable cost and will not be impacted by lighting failure rates in the first 10 years.
 - Payments will extend beyond the capital payback period where and only where a failure has occurred in the first 10 years.
 - Price premiums for this service vary depending on the chosen capital payback period and are listed below:
 - 10 year capital payback period – 3% per annum price increase.
 - 12 year capital payback period – 4.5% per annum price increase.
 - 14 year capital payback period – 9% per annum price increase.

Where To From Here

New Price Options for LEDs

Luminaire	Capital Charge 20 years	Capital Charge Option 1 10 years	Capital Charge Option 2 10 years	Capital Charge Option 3 10 years
P4/P5 17W LED	\$36.12	\$54.15	\$56.86	\$55.77

Luminaire	Capital Charge 20 years	Capital Charge Option 1 14 years	Capital Charge Option 2 14 years	Capital Charge Option 3 14 years
P4/P5 17W LED	\$36.12	\$42.07	\$48.38	\$45.86

Where To From Here

New Price Options for LEDs

- **We gave the choice to our customers**
 - The customers chose Option 2 with a payback period of 10 years.

Plans for the Future

Main Road LEDs and Smart Controls

- Currently seeking trial sites for main road LEDs coupled with smart controls.
- Plan to go back to the market place in July 2017 seeking competitively priced compliant luminaires for large scale accelerated replacement of main road luminaires.

Plans for the Future

Potential Replacement Programs

Main Roads

- 16,000 - 250 Mercury Luminaries
- 6,000 - 400 Mercury Luminaries

Residential Roads

- 12,000 - Twin 20 Luminaires
- 65,000 - 80W Mercury Luminaries

Opportunities for Smart Street lighting

Thoughts on Smart Controls

- Instant feedback on street lighting outages.
 - Could lead to efficiency gains in maintenance
 - Improved asset management for Ausgrid and customers
- Smart Controlling
 - Smart metering
 - Dimming - Potential energy savings for customers
 - Precise turn on/off
 - Incident management – increasing light levels, flashing
 - Additional Sensors (traffic monitoring, pedestrian activity, parking availability, weather and pollution)

Opportunities for Smart Street lighting

Thoughts on Smart Controls

- Smart street lighting systems
 - What system best suits both our needs and our customers needs.
 - Future proofing as a system.
 - Initial and ongoing costs (CAPEX and OPEX).
 - Key benefits.
 - Quantify the key benefits.
 - Payback period.
- Consult with our customers (What are they willing to pay!)
 - Needs and preferences for sensors e.g. parking, traffic information.

Questions?
