

Attachment 8.06 STAKEHOLDER ENGAGEMENT AND CUSTOMER CONSULTATIONS

May 14



STAKEHOLDER ENGAGEMENT AND CUSTOMER CONSULTATIONS

1.0	BACKGROUND	3
2.0	TECHNICAL WORKING GROUP	3 3 3 4 4 4 4 4
	2.3.8 Street Lighting Technical Working Group No. 9	
	2.3.9 Street Lighting Technical Working Group No. 10	
3.0	2.4 LED Consultation Meeting	
	3.1 Background3.2 Reports	
4.0	NEW APPROACHES TO 2014-2019 STREETLIGHTING PRICING	7
5.0	STAKEHOLDER ENGAGEMENT REPORT	8

Document and Amendment History

Issue No.	Date	Approved By	Summary of Changes
1.0	April 2014	Reg Team	Final
2.0	May 2014	John Bedding	Final with formatting

1.0 Background

This document provides details about how we have engaged and consulted with our customers during the regulatory period. Ausgrid is committed to consulting with it's stakeholders in the streetlighting business to ensure our customers are kept up to date about new initiatives and changes in the street lighting space.

Below lists the stake holder consultations that Ausgrid has initiated, these are our technical working groups, LED consultation meeting, LED Information Nights, 2015-19 Ausgrid Pricing approach meeting and engagement reports.

2.0 Technical Working Group

2.1 Purpose

The purpose of Ausgrid's (formally EnergyAustralia) street lighting technical working group was to discuss technical issues and practical issues that make a difference to lighting on streets and the maintenance of that lighting. The aim of this group is to establish on-going communication on technical matters between Ausgrid and its customers represented by SLIP. Ausgrid's relationship with its street lighting customers will be enhanced.

2.2 Scope

Ausgrid and SLIP technical representatives to meet on a regular basis to explore technical topics and issues in street lighting that are of common interest. Commercial topics and issues such as pricing and regulation are out of scope.

The working group will also endeavour to arrive at consensus on matters discussed and recommend to Ausgrid management and SLIP management the appropriate course of action.

2.3 Summary of meetings

Below is the list of meetings recorded with interested stakeholders discussing technical issues relating directly to street lighting. See Appendix A for copy of the agendas to these meetings.

2.3.1 Street Lighting Technical Working Group No. 2

Date: Tuesday 25 August 2009

Attendees: EnergyAustralia Representatives SLIP Council Representatives SLIP Consultant Agenda: Introduction to Australian Standards and invitation to join Standards Committee LG2 Accelerated replacement of 2/20s technical issues Cosmopolis LEDs Decorative luminaires Metal Halide lamps Off-peak dimming / monitoring

2.3.2 Street Lighting Technical Working Group No. 3

- Date: Thursday 19 November 2009
- Attendees: EnergyAustralia Representatives SLIP Council Representatives SLIP Consultant
- Agenda: Accelerated replacement of 2/20s technical issues Cosmopolis Metal Halide lamps LEDs Decorative luminaires Off-peak dimming / monitoring

2.3.3 Street Lighting Technical Working Group No. 4

Date:	Thursday 25 February 2010
Attendees:	EnergyAustralia Representatives SLIP Council Representatives SLIP Consultant
Agenda:	Accelerated replacement of 2/20s technical issues Cosmopolis Metal Halide lamps LEDs Decorative luminaires Off-peak dimming / monitoring Twin arc/long life sodium lamps

2.3.4 Street Lighting Technical Working Group No. 5

Date: Thursday 06 May 2010

Attendees: Ausgrid Representatives SLIP Council Representatives SLIP Consultant

Agenda: Accelerated replacement of 2/20s technical issues Cosmopolis LEDs Decorative luminaires Off-peak dimming / monitoring

2.3.5 Street Lighting Technical Working Group No. 6

- Date: Thursday 12 August 2010
- Attendees: Ausgrid Representatives

SLIP Council Representatives SLIP Consultant

Agenda: 32 CFL Luminaire Cosmopolis/Metal Halide Lamps LED Trial Decorative Luminaires Off-Peak Dimming AS/NZS Discontinuation of 125W Mercury Vapour

2.3.6 Street Lighting Technical Working Group No. 7

- Date: Tuesday 01 March 2011
- Attendees: Ausgrid Representatives SLIP Council Representatives SLIP Consultant
- Agenda: Accelerated replacement of 2/20s technical issues Proactive use of glare shields in narrow roads Cosmopolis/Metal Halide Lamps LEDs Decorative Luminaires Off-Peak Dimming/Monitoring AS/NZS Discontinuation of 125W Mercury Vapour NS119 Street Lighting Standard Updates Street Lighting Management Plan Update

2.3.7 Street Lighting Technical Working Group No. 8

- Date: Thursday 15 December 2011
- Attendees: Ausgrid Representatives SLIP Council Representatives SLIP Consultant
- Agenda: Decorative Luminaires 42W CFL Issues Cat P LED trial 125W MBF Replacement Main Roads: Active reactor update, PE cell update, remote monitoring Floodlighting Maintenance Update Aero screen up cast (brackets)

2.3.8 Street Lighting Technical Working Group No. 9

- Date: Thursday 19 July 2012
- Attendees: Ausgrid Representatives SLIP Council Representatives SLIP Consultant
- Agenda: Decorative Luminaires 42W CFL Issues Cat P LED trial 125W MBF Replacement Main Roads: Active reactor update, PE cell update, remote monitoring Floodlighting Maintenance Update

Aero screen up cast (brackets)

2.3.9 Street Lighting Technical Working Group No. 10

Date:	Thursday 01 November 2012
Attendees:	Ausgrid Representatives SLIP Council Representatives SLIP Consultant
Agenda:	AS 1158 Update Decorative Luminaires 42W CFL Issues Cat P LED trial 125W MBF Replacement Main Roads: Active reactor update, PE cell update, remote monitoring Floodlighting Repair Times Aero screen up cast (brackets)

2.4 LED Consultation Meeting

This LED Consultation Meeting was held in lieu of the technical working group. See Appendix B.

Date: Friday 09 August 2013

Attendees: Ausgrid Representatives SLIP Council Representatives SLIP Consultant

Agenda:

Outlined Ausgrid's proposal to introduce LED technology as the default technology for category P4 and P5 residential roadway lighting luminaires replacing the current 42W compact fluorescent (CFL). Over the previous 19 months Ausgrid had conducted an LED trial in eight locations and at this time was ready to transition to this technology.

Aim is to install LEDs when existing streetlights on P4 & P5 roads fail and can not be fixed. Existing luminaires on these roads include 42W (CFL), 80W mercury, 50W mercury, T5 fluorescent and the twin 20 fluorescent.

Pricing strategy of the LEDs were discussed showing the comparison between the 42W CFL and LED wattage, capital and maintenance charge, thus saving customers 3% when the 29W LEDs were installed. Pricing structure would be temporary pending AER final approval and any differences in billing corrected once approved.

3.0 LED Information Nights

3.1 Background

The information nights will provide an opportunity for Council representatives to view the LED street lights first hand and raise any questions or concerns about LED street lights directly with suppliers as they will also be attending. See Appendix C.

3.2 Reports

Ausgrid is continuing to further investigate the potential for widespread deployment of LEDs and, if a move to LEDs on residential roads is supported by councils, Ausgrid intends to shortly stage an expression of interest and tender.

The next step now that Ausgrid is confident that there are products available in a competitive market is to trial a sample of these products. The purpose of this trial is to determine the following:

- Suitability of the construction of the LED luminaires for use on the Ausgrid network. In particular category P4 and P5 roads.
- Visual impact and minimisation of glare.
- Council and resident reactions to the new type of lighting.
- Understand what problems may be encountered with the introduction of LED streetlights

Attached is a copy of the LED report that was handed out on the night. See Appendix E.

4.0 New Approaches to 2014-2019 Streetlighting Pricing

Date: 26/02/2014

All Councils and SLIP Consultant were invited to attend an information and feedback session regarding the pricing approach for streetlighting in the next regulatory period: 2014-2019. Ausgrid is interested in the feedback from our customers about pricing strategies for feedback to the AER.

Current pricing method was shown to Councils and the impact of their billing structure was laid out if current methodology was used. This session encouraged opinions and other pricing solutions from our customers. See Appendix D.

5.0 Stakeholder Engagement Report

Date	Location	Stakeholder Name	Stakeholder Representatives	Business / Group Representatives	Issues Discussed	Key Messages/Decisions/ Actions
26/2/14	Ausgrid's Sydney & Wallsend offices	Local Councils within Ausgrid's area and SSROC	Councils and Graham Mawer	Phil McKee David Wilkinson Matthew McQuarrie	Streetlighting Pricing	Future meeting planned
18/12/13	Town Hall	SSROC Councils and Representatives	SSROC Councils and Graham Mawer (SSROC)	Phil McKee David Wilkinson John Bedding	Technology Update Repair of Streetlights Streetlighting Pricing	Future meeting planned for Streetlighting Pricing with all Councils in Ausgrid's area.
22/11/13	Ausgrid Bld	SSROC Representatives	Graham Mawer (SSROC) Alan Northey (SSROC)	Phil McKee David Wilkinson Lars Narushevich	Streetlighting Pricing Service level agreement	Future meeting planned for 18 December 2013.
31/10/13	Ausgrid Bld	SSROC Representative	Graham Mawer (SSROC)	Phil McKee John Bedding Lars Narushevich	Streetlighting Pricing	Future meeting planned
18/7/13	Ausgrid Bld	SSROC Councils and Representatives	Cathy.Edwards (Woollahra Council) Peter Dorman (Newcastle Council) Graham Mawer (SSROC) David Howes (SSROC)	Phil McKee John Bedding Sharn Gokalp	Initial Discussion Service Level Agreement	Future meeting planned

1.0 TECHNICAL WORKING GROUP MEMBERSHIP

From EnergyAustralia (EA) Karmen Wang (Chair) Phil McKee Peter Hosford Michael Brien

From SLIP - SSROC: Paul Gowans, City of Sydney David Pavey, Lake Macquarie Council Sayed Chowdhury, Bankstown Council Boris Bolgoff, Warringah Council Graham Mawer, SLIP consultant

2.0 AGENDA OF MEETING NO. 2

Tuesday 25 August 2009 at 2.30pm – 4.30pm Conference Room 2, Building 1, 25 – 27 Pomeroy St, Homebush

2.1	15 mins	Introduction to Australian Standards and invitation to join Standards Committee LG2	Dr Alec Fisher, Chair of LG2 Committee
2.2	15 mins	Actions from previous meeting	
2.3	15 mins	Accelerated replacement of 2/20s technical issues	Update on T5 / CFL trial results Work instruction
			 Narrow roads – possible use of front glare shield for CFL
			Bracket lengths, shieldsPriority areas for rollout
2.4	15 mins	Cosmopolis	Review available luminaires Update on City of Sydney trial Showcase /Trial opportunities
2.5	15 mins	LEDs	Technical exchange of information Update on City of Sydney trial Showcase /Trial opportunities
2.6	15 mins	Decorative luminaires	New range to be agreed Maintenance of legacy
2.7	15 mins	Metal Halide lamps	Technical exchange of information Trial opportunities
2.8	15 mins	Off-peak dimming / monitoring	

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EA / SLIP (SSROC) STREET LIGHTING TECHNICAL WORKING GROUP AGENDA FOR MEETING No. 3

1.0 TECHNICAL WORKING GROUP MEMBERSHIP

From EnergyAustralia (EA)	Karmen Wang (Chair) Phil McKee Peter Hosford Michael Brien TBA (Minutes)
From SLIP - SSROC:	Paul Gowans, City of Sydney David Pavey, Lake Macquarie Council Sayed Chowdhury, Bankstown Council Boris Bolgoff, Warringah Council Graham Mawer, SLIP consultant

2.0 AGENDA OF MEETING NO. 3

Thursday 19 November 2009 at 11am – 2pm Conference Room 1, Level 9, Roden Cutler House, 24 Campbell St, Sydney

	1			
2.1	11am	Actions from previous meeting		
2.2	11.15 am	Accelerated replacement of 2/20s technical issues	 Work instruction 32W CFL luminaire Narrow roads / bracket lengths, shields Priority areas for rollout 	
2.3	11.40 am	Cosmopolis	Review available luminaires Update on City of Sydney trial Showcase /Trial opportunities	
2.4	12.05 pm	Metal Halide lamps	Technical exchange of information Trial opportunities	
	12.30 pm	Lunch		
2.5	12.55 pm	LEDs	Technical exchange of information Update on City of Sydney trial Showcase /Trial opportunities	
2.6	1.15 pm	Decorative luminaires	Park pathway (functional) Park pathway (decorative) Area lighting (functional) Decorative roadway	
2.7	1.40 pm	Off-peak dimming / monitoring		
	2 pm	Close		

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EA / SLIP (SSROC) STREET LIGHTING TECHNICAL WORKING GROUP AGENDA FOR MEETING No. 4

1.0 TECHNICAL WORKING GROUP MEMBERSHIP

From EnergyAustralia (EA)	Karmen Wang (Chair) Phil McKee Michael Brien Peter Hosford TBA (Minutes)
From SLIP - SSROC:	Paul Gowans, City of Sydney David Pavey, Cessnock Council Sayed Chowdhury, Bankstown Council Boris Bolgoff, Warringah Council

2.0 AGENDA OF MEETING NO. 4

Thursday 25 February 2010 at 11.30am – 2.30pm Conference Room 1, Level 9, Roden Cutler House, 24 Campbell St, Sydney

Graham Mawer, SLIP consultant

2.1	11.30am	Minutes from previous meeting
2.2	11.35 am	Accelerated replacement of 2/20s technical issues
2.3	11.55 am	Cosmopolis
2.4	12.15 pm	Metal Halide lamps
	12.35 pm	Lunch
2.5	1 pm	LEDs
2.6	1.20 pm	Decorative luminaires
2.7	1.40 pm	Off-peak dimming / monitoring
2.8	2 pm	Twin arc / long life sodium lamps
2.9	2.20 pm	General Business
	2.30 pm	Close

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EA / SLIP (SSROC) STREET LIGHTING TECHNICAL WORKING GROUP AGENDA FOR MEETING No. 5

1.0 TECHNICAL WORKING GROUP MEMBERSHIP

From EnergyAustralia (EA)	Karmen Wang (Chair) Phil McKee Michael Brien Peter Hosford Genevieve Mati (Minutes)
From SLIP - SSROC:	Paul Gowans, City of Sydney David Pavey, Cessnock Council Sayed Chowdhury, Bankstown Council Boris Bolgoff, Warringah Council Graham Mawer, SLIP consultant

2.0 AGENDA OF MEETING NO. 5

Thursday 6 May 2010 at 11.30am – 2.00pm Conference Room 1, Level 9, Roden Cutler House, 24 Campbell St, Sydney

2.1	11.30am	Minutes from previous meeting
2.2	11.40 am	Accelerated replacement of 2/20s technical issues
2.3	12.00 pm	Cosmopolis / Metal halide lamps
2.4	12.00 pm	Lunch arrives (working lunch)
2.5	12.30 pm	LEDs
2.6	12.50 pm	Decorative luminaires
2.7	1.10 pm	Off-peak dimming / monitoring
2.8	1.30 pm	General Business
	1.50 pm	Close

1.0 TECHNICAL WORKING GROUP MEMBERSHIP

From Ausgrid Karmen Wang (Chair) Phil McKee (Manager – Street Lighting) Peter Hosford Stephanie Fahy (Minute Secretary)

From SLIP – SSROC Paul Gowans, City of Sydney Council Sayed Chowdhury, Bankstown Council Boris Bolgoff, Warringah Council Graham Mawer, SLIP consultant

2.0 AGENDA OF MEETING No. 6

Thursday 12th August 2010 11.30AM - 1.30PM Conference Room 1, Level 9, Roden Cutler House, 24 Campbell St. Sydney

2.1	Actions from previous meeting
2.2	32 CFL Luminaire
2.3	Cosmopolis/ Metal Halide lamps
2.4	LED trial
2.5	Decorative Luminaires
2.6	Off-Peak Dimming
2.7	AS/NZS Discontinuation of 125W Mercury Vapour
2.8	General business

1.0 TECHNICAL WORKING GROUP MEMBERSHIP

From EnergyAustralia (EA)	Phil McKee (Chair) Peter Hosford Stephanie Fahy (Minutes)
From SLIP - SSROC:	Paul Gowans, City of Sydney David Pavey, Cessnock Council Sayed Chowdhury, Bankstown Council Boris Bolgoff, Warringah Council Graham Mawer, SLIP consultant

2.0 AGENDA OF MEETING NO. 7

Tuesday 1 March 2011 at 11am – 2.00pm Conference Room 1, Level 9, Roden Cutler House, 24 Campbell St, Sydney

2.1	11.00am	Actions from previous meeting		
2.2				
		Proactive use of glare shield in narrow roads		
2.3	11.30 am	Cosmopolis / Metal halide lamps		
2.4	11.45 am	LEDs		
2.5	12.00 pm	Lunch		
2.6	12.15 pm	Decorative luminaires		
2.7	12.30 pm	Off-peak dimming / monitoring		
2.8	12.45 pm	AS/NZS discontinuation of 125W mercury vapour from 1 January 2011		
2.9	1.00pm	NS119 Street Lighting Standard Update		
2.10	1:15pm	Street Lighting Management Plan Update		
2.11	1.30 pm	General Business		
	1.45 pm	Close		

1.0 TECHNICAL WORKING GROUP MEMBERSHIP

From Ausgrid	John Bedding (Chair) Phil McKee Andrew Scott (Minutes)
From SLIP – SSROC	Paul Gowans, City of Sydney Graham Mawer, SLIP consultant Jeff Bush, Upper Hunter Shire Council Sayed Chowdhury, Bankstown City Council
Apologies	Peter Dormand, Newcastle City Council Michael Doyle, The Hills Shire Council Boris Bolgoff, Warringah City Council

2.0 AGENDA OF MEETING No. 8

Thursday 15 December 2011 at 11:00 – 2:00 Conference Room 1, Level 9, Roden Cutler House, 24 Campbell St. Sydney

2.1	Actions from previous meeting			
2.2	Decorative luminaires			
2.3	42W CFL issues			
2.4	Cat P LED trial			
2.5	125W MBF replacement			
2.6	Main Roads: Active reactor update, PE cell update, remote			
	monitoring			
2.7	Floodlighting			
2.8	Maintenance update			
2.9	Aeroscreen upcast (brackets)			
2.10	General business			

1.0 TECHNICAL WORKING GROUP MEMBERSHIP

From Ausgrid	John Bedding (Chair) Phil McKee Geraldine Shanahan (Minutes)
From SLIP – SSROC	Paul Gowans, City of Sydney Graham Mawer, SLIP consultant Peter Dormand, Newcastle City Council Michael Doyle - The Hills Shire Council Adam Clarke - Newcastle City Council Steele Adams - Newcastle City Council

Apologies

Neil Pope – Muswellbrook Council Ross Fleming – Manly Council Stephen Hawes – Maitland City Council

Sayed Chowdhury, Bankstown City Council

2.0 AGENDA OF MEETING No. 9

Thursday 19 July 2011 at 11:00 – 2:00 Conference Room 1, Level 9, Roden Cutler House, 24 Campbell St. Sydney

2.1	Actions from previous meeting			
2.2	Decorative luminaires			
2.3	42W CFL issues			
2.4	Cat P LED trial			
2.5	125W MBF replacement			
2.6	Main Roads: Active reactor update, PE cell update, remote			
	monitoring			
2.7	Floodlighting			
2.8	Maintenance update			
2.9	Aeroscreen upcast (brackets)			
2.10	General business (GM Briefing notes)			

1.0 TECHNICAL WORKING GROUP MEMBERSHIP

From Ausgrid	John Bedding (Chair)			
	Phil McKee			
	Geraldine Shanahan (Minutes)			

From SLIP – SSROC Paul Gowans, City of Sydney Graham Mawer, SLIP consultant Peter Dormand, Newcastle City Council Michael Doyle, The Hills Shire Council Michael Wojcik, Auburn Council Isabelle Albert, Bankstown City Council

Apologies

2.0 AGENDA OF MEETING No. 10

Thursday 1 November 2012 at 9:30 – 12:00 Conference Room 1, Building 1, Level 1, Homebush Depot, 25 -27 Pomeroy St, Homebush

2.1	Actions from previous meeting				
2.2	AS1158 Update				
2.3	Decorative Luminaires				
2.4	42W CFL issues				
2.5	Cat P LED trial				
2.6	125W MBF replacement				
2.7	Main Roads: Active reactor update, PE cell update, remote monitoring				
2.8	Floodlighting				
2.9	Repair times				
2.10	Aeroscreen upcast (brackets)				
2.11	General business				

APPENDIX B





Fri 09/08/2013 2:00 PM - 3:30 PM

Location: Dial in Access Number :1800 681 583 (note this number will transfer, please hold on) Guest Pin :762 895 28 0639# or at Ausgrid, 25 - 27 Pomeroy Street Homebush, Building 1 Level 1 Conference Room 1

This entry has an alarm. The alarm will go off before the entry starts.

Required:	aboyd@hornsby.nsw.gov.au, afoxe@ssc.nsw.gov.au, an@ssroc.nsw.gov.au, aogle@ryde.nsw.gov.au, Boris.Bolgoff@warringah.nsw.gov.au, Cathy.Edwards-Davis@woollahra.nsw.gov.au, coymar@northsydney.nsw.gov.au, C.Covich@mosman.nsw.gov.au, danirat@canterbury.nsw.gov.au, david.dibiase@willoughby.nsw.gov.au, DLinden@hurstville.nsw.gov.au, Edi.Ediriwickrama@muswellbrook.nsw.gov.au, Epeli.naivalu@strathfield.nsw.gov.au, gmawer@nextenergy.com.au, innesd@huntershill.nsw.gov.au, john.inglese@burwood.nsw.gov.au, JBush@upperhunter.nsw.gov.au, joe.ingegneri@randwick.nsw.gov.au, john.earls@canadabay.nsw.gov.au, john.inglese@burwood.nsw.gov.au, Kosta Hagiliamis/energyAustralia/AU@energyAustralia, Iniblock@parracity.nsw.gov.au, margie.azmi@gosford.nsw.gov.au, matthew.stewart@bankstown.nsw.gov.au, mengg@marrickville.nsw.gov.au, michael.wojcik@auburn.nsw.gov.au, michelle.viola@portstephens.nsw.gov.au, MinasK@waverley.nsw.gov.au, mlaunders@singleton.nsw.gov.au, obi.thomas@kogarah.nsw.gov.au, pbritton@ncc.nsw.gov.au, pgowans@cityofsydney.nsw.gov.au, pintaralay@rockdale.nsw.gov.au, pmcmurray@lakemac.nsw.gov.au, SMDignam@wyong.nsw.gov.au, StephenH@maitland.nsw.gov.au, tomh@lmc.nsw.gov.au, turner@kmc.nsw.gov.au, waid.crockett@cessnock.nsw.gov.au, wrylands@lanecove.nsw.gov.au
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Description

Category P4 and P5 residential roadway lighting LED luminaires

Ausgrid would like to invite you to attend a consultation meeting to discuss the introduction of LED technology.

Ausgrid is proposing to introduce LED technology as the default technology for category P4 and P5 residential roadway lighting luminaires replacing the current 42W compact fluorescent (CFL).

Ausgrid has been evaluating LED technology over the past 19 months, through a trial in eight locations and is now in a position to transition to this technology.

We do not propose to undertake an accelerated replacement program. Under our proposal, LEDs will be installed when existing streetlights on P4 & P5 roads fail and can not be fixed. Existing luminaires on these roads include 42W (CFL), 80W mercury, 50W mercury, T5 fluorescent and the twin 20 fluorescent.

The LED luminaire has a total power consumption of 29W.

Our proposed price for the LED luminaire for the current year is: Capital Charge: \$ 48.03 per annum (excluding GST) Maintenance Charge: \$ 34.01 per annum (excluding GST)

Total Maintenance and Capital Pricing for LED luminaire = \$82.04 (annual charge excluding GST)

Capital	Maintenance	Energy(W)	Burn Hour s	*Estimated Energy Cost (including retail energy, network distribution, losses, market, environmental charges and carbon price)	TOTAL	% Savings

42WCFL	\$26.42	\$47.03	46.4	4341	\$31.02	\$104.47	
LED29W	\$48.03	\$34.01	29	4341	\$19.39	\$101.43	3.00%

* Information supplied by SSROC.

If councils agree, Ausgrid proposes to deploy LED luminaires immediately following the consultation meeting, Ausgrid will write to councils seeking formal endorsement to make LED technology the default luminaire for category P4 and P5 residential roadway lighting luminaires. Ausgrid will then seek pricing approval from the AER.

If a luminaire is replaced with a new LED, Ausgrid proposes to continue to charge councils the existing luminaire price until the new LED luminaire price has been approved by the AER.

Once approved by the AER the bills will be backdated to the installation date of the LED luminaire and councils credited with any difference. This has been endorsed by the AER.

In March 2012 Ausgrid proposed to Standards Australia to update the standard (AS1158) to include LED technology. The draft standard (which now includes LEDs) was released this week for public comment. The proposed LED luminaire, the Sylvania Streetled, complies with the draft standard.

Regards,



570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

5 April 2012

Ms Vanessa Chan General Manager Ashfield Municipal Council PO Box 1145 Ashfield NSW 1800

Dear Ms Chan,

LED Street Light Trial of Residential Roads - Information Nights

As you may be aware, Ausgrid is currently conducting a series of LED street lighting trials on residential roads. These trials have now been running for some months and Ausgrid is keen to hear directly from Councils about their impressions of this new lighting technology. Ausgrid would like to invite anyone who is interested from your Council to attend one of four LED information nights as detailed below:

Council	Address	Suburb	Date	Supplier
Wyong	34-90 Irene Pde	Noraville	Wednesday 2 May 2012 5.30pm	Sylvania
Ryde	1-48 Betty Hendry Pde	North Ryde	Wednesday 16 May 2012 5.30pm	Sylvania
Bankstown	Oak Drive (Between 7 Ash St and Whitemore Ave)	Georges Hall	Wednesday 23 May 2012 5.30pm	Pecan (LRL)
Sutherland	1 - 24 Coast Ave & 1-21 Arthur Ave	Cronulla	Wednesday 30 May 2012 5.30pm	Orangetek

The information nights will provide an opportunity for Council representatives to view the LED street lights first hand and raise any questions or concerns about LED street lights directly with suppliers as they will also be attending. The agenda for the night is as follows:

5.30pm – Welcome

Note: Following resident feedback 4 out of the 8 LED lights at the Georges Hall site will be increased from 22 watts to 28 watts to increase lighting levels for viewing on the night. This will provide a great opportunity to compare the different lighting levels at the one site.

RSVP To Phil McKee via e-mail publiclighting@ausgrid.com.au by Thursday 26 April 2012.

Please indicate the sites/s you will be attending.

If you have any questions or require further information on this matter, please do not hesitate to call me directly on (02) 8001 3339.

Phil MC

Phil McKee Manager - Street Lighting

5 April 2012

Mr John Burgess General Manager Auburn Council PO Box 118 Auburn NSW 1835 Ausgrid

570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Mr Burgess,

LED Street Light Trial of Residential Roads - Information Nights

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Please indicate the sites/s you will be attending.

If you have any questions or require further information on this matter, please do not hesitate to call me directly on (02) 8001 3339.

Phil MC

Phil McKee Manager - Street Lighting

5 April 2012



570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Mr Matthew Stewart General Manager Bankstown City Council PO Box 8 Bankstown NSW 1885

Dear Mr Stewart,

LED Street Light Trial of Residential Roads - Information Nights

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RSVP To Phil McKee via e-mail publiclighting@ausgrid.com.au by Thursday 26 April 2012.

Please indicate the sites/s you will be attending.

If you have any questions or require further information on this matter, please do not hesitate to call me directly on (02) 8001 3339.

Phil MC

Phil McKee Manager - Street Lighting

5 April 2012



570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Mr Dave Walker General Manager The Hills Shire Council PO Box 75 Castle Hill NSW 1765

Dear Mr Walker,

LED Street Light Trial of Residential Roads - Information Nights

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Ms Lara Kirchner General Manager Botany Bay City Council PO Box 331 Mascot NSW 1460

Dear Ms Kirchner,

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Phil MC

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5 April 2012

Mr Michael McMahon General Manager Burwood Council PO Box 240 Burwood NSW 1805 Ausgrid

570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Mr McMahon,

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Mr Jim Montague,PSM General Manager Canterbury City Council PO Box 77 Campsie NSW 2194

Dear Mr Montague, PSM,

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5 April 2012



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Ms Lea Rosser General Manager Cessnock City Council PO Box 152 Cessnock NSW 2325

Dear Ms Rosser,

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Mr Gary Sawyer General Manager City of Canada Bay Council Locked Bag 1470 Drummoyne NSW 1470

Dear Mr Sawyer,

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Phil MC

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Ms Monica Barone CEO City of Sydney Council GPO Box 1591 Sydney NSW 2001 570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Ms Barone,

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Mr Peter Wilson General Manager Gosford City Council PO Box 21 Gosford NSW 2250 570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Mr Wilson,

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Mr Scott Phillips General Manager Hornsby Shire Council PO Box 37 Hornsby NSW 1630

Dear Mr Phillips,

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Mr Barry Smith General Manager Hunters Hill Council PO Box 21 Hunters Hill NSW 2110 570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830

www.ausgrid.com.au

Dear Mr Smith,

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Mr Victor Lampe

General Manager



570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Hurstville City Council PO Box 205 Hurstville BC NSW 1481

Dear Mr Lampe,

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Mr Paul Woods General Manager Kogarah Municipal Council Locked Bag 8 Kogarah NSW 2217

Dear Mr Woods,

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Mr John McKee General Manager Ku-ring-gai Council Locked Bag 1056 Pymble NSW 2073 570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

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Mr Brian Bell General Manager (CEO) Lake Macquarie City Council Box 1906 Hunter Region Mail Centre NSW 2310

Dear Mr Bell,

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Mr Peter Brown General Manager Lane Cove Municipal Council PO Box 20 Lane Cove NSW 1595

Dear Mr Brown,

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Mr Peter Head General Manager Leichhardt Municipal Council PO Box 45 Leichhardt NSW 2040

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Please indicate the sites/s you will be attending.

If you have any questions or require further information on this matter, please do not hesitate to call me directly on (02) 8001 3339.

Phil MC

Phil McKee Manager - Street Lighting

Mr David Evans General Manager Maitland City Council PO Box 220 Maitland NSW 2320 Ausgrid

570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Mr Evans,

LED Street Light Trial of Residential Roads - Information Nights

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Phil MC

Phil McKee Manager - Street Lighting

Mr Henry Wong General Manager Manly Council PO Box 82 Manly NSW 1655 570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Mr Wong,

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Phil MC

Phil McKee Manager - Street Lighting

Mr Ken Gainger General Manager Marrickville Council PO Box 14 Petersham NSW 2049 570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525

F +61 2 9269 2830 www.ausgrid.com.au

Dear Mr Gainger,

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Mr V.H.R May, PSM General Manager Mosman Municipal Council PO Box 211 Spit Junction NSW 2088

Dear Mr May, PSM,

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Mr Steve McDonald General Manager Muswellbrook Shire Council PO Box 122 Muswellbrook NSW 2333

Dear Mr McDonald,

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Mr Phil Pearce General Manager Newcastle City Council PO Box 489 Newcastle NSW 2300

Dear Mr Pearce,

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Phil MC

Phil McKee Manager - Street Lighting

Ms Penny Holloway General Manager North Sydney Council PO Box 12 North Sydney NSW 2059 Ausgrid

570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Ms Holloway,

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Phil MC

Phil McKee Manager - Street Lighting

Mr Mark Ferguson General Manager Pittwater Council PO Box 882 Mona Vale NSW 1660 Ausgrid

570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Mr Ferguson,

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Mr Peter Gesling General Manager Port Stephens Council PO Box 42 Raymond Terrace NSW 2324

Dear Mr Gesling,

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Phil MC

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Mr Ray Brownlee General Manager Randwick City Council 30 Frances Street Randwick NSW 2031 570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001

T +61 2 131 525

F +61 2 9269 2830

www.ausgrid.com.au

Dear Mr Brownlee,

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Ms Meredith Wallace General Manager Rockdale City Council PO Box 21 Rockdale NSW 2216

Dear Ms Wallace,

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Phil MC

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Mr John Neish General Manager City of Ryde Locked Bag 2069 North Ryde NSW 1670 570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Mr Neish,

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Ms Lyndy Hyam General Manager Singleton Shire Council PO Box 314 Singleton NSW 2330

Dear Ms Hyam,

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Mr David Backhouse General Manager Strathfield Municipal Council PO Box 120 Strathfield NSW 2135

Dear Mr Backhouse,

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Mr John Rayner General Manager Sutherland Shire Council Locked Bag 17 Sutherland NSW 1499

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Dr Robert Lang CEO Parramatta City Council PO Box 32 Parramatta NSW 2124 Ausgrid

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Dear Dr Lang,

LED Street Light Trial of Residential Roads - Information Nights

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Sutherland	1 - 24 Coast Ave & 1-21 Arthur Ave	Cronulla	Wednesday 30 May 2012 5.30pm	Orangetek

The information nights will provide an opportunity for Council representatives to view the LED street lights first hand and raise any questions or concerns about LED street lights directly with suppliers as they will also be attending. The agenda for the night is as follows:

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Note: Following resident feedback 4 out of the 8 LED lights at the Georges Hall site will be increased from 22 watts to 28 watts to increase lighting levels for viewing on the night. This will provide a great opportunity to compare the different lighting levels at the one site.

RSVP To Phil McKee via e-mail publiclighting@ausgrid.com.au by Thursday 26 April 2012.

Please indicate the sites/s you will be attending.

If you have any questions or require further information on this matter, please do not hesitate to call me directly on (02) 8001 3339.

Phil MC

Phil McKee Manager - Street Lighting



570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Mr Daryl Dutton General Manager Upper Hunter Shire Council PO Box 208 SCONE NSW 2337

Dear Mr Dutton,

LED Street Light Trial of Residential Roads - Information Nights

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Phil MC

Phil McKee Manager - Street Lighting



570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Mr Rik Hart General Manager Warringah Council 725 Pittwater Road Dee Why NSW 2099

Dear Mr Hart,

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Phil MC

Phil McKee Manager - Street Lighting



570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Mr Tony Reed General Manager Waverley Council PO Box 9 Bondi Junction NSW 2022

Dear Mr Reed,

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Phil MC

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570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Mr Nick Tobin General Manager Willoughby City Council PO Box 57 Chatswood NSW 2057

Dear Mr Tobin,

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Phil MC

Phil McKee Manager - Street Lighting

Mr Gary James General Manager Woollahra Council PO Box 61 Double Bay NSW 1360 Ausgrid

570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Mr James,

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Phil MC

Phil McKee Manager - Street Lighting

Mr Michael Whittaker General Manager Wyong Shire Council PO Box 20 Wyong NSW 2259 570 George Street Sydney NSW 2000 All mail to GPO Box 4009 Sydney NSW 2001 T +61 2 131 525 F +61 2 9269 2830 www.ausgrid.com.au

Dear Mr Whittaker,

LED Street Light Trial of Residential Roads - Information Nights

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Please indicate the sites/s you will be attending.

If you have any questions or require further information on this matter, please do not hesitate to call me directly on (02) 8001 3339.

Plut Mckee

Phil McKee Manager - Street Lighting

New Approaches to 2014-2019 Streetlighting Pricing

Ausgrid would like to invite you to attend a consultation meeting to discuss new approaches to Streetlighting pricing 2014 - 2019.

As you would be aware the current pricing for Streetlighting is made up of the following:

1. Capital Charge:

Pre 2009 assets (Fixed Charge) (different price for the same component across Councils, dependent on age of assets) Post 2009 assets (Annuity Charge) (same price across Councils)

2. Maintenance Charge (same price across Councils)

If we continue using the above pricing model, then the pricing for the next regulatory period will most likely be as follows:

1. Capital Charge: Pre 2009 assets (Fixed Charge) Post 2009 - Pre July 2014 assets (Fixed Charge) Post July 2014 assets (Annuity Charge)

2. Maintenance Charge (same price across Councils)

There exists an opportunity to change the approach to Streetlighting pricing and Ausgrid would like to present a range of options to you. We welcome feedback on the approaches that will be presented.

An invitation is extended to Councils who wish to present other pricing solutions or suggestions at the meeting. If you wish to present on the day, please contact me via email by Monday 24 February, 2014, and I will add you to the agenda. Please provide details of your name, the Council you are representing and attach a copy of your presentation slides to enable them to be loaded prior to the event.

A representative/s from the AER will be in attendance at the meeting.

The presentation will be held in the Auditorium at our offices in George Street Sydney. In addition, a video conference facility will be made available at our offices at Wallsend (Newcastle).

APPENDIX E



Streetlighting

CATEGORY P LED LUMINAIRE TRIAL

INTERIM REPORT

May 2012

Table of Contents

Executive Summary	3
Introduction	
Tender Process	6
Technical Details of Products Chosen	7
Trial Sites	12
Before and After Resident Surveys	13
Photometry Results and Issues Encountered	
Before and After Photos	
Conclusion	

Executive Summary

Light Emitting Diodes (LEDs) are a rapidly emerging technology for roadway lighting which are energy efficient, produce high quality white lighting and are potentially highly reliable. The key challenges with LEDs at present include high (but decreasing) capital costs, questions about glare and finding products that meet Australian Standards for road lighting. While LEDs have been much discussed in recent years, it has taken some time for market-ready products to emerge that meet the unique requirements of the Australian Standard for road lighting, AS/NZS 1158.

To explore the current capabilities of LED roadway lighting, Ausgrid is currently staging an LED trial on residential roadways. Ausgrid selected three LED trial technologies following a public tender that garnered 30 responses from lighting suppliers. The chosen luminaires are from LED Roadway Lighting (SAT-24S at 22-28W), OrangeTek (Terraled 48 at 50W) and Sylvania Lighting Australia (Sylvania StreetLED at 29W).

Councils served by Ausgrid nominated a total of 15 potential LED trial sites of which eight were chosen from across the Ausgrid network. Each trial site consisted of at least six lights and the total trial consisted of 63 lights.

Ausgrid's LED trial, believed to be one of the most comprehensive to date by an Australian utility, has demonstrated that:

- A range of lighting suppliers are now able to provide LED luminaires for residential roadways that meet the key requirements of AS/NZ 1158.
- The majority of residents prefer the LEDs to the previous lighting (generally tubular fluorescent and mercury vapour) and 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.
- Photometric surveys substantiated LED performance claims and were generally consistent with photometric modelling.
- All LED trial sites and technologies show marked improvements in both uniformity and the length of roadway that is effectively lit as compared with the previous lighting. Before and after site photography in this report shows clear illustrations of this.

Ausgrid's conclusion is that there does appear to be a strong emerging commercial, technical and environmental case for the adoption of LEDs.

Ausgrid is continuing to further investigate the potential for widespread deployment of LEDs and, if a move to LEDs on residential roads is supported by councils, Ausgrid intends to shortly stage an expression of interest and tender.

INTRODUCTION AND TENDER PROCESS

Introduction

Ausgrid owns and maintains approximately 250,000 streetlights on behalf of 41 local councils. Ausgrid's goal is to provide the most energy efficient cost effective solutions to councils whilst minimising Ausgrid's operational costs. LED streetlights are evolving over the world as a technology that can meet these criteria.

It has taken some time for LED streetlighting manufacturers to consider producing streetlights specifically for the Australian and New Zealand markets. There are some significant differences between the Asian, European and American markets which prevent an "off the shelf" solution being chosen from one of these markets to use in Australia. This creates a commercial challenge for the manufacturers because on a global scale the Australian market is small. This then translates to a trade off situation for Ausgrid between capital and operational costs of the new technology verse the current. It appears now however that we do have the attention of LED streetlight manufacturers and there are now a number of products appearing that can compete with existing technology both technically and at a commercial level.

The next step now that Ausgrid is confident that there are products available in a competitive market is to trial a sample of these products. The purpose of this trial is to determine the following:

- Suitability of the construction of the LED luminaires for use on the Ausgrid network. In particular category P4 and P5 roads.
- Visual impact and minimisation of glare.
- Council and resident reactions to the new type of lighting.
- Understand what problems may be encountered with the introduction of LED streetlights

5

Tender Process

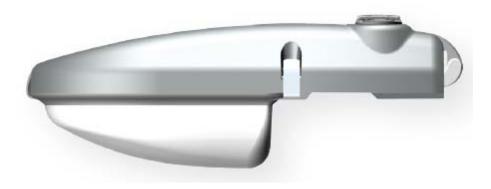
Ausgrid underwent an open tender process to choose the suppliers of the LED streetlights on trial. 30 responses were received and 3 were chosen. Ausgrid used criteria such as cost, technical conformance to the specification, quality, and supply chain to evaluate responses. Cost and technical characteristics of the responses varied significantly and suppliers varied from large multinationals to small Australian firms who had little experience in public lighting.

Ultimately what set the suppliers apart was the ability to comply to category P4 and P5 lighting levels required by AS1158.3 at the spacing that Ausgrid require. Very few suppliers were able to meet this requirement.

TECHNICAL DETAILS OF CHOSEN PRODUCTS

Supplier 1

- Sylvania Street LED
- 25W LED module 18 x 1.4W High Power LEDs
- Total system power consumption 29W
- Precision modelled IP65 LED lens
- Integrated heat sink
- IP67 LED driver
- "Plug & Play" Electronic control gear and LED module.
- Colour Temperature: 5000K
- Colour Rendering Index: \geq 70



Supplier 2

- LED Roadway Lighting SAT-24S
- Power consumption: 28W @ 350mA switchable to 22W @ 280mA
- IP 66 Ingress Protection for both light engine chamber and power supply chamber
- Two independent LED light engines are to be angled at 30° to a horizontal roadway in order to maximize targeted lumen output
- Heat sink fins to be integral with the single-piece cast body
- Colour Temperature 5000K (±500),
- Colour Rendering Index: > 65



Supplier 3

- OrangeTeK Terraled 48
- Power Consumption 50W.
- High Quality 110 Lumen/Watt Nichia LEDs.
- Each LED module is fitted with identical optical lenses to provide optimal efficiency and desired light distribution
- The driver unit is individually sealed to a protection of IP66.
- Colour temperature: 4800K.
- Colour Rendering Index: \geq 70



TRIAL SITES

Trial Sites

Ausgrid invited all councils to submit a site they thought would be suitable for the trial. We received 15 responses by the cut off date and all these sites were evaluated using the following criteria:

- A street / block with little or no trees.
- The road reserve should be of standard width (20 metres).
- The street should be straight and flat.
- The street should be in a quiet residential area (light residential traffic).

Of the sites evaluated 8 were chosen to perform the trial. The sites are:

Cronulla – 1-24 Coast Ave and 1-21 Arthur Ave North Bondi – 126-168 Ramsgate Ave Georges Hall – Oak Drive between 7 Ash St and Whitemore) Wiley Park – Shadforth St (between Lakemba St and Punchbowl Rd) Balgowlah Heights – Bareena Dr (from Woodland St to Dobroyd Scenic Dr) Mosman – Medusa St Noraville – 34-90 Irene Parade North Ryde – 1-48 Betty Hendry Parade

BEFORE AND AFTER RESIDENT SURVEYS

Over 1000 letters were sent to notify residents that their street had been chosen for the LED trial. Accompanying this letter was a survey for residents to complete based on the existing street lighting (shown below). The survey was a way to get the residents to take notice of their existing street lighting so that they would be better able to make a comparison of the LED street lights.

LED Lighting Trial Opinion Survey - November 2011



Before we start our LED lighting trial, please let us know what you think about the existing lighting in your street:

Street name:

<u>Please tick one box from each row</u>	Agree	Slightly agree	Neither agree or disagree	Slightly disagree	Disagree
1. Street lighting in my street is adequate					
2. The daytime appearance of street lights in my street is acceptable					
3. Existing street lights in my street are too bright and/or glary					
4. Existing street lights in my street are too dim and need upgrading					
5. As a pedestrian, existing street lights in my street make me feel safer after dark					
 Existing street lights in my street assist my driving and help me see pedestrians and cyclists better 					
	< 40	40- 49	50-59	60-69	70+
7. My age group is:					

Further comments/suggestions

Please feel free to provide your contact details below if you are happy for us to contact you in the future.

Name :

Address:

Phone:

Please return your survey in the stamped envelope provided

After the LED street lights had been installed for a month we sent out another survey seeking resident's feedback. The results from both of these surveys have been compiled and are tabled on the following pages.

LED Lighting Trial Opinion Survey - February 2012



Now that the trial has started, please let us know what you think of the new lighting in your street: Suburb: BALGOWLAH HEIGHTS

Please tick one box from each row	Agree	Slightly agree	Neither agree or disagree	Slightly disagree	Disagree
1. The new street lighting in my street is adequate					
 I prefer the new street lights as compared to the old street lights 					
3. The daytime appearance of the new street lights in my street is acceptable					
4. New street lights in my street are too bright and/or glary					
5. New street lights in my street are too dim and more light is needed					
6. As a pedestrian, the new street lights in my street make me feel safer after dark than the old lights					
 New street lights in my street assist my driving and help me see pedestrians and cyclists better 					
0. Mar	< 40	40- 49	50-59	60-69	70+
8. My age group is:					

Further comments/suggestions

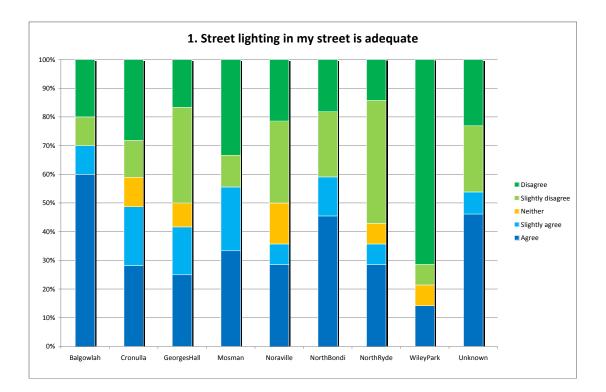
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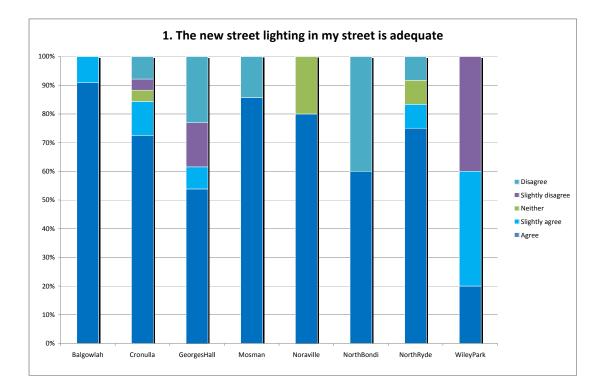
Name :

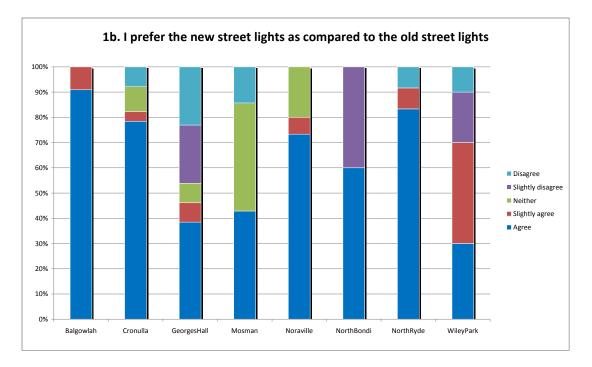
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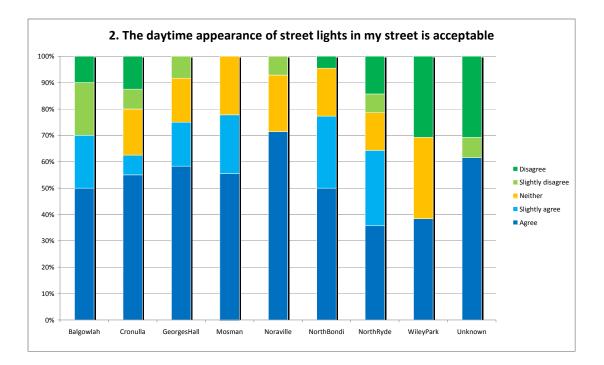
Please return your survey in the stamped envelope provided by 30th March 2012

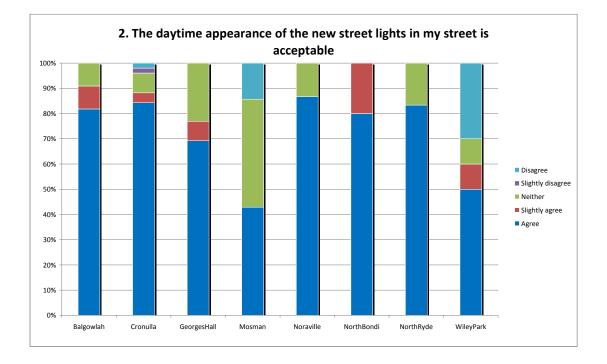


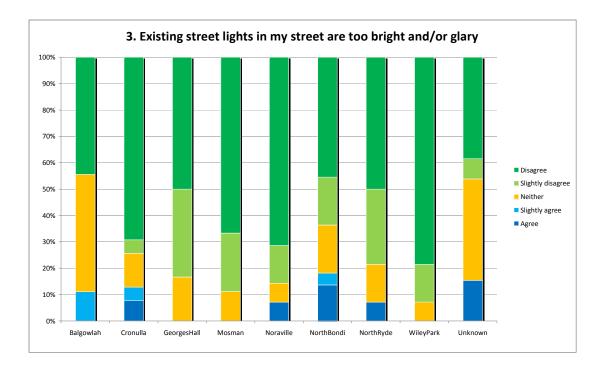


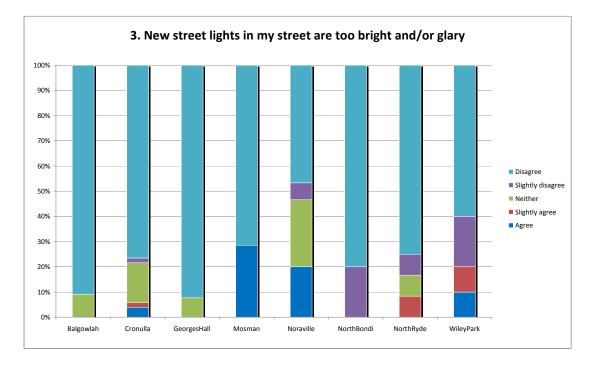


These results show that the majority of the residents prefer the new streetlights to the old. What they also show is that the residents prefer more light. The luminaires trialled at Balgowlah and Cronulla have a significantly higher wattage (50W) than the other trial luminaires which in turn would output more light. As can be seen in the results these two sites have the highest amount of "*Agree*" in the "*I prefer the new street light as compared to the old street lights*" category. Counter to that the locations that have 22W luminaires installed have the least amount of "Agree's" in this category. In response to this we have increased the output of some of luminaries to 28W to determine if there is any discernable improvement in lighting levels. It should be noted that all of these locations met Australian Standards for category P5 and P4 lighting levels.

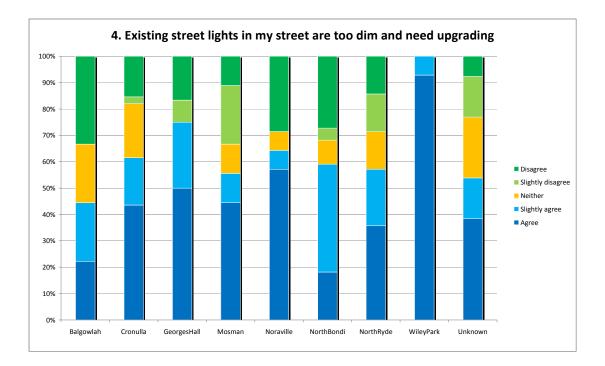


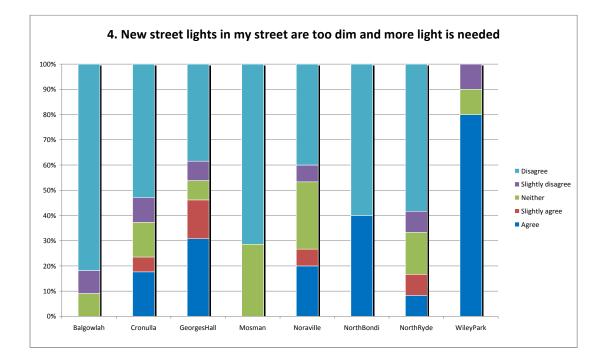


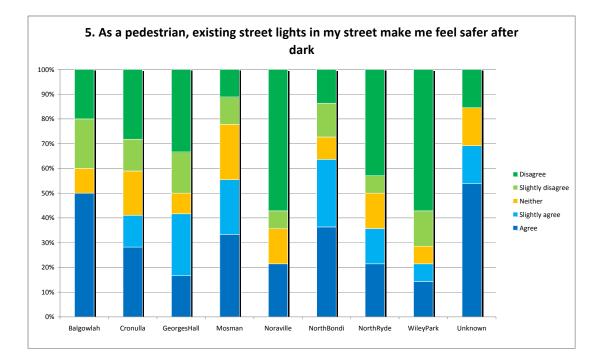


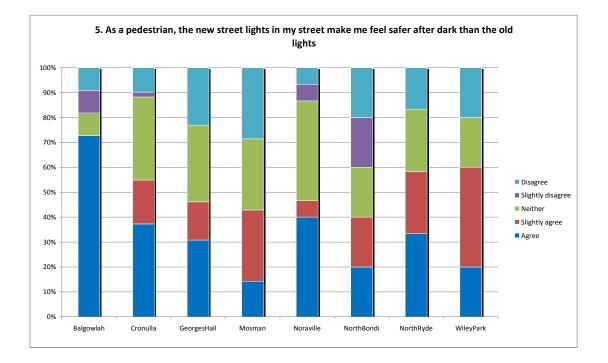


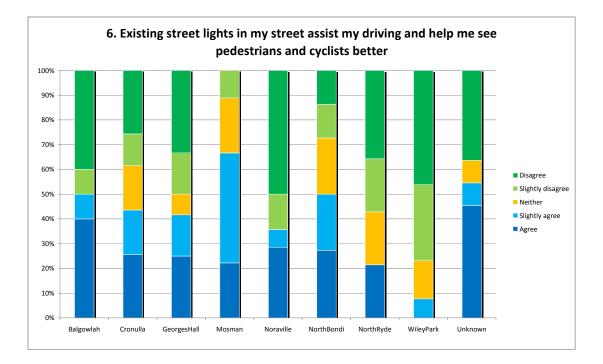
Glare is an issue with all streetlights. However LED streetlights have generated much more discussion in this area due to directional nature of LED's streetlights. As such we included a question in the surveys regarding glare. The results show that the residents do not find the LED streetlights any glarier than the previous streetlights and in fact quite the opposite.

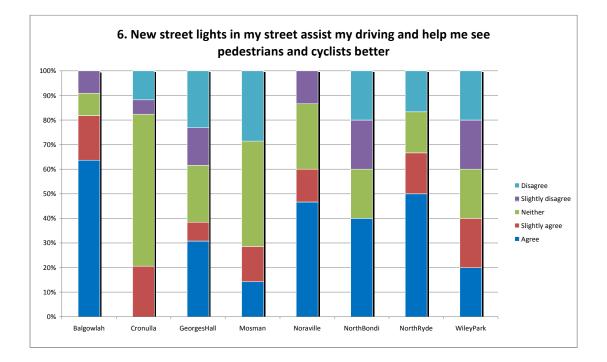


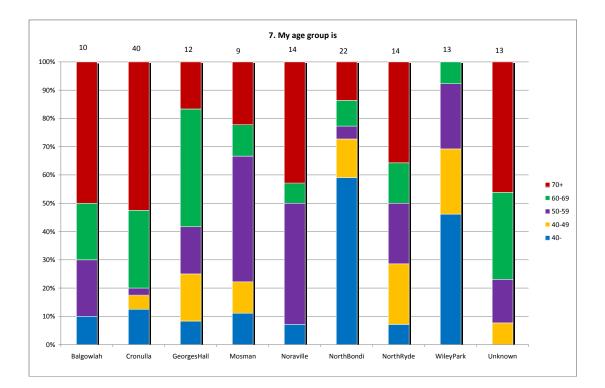


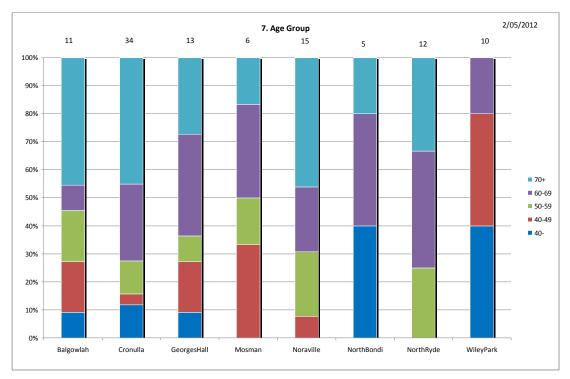












The figure at the top of each bar is the total number of surveys received in each age group.

Overall there has been a positive response from residents to the LED trial.

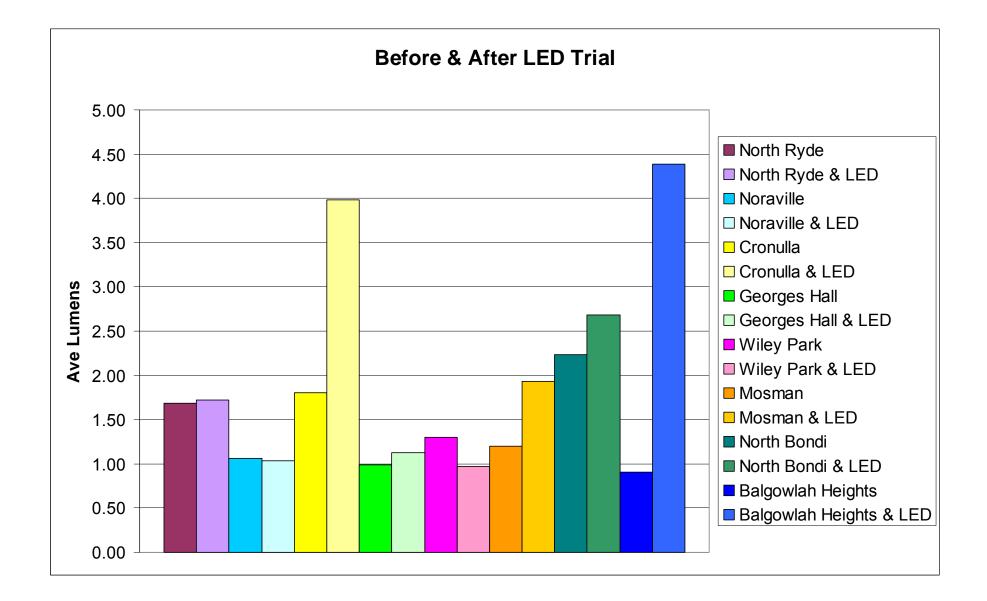
PHOTOMETRY RESULTS AND ISSUES ENCOUNTERED

Light levels were measured at the trial sites before and after the installation of the LED streetlights. The average illuminance measured in Lux is shown on the next page. The average illuminance required by the Australian standard is 0.5 lux for category P5 and 0.85 lux for category P4. The only P4 category site on trial is North Bondi all other are P5. As can be seen by the results all locations exceed the average illuminance level required by Australian Standards. This however is not the only condition required to meet Australian Standards, minimum light levels must exceed 0.07 lux for P5 and 0.14 for P4. As these levels are quite low and difficult to accurately measure, these conditions are verified by calculations rather than by field measurements. However, Ausgrid will not be looking for a bare minimum pass on these conditions but rather a streetlight that is perceived as doing the job as it is intended, i.e. to sufficiently light footpaths and roads.

It should be noted that pole spacing has a significant impact on the average Lux levels. The table below shows the average spacing between poles at the various sites. Average lux levels will increase the closer the poles are spaced and vica verca.

Site	Category	Ave Spacing (m)	
North Ryde	P5	47.4	
Georges Hall	P5	57.4	
Noraville	P5	78.6	
Wiley Park	P5	74.0	
Balgowlah Heights	P5	48.9	
Mosman	P5	56.4	
Cronulla	P5	52.4	
North Bondi	P4	29.8	

The two sites that stand out in these results are the sites that we have installed higher wattage luminaires (Cronulla and Balgowlah) and that have the best overall results in the resident surveys. Wiley Park and Georges Hall have the lowest wattage luminaires installed and this is also evident by the resident responses. 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. We also had an intermittent failure of one unit, however we could not replicate this failure in the lab.



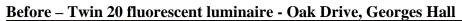
BEFORE AND AFTER PHOTOS



Before – 42W Compact Fluorescent - Betty Hendry Parade, North Ryde

After – 29W LED - Betty Hendry Parade, North Ryde







After – 22W LED- Oak Drive, Georges Hall



This last photo is the site where we have increased the wattage from 22W to 28W. This photo is 22W.

CONCLUSION

The purpose of this trial was to identify the following:

- Suitability of the construction of the LED luminaires for use on the Ausgrid network. In particular category P4 and P5 roads.
- Visual impact and minimisation of glare.
- Council and resident reactions to the new type of lighting.
- Understand what problems may be encountered introduction LED streetlights

To date this trial has shown that LED technology can be used as a suitable replacement for the existing technology. However there are some outstanding issues, particularly with light distribution that need to be addressed. As such this trial will continue until Ausgrid are confident that this technology is ready to be rolled out across our network.

Once we have this confidence the next step will be to seek council approval to change our standard category P lighting to LED. If council agrees we will issue an expression of interest to gauge the market and from this we will short list the responses and go out to a closed tender.