Public Lighting

Public Lighting Annuity Model Procedure

13 May 2011

Version 3.0

Aurora Energy

Document Authorisation

	Name	Signature	Date
Prepared by:	S.Wilson	.....	.....25/02/2010.....
Reviewed by:	L Burrill	.....	.....12/05/2011.....
Accepted by:	C Hopwood	.....	.....13/05/2011.....
Authorised by:	K Rosinski	.....	.....13/05/2011.....

Document Details

Document title	Public Lighting Annuity Model
Document subtitle	Procedures manual
Document Version	Version 3.0
Version Date	13 May 2011
Document file name	NW-#30172250-v3
Print date	

Document Control Sheet

Contact for Enquiries and Proposed Changes

If you have any questions regarding this document contact:

Name: Kim Rosinski
Title: Commercial Manager
Phone: 0419 571 221

Distribution

Issue Date	Name	Title	Company

Version Control

Version	Issue Date	Author	Nature of Amendment (Details)
1.0	25 Feb 2010	S Wilson	Draft for Approval
2.0	12 May 2011	L Burrill	Reviewed
3.0	13 May 2011	K Rosinski	Approved

Table of Contents

1 Background

Aurora operates and maintains the public lighting system throughout Tasmania on behalf of councils and other Government road authorities. The objective of public lighting is to provide a lit environment conducive to the safe and comfortable movement of vehicular and pedestrian traffic during hours of darkness and the discouragement of illegal acts.

The public lighting provided for the community to illuminate outdoor public access areas after dark includes management of luminaries, lamp, support brackets and control systems but excludes the support structures. Poles and lighting structures revenues are included in the calculation of maximum allowable revenue for distribution services.

Public lighting services are those services provided by Aurora for:

- The provision, maintenance and replacement of public lighting assets owned by Aurora;
- The maintenance of public lighting assets owned by customers (contract lighting); and
- The provision, maintenance and replacement of Aurora owned public lighting poles.

Public lighting services exclude:

- The alteration and relocation of public lighting assets, which will be provided on a quoted service basis;
- The installation of contract lights, which will be provided on a quoted service basis; and
- The provision of new public lighting technologies which will be classified as a Negotiated Distribution Service.

Aurora has historically derived its charges for public lighting services through an annuity approach, through its public lighting annuity model.

Aurora proposes to apply a price cap form of control for the forthcoming Regulatory Control Period to all public lighting services, with the charges for public lighting services provided under a schedule of fees, based on the current annuity approach.

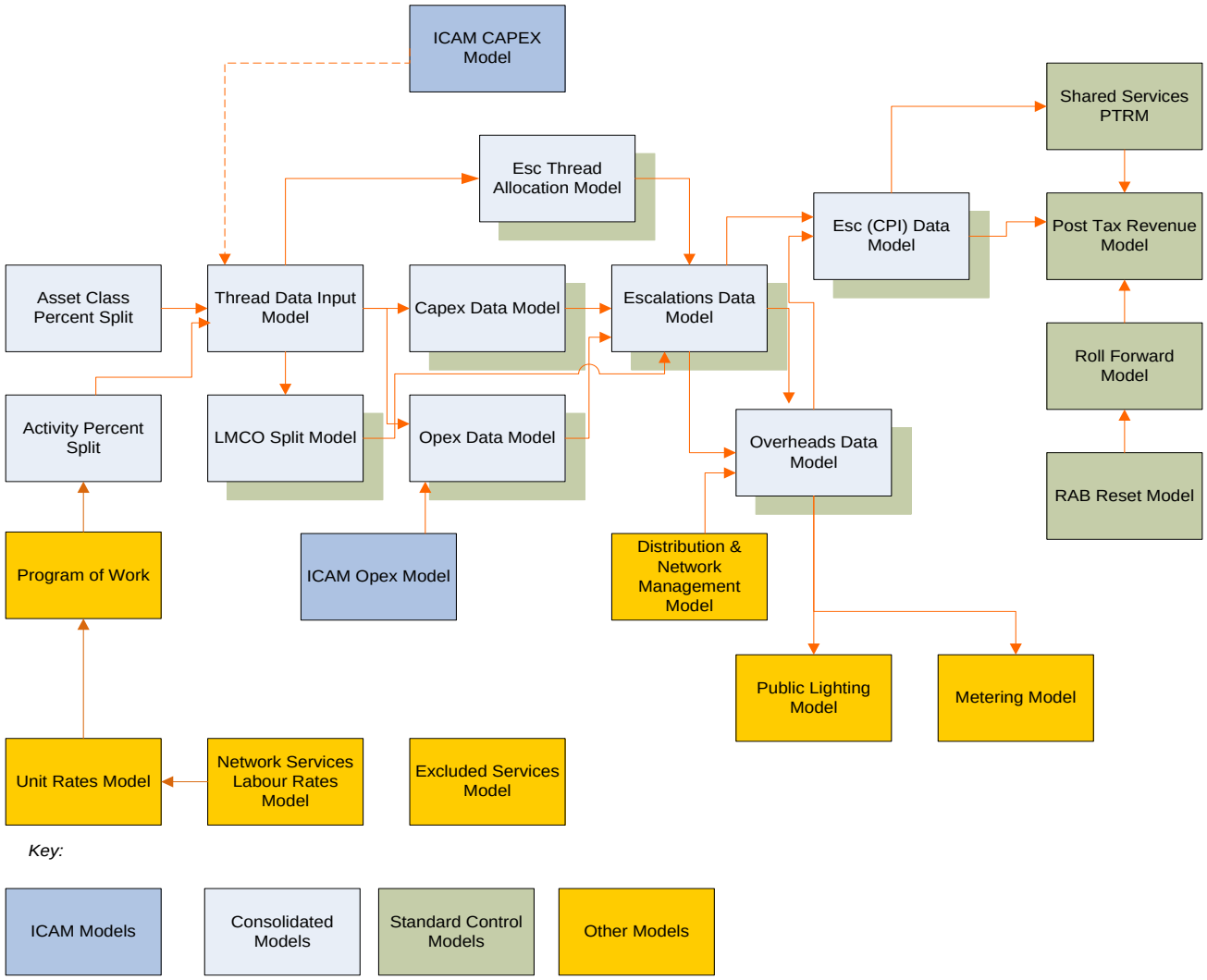
Aurora's public lighting are classified by AS/NZS:1158 into the following categories:

- ***Category 'V'*** - generally referred to as major public lighting, is applicable for roads that the visual requirements of motorists are dominant.
- ***Category 'P'*** - generally referred to as minor public lighting, is applicable for roads that the visual requirements of pedestrians are dominant. Also applicable to outdoor public areas, other than roads, where the visual requirements of pedestrians are dominant, eg: outdoor shopping precincts.

2 Modeling Architecture

The Public Lighting Model is a component model which forms part of the Regulatory Modelling Suite, the model interactions and the entire suite is depicted in Figure 1 (below).

Figure 1



3 Inputs

The following inputs form the basis of the annuity calculations.

3.1 Replacement Volumes

Replacement of public lighting is undertaken on a routine basis throughout each year. Aurora has developed projected public lighting replacement volumes on a financial year basis for each bracket, lamp and luminaire type required for each lighting type. Forecasts have regard for any likely volume growth over the forthcoming Regulatory Control Period.

3.2 Public Lighting Standard Lives

Aurora maintains a register of asset data that is used to determine the standard life of each asset. This is an input into the annuity calculation to derive the number of years over which the replacement cost is recovered.

3.3 Public Lighting Opex

Aurora's program of work is used to forecast operating expenditure volumes associated with public lighting assets.

3.4 Overhead Cost Allocation

The operating expenditure component of Corporate and Shared Services; Network Management; and Distribution Business Shared Resources costs are apportioned on a percentage spend of direct costs, in accordance with Aurora's amended CAM.

3.5 Capital Overhead Cost Component

The capital overhead cost component is apportioned in accordance with the methodology outlined in Aurora's amended CAM.

3.6 Escalation Rates

Input data provided for calculation purposes within the public lighting annuity model has been provided using forecast 2011-12 values. Accordingly, costs are increased across the Regulatory Control Period by:

- Forecast CPI in order to calculate nominal costs; and
- Escalation rates (using SKM escalation rates) which are applied by asset type for capital expenditure, and by discrete cost type (materials, contractors, labour and other) for operating expenditure.

3.7 Material Replacement Costs

For each public lighting service type the relevant volumes are multiplied by the bracket, lamp and luminaire costs as the basis of the annuity calculation.

3.8 Return on Capital

The return on capital is a pre tax real WACC derived using the values outlined in Chapter 20 of Aurora's Regulatory Proposal.

4 Annuity Calculation (Aurora Owned Public Lighting)

Aurora's public lighting annuity model carries out an annuity calculation for the replacement cost of each lamp, bracket and luminaire type for each year of the forthcoming Regulatory Control Period.

The annuity approach is based on the lighting replacement cost, operating expenditure (which is predominantly globe replacement costs), capital expenditure and an allocation of operating and capital overhead costs.

The annuity approach:

- Undertakes an annuity calculation for each public lighting type for each year using the Excel-based PMT function in which:
    - The replacement cost of each public lighting type is the present value parameter (this is escalated across the Regulatory Control Period using materials escalation rates);
    - The asset standard life is the number of years; and
    - A pre-tax real WACC provides the rate of return;
- Estimates operating expenditure associated with the maintenance of public lighting assets. The associated costs are sourced from Aurora's program of work, which provides estimated volumes, and Aurora's unit rates model which provides the relevant costs associated with each public lighting class. The relevant escalation rates across the Regulatory Control Period are already applied to this expenditure;
- Applies operating overheads costs (Corporate and Shared Servicers, Network Division Management and Distribution Business Shared Resource costs) to the operating expenditure component in accordance with the approach outlined within Aurora's amended Cost Allocation Method (CAM). The relevant escalation rates across the Regulatory Control Period are already applied to this overhead expenditure;
- Undertakes an annuity calculation for shared services capital overhead costs (comprising Corporate and Shared Services and Network Division Management capital overhead costs) in accordance with the methodology set out in Aurora's amended CAM. Apportionment to public lighting services occurs on the basis of forecast volumes

  The annuity calculation is undertaken for assets in service at 30 June 2012 and for capital overhead costs applied to public lighting services within the forthcoming Regulatory Control Period in which;
    - For overhead assets in service at 30 June 2012:
        - The written down book value of the assets is the present value parameter;
        - The remaining weighted average asset life is used as the number of years parameter; and
        - A pre-tax real WACC provides the rate of return; and
    - For capital overhead costs applied public lighting services:
        - The applied capital overheads costs is the present value parameter;
        - The asset standard life is the number of years parameter; and
        - A pre-tax real WACC provides the rate of return;
- Aggregates the annuity calculations and operating expenditure (including overheads) for each public lighting class to give an average annual allowance for lighting for each class; and
- Divides the total by the number of days in the year to give a daily allowance for each public lighting class.

The whole process for each public lighting class can be summarised as:

[(annuity for replacement costs including escalations) + (operating expenditure including operating overheads) + (annuity for overhead assets in service) + (annuity for capital overhead costs)] / (days in year)

In determining the final charge for customers a Network Use of System (NUoS) charge is applied. However, these charges are not Alternative Control Services, but are rather derived as part of the tariff setting process for Standard Control Services and as such are not included in the prices set out within this paper.

Prices (exclusive of GST) as calculated for Aurora owned public lighting within the public lighting annuity model are provided in the table below.

Public Lighting - Daily Charge (excluding NUOS) June 2012 cents					
	2012/13	2013/14	2014/15	2015/16	2016/17
50W Mercury Vapour	35.500	35.340	34.874	36.834	35.456
80W Mercury Vapour Aeroscreen	35.500	35.340	34.874	36.834	35.456
80W Mercury Vapour Art decorative	56.351	56.410	56.030	57.899	56.456
125W Mercury Vapour	41.011	40.747	40.217	42.064	40.569
250W Mercury Vapour	41.514	41.255	40.727	42.572	41.075
400W Mercury Vapour	46.389	46.181	45.673	47.496	45.985
70W Sodium Vapour	37.952	37.818	37.362	39.312	37.926
100W Sodium Vapour	38.001	37.813	37.330	39.243	37.820
150W Sodium Vapour	42.313	42.062	41.537	43.379	41.880
250W Sodium Vapour	42.449	42.200	41.676	43.517	42.017
400W Sodium Vapour	42.672	42.425	41.902	43.742	42.242
150W Metal Halide	42.313	42.062	41.537	43.379	41.880
250W Metal Halide	42.449	42.200	41.676	43.517	42.017
2x20W Fluorescent	39.932	39.819	39.371	41.312	39.920
2x40W Fluorescent	39.397	39.224	38.747	40.654	39.227
42W Compact Fluorescent	37.886	37.752	37.296	39.246	37.860
60W Incandescent	34.802	34.635	34.166	36.130	34.754
42W Mercury Vapour	37.886	37.752	37.296	39.246	37.860

5 Annuity Calculation (Contract Lighting)

Aurora's public lighting annuity model carries out an annuity calculation for the maintenance cost of each contract lamp for each year of the forthcoming Regulatory Control Period.

The annuity approach is based on operating expenditure and an allocation of overhead costs.

The annuity approach:

- Estimates operating expenditure associated with the maintenance of contract lighting assets (which is predominantly globe replacement costs). The associated costs are sourced from Aurora's program of work, which provides forecast volumes, and Aurora's unit rates model which provides the relevant costs associated with each lighting class. The relevant escalation rates across the Regulatory Control Period are already applied to this forecast expenditure prior to input into the public lighting annuity model;

- Applies operating overhead costs (Corporate and Shared Services, Network Division Management and Distribution Business Shared Resource costs) to the operating expenditure component in accordance with the approach set out in Aurora's proposed CAM. The relevant escalation rates across the Regulatory Control Period are already applied to this forecast overhead expenditure prior to input into the public lighting annuity model;

- Undertakes an annuity calculation for shared services capital overhead costs (comprising Corporate and Shared Services and Network Division Management capital overhead costs) in accordance with the methodology outlined in Aurora's amended CAM. This is apportioned to contract lighting classes on the basis of forecast volumes.

  The annuity calculation (Excel based PMT function is used) is undertaken for assets in service at 30 June 2012 and for capital overhead costs applied to contract lighting services in the Regulatory Control Period in which;

  - For overhead assets in service at 30 June 2012:
    - The written down book value of the assets is the present value parameter;
    - The remaining weighted average asset life is the number of years parameter; and
    - A pre-tax real WACC provides the rate of return parameter; and
  - For capital overheads costs applied to metering services:
    - The applied capital overheads costs is the present value parameter;
    - The asset standard life is the number of years parameter; and
    - A pre-tax real WACC provides the rate of return parameter;

- Aggregates the annuity calculations and operating expenditure (including overheads) for each contract lighting class to give an average annual allowance for contract lighting by class; and

- Divides the total by the number of days in the year to given a daily allowance for each contract lighting class.

The process, for each contract lighting class can be summarised as:

[(operating expenditure including operating overheads) + (annuity for overheads assets in service) + (annuity for capital overhead costs)] / (days in year)

To determine the final charge for customers a NUoS charge is also applied. However, these charges are not Alternative Control Services, but are rather derived as part of the tariff setting process for Standard Control Services. The NUoS charge is therefore not included in the proposed prices detailed within this paper.

Prices (exclusive of GST) as calculated for contract lighting within the public lighting annuity model are provided in the table below.

Contract Lighting - Daily Charge (excluding NUOS) June 2012 Cents					
	2012/13	2013/14	2014/15	2015/16	2016/17
50W Mercury Vapour	22.966	22.824	22.387	24.467	23.201
80W Mercury Vapour	22.953	22.811	22.373	24.454	23.188
125W Mercury Vapour	23.887	23.701	23.239	25.279	23.973
250W Mercury Vapour	23.968	23.783	23.322	25.361	24.055
400W Mercury Vapour	24.030	23.845	23.385	25.424	24.117
70W Sodium Vapour	23.175	23.035	22.598	24.678	23.411
150W Sodium Vapour	24.687	24.509	24.051	26.087	24.779
250W Sodium Vapour	24.650	24.471	24.013	26.050	24.741
400W Sodium Vapour	24.733	24.555	24.097	26.133	24.825
150W Metal Halide	24.687	24.509	24.051	26.087	24.779
250W Metal Halide	24.650	24.471	24.013	26.050	24.741
400W Metal Halide	24.650	24.471	24.013	26.050	24.741
1x20W Fluorescent	23.026	22.885	22.448	24.528	23.262
2x20W Fluorescent	23.159	23.020	22.583	24.662	23.395
1x40W Fluorescent	23.035	22.894	22.457	24.536	23.270
2x40W Fluorescent	24.096	23.911	23.451	25.490	24.184
3x40W Fluorescent	24.237	24.054	23.595	25.633	24.326
4x40W Fluorescent	25.170	24.997	24.542	26.576	25.266
60W Incandescent	22.950	22.808	22.371	24.451	23.185
100W Incandescent	23.870	23.683	23.222	25.261	23.956
Pole Surcharge	23.911	23.911	23.911	23.846	23.911

6 Glossary

Term	Definition
AER	Australian Energy Regulator
ICAM	Indirect Cost Allocation Model
CAM	Cost Allocation Method
NUoS	Network use of system
SKM	Sinclair Knight Merz