



**Electricity distribution network service providers
Roll forward model handbook**

June 2008

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Contents

Shortened forms	iii
1 Nature and authority.....	1
1.1 Introduction.....	1
1.2 Authority	1
1.3 Role of the model.....	1
1.4 Confidentiality	1
1.5 Process for revision.....	1
1.6 Version history and effective date	2
2 The model.....	3
2.1 Input sheet.....	3
Opening regulatory asset base	4
Actual nominal capital expenditure	7
Actual nominal asset disposals	7
Actual customer contributions	7
Actual real net capital expenditure	7
Inflation and rate of return	8
2.2 Adjustment for previous period sheet.....	8
Nominal adjustments for difference between forecast and actual capex.....	12
Nominal adjustments for difference between forecast and actual assets under construction.....	13
Nominal roll forward for final regulatory year of previous regulatory control period	13
2.3 Actual RAB roll forward sheet	14
Real asset values	16
Nominal asset values.....	17
2.4 Total actual RAB roll forward sheet.....	17
2.5 Tax value roll forward sheet	19
Opening tax asset values.....	20
Actual net capex.....	21
Actual tax depreciation	21

Shortened forms

AER	Australian Energy Regulator
capex	capital expenditure
CPI	consumer price index
DNSP	distribution network service provider
NEL	National Electricity Law
NER	National Electricity Rules
PTRM	post-tax revenue model
RAB	regulatory asset base
RFM	roll forward model
WACC	weighted average cost of capital

1 Nature and authority

1.1 Introduction

This handbook sets out the Australian Energy Regulator's (AER) roll forward model (RFM) which forms part of an electricity distribution network service provider's (DNSP's) revenue proposal.

The AER has published the RFM, this handbook and associated explanatory statement as required by clause 6.5.1(b) of the National Electricity Rules (NER) and in accordance with the distribution consultation procedures under clause 6.16 of the NER.

1.2 Authority

Clause 6.5.1(d) of the NER requires the AER to develop and publish the RFM within 6 months of the commencement of that clause, that is, by 30 June 2008.

1.3 Role of the model

DNSPs are required to submit a completed RFM to the AER as part of their revenue proposals. However, the AER recognises that there may be a need for some flexibility in applying the RFM in order to account for the particular circumstances a DNSP may face. A number of elements of the RFM where this may be the case have been identified in this handbook. A DNSP will need to propose and justify a departure from any element of the RFM for the purposes of addressing its specific circumstances as part of its revenue proposal, which will be considered and assessed by the AER on a case-by-case basis in making its distribution determination.

The RFM will be used by the AER to determine the closing regulatory asset base (RAB) for each DNSP for each regulatory control period. This closing RAB value becomes the opening RAB to be used for the purposes of making a distribution determination for the next regulatory control period. The roll forward of RAB values from the beginning of one regulatory year to the next on a forecast, indicative basis will be done in the AER's post-tax revenue model (PTRM) and in accordance with the requirements of the NER.

1.4 Confidentiality

The AER's obligations regarding confidentiality and the disclosure of information provided to it by a DNSP are governed by the *Trade Practices Act 1974* (Cth), the National Electricity Law (NEL) and the NER.

1.5 Process for revision

The AER may amend or replace the RFM from time to time as provided for by clause 6.5.1(c) of the NER and in accordance with the distribution consultation procedures in clause 6.16 of the NER. The AER will publish a revised version of this handbook to accompany each new or amended version of the RFM.

1.6 Version history and effective date

A version number and an effective date of issue will identify each version of this handbook.

2 The model

The RFM is a set of Microsoft Excel spreadsheets that performs calculations to derive a closing RAB for the current regulatory control period from a given set of inputs relating to capital expenditure (capex), asset disposals, customer contributions, inflation and the rate of return.¹ The RFM allows the user to vary the inputs to assess their impact on the output data and other derived parameters.

2.1 Input sheet

The **Input** sheet provides for key input variables to be entered in the RFM. They are automatically linked to corresponding cells in other relevant sheets. Values should be entered into each cell with light blue shading. This sheet has been split into six sections:

- opening RAB
- actual nominal capex—as-incurred
- actual nominal asset disposals—as-incurred
- actual nominal customer contributions—as-incurred
- actual real net capex—as-incurred
- inflation and rate of return.

The input data must be recorded in the RFM in a format consistent with that requested by the AER's information templates or other requirements that are published from time to time. Any differences or inconsistencies will need to be explained and justified by the DNSP.

Figure 1 provides an example of the **Input** sheet. Note that numbers in the published RFM are for illustrative purposes only.

The RFM can handle input data for a regulatory control period of up to 11 regulatory years. This includes the final regulatory year of the previous regulatory control period and up to 10 regulatory years of the current regulatory control period.² DNSPs may amend the RFM to account for regulatory control periods of longer duration as part of their proposals to the AER.

The RFM is configured to use the straight-line depreciation method as the default position for calculating depreciation. DNSPs may propose depreciation profiles other than the straight-line method in the RFM subject to meeting the requirements in clause 6.5.5(b) of the NER.

¹ The set of Microsoft Excel spreadsheets which constitute the RFM were created in Microsoft Excel 2003. The AER recommends this or a later version of Microsoft Excel be used in applying these spreadsheets.

² For a standard (shorter) regulatory control period, the input spaces which are not required should be left blank or equal to zero.

Similarly, the RFM’s calculations incorporate an actual depreciation incentive framework. Clause S6.2.1(e)(5) does not specify the form of the depreciation calculation which is required. The AER considers this provides for the recognition of alternative depreciation calculations, including incentive frameworks which incorporate the use of forecast depreciation, as appropriate. As noted above, the AER recognises the need for flexibility in applying the RFM to account for the particular circumstances of a DNSP. To this end a DNSP is able to propose as part of its revenue proposal an alternative which departs from the actual depreciation incentive framework provided for in the RFM. Such proposals must be justified by the DNSP and will be considered and assessed by the AER on a case-by-case basis in making its distribution determination.

The RFM is also configured to recognise capex on a full as-incurred approach.³ This method follows from that applied in the PTRM.

Figure 1: Input sheet

	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1																	
2	Input Variables (input cells are in blue)																
3																	
4																	
5	Opening Regulated Asset Base for 2003-04 (\$m Nominal)																
6		Asset Class Name	Opening Asset Value	Remaining Life	Standard Life	Forecast Net Capex	Forecast Regulatory Depreciation	Prudent Additional Allowance	Foregone Return on Additional Capex	Forecast Assets Under Construction	Actual Assets Under Construction	Opening Tax Value	Tax Remaining Life	Tax Standard Life	Base Financial Year		
7	Asset Class 1	Sub-transmission lines	1,000.00	20.0	50.0	40.0						1,000.00	20.0	50.0	2004-05		
8	Asset Class 2	distribution lines	800.00	30.0	50.0	20.0						800.00	30.0	40.0			
9	Asset Class 3	substations	700.00	30.0	40.0	10.0						700.00	30.0	40.0			
10	Asset Class 4	distribution transformers	600.00	30.0	40.0	5.0						600.00	30.0	40.0			
11	Asset Class 5	LVS and meters	500.00	30.0	30.0	5.0						500.00	30.0	40.0			
12	Asset Class 6	communications	400.00	30.0	10.0	5.0						400.00	30.0	40.0			
13	Asset Class 7	vehicles	300.00	30.0	7.0	5.0						300.00	30.0	40.0			
14	Asset Class 8	land and easements	500.00	n/a	n/a	5.0						500.00	n/a	n/a			
15	Asset Class 9																
16	Asset Class 30																
17	Total		4,800.00			95.00											
18																	
19	Actual Capital Expenditure – As Incurred (\$m Nominal)																
20	Year	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14					
21	Total	108.00	115.00	67.00	103.00	58.00	80.00										
22													\$	541.00			
23	Actual Asset Disposal – As Incurred (\$m Nominal)																
24	Year	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14					
25	Total	6.00	6.00	6.00	6.00	6.00	6.00										
26													\$	36.00			
27	Actual Customer Contributions – As Incurred (\$m Nominal)																
28	Year	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14					
29	Total	2.00	2.00	2.00	2.00	2.00	2.00										
30													\$	12.00			
31	Actual Net Capital Expenditure – As Incurred (\$m Real 2003-04)																
32	Year	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14					
33	Total	100.00	103.88	55.65	86.62	53.64	62.89										
34													\$	462.68			
35	Inflation and Rate of Return																
36	Year	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14					
37	Actual CPI Inflation Rate	3.00%	2.94%	3.44%	1.98%	2.36%	2.98%										
38	Actual CPI (one year lagged)	1.0000	1.0300	1.0603	1.0968	1.1185	1.1449	1.1790	1.1790	1.1790	1.1790	1.1790					
39	Forecast Inflation Rate	2.70%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%					
40	Forecast Inflation Cumulative Index	1.0000	1.0300	1.0609	1.0927	1.1265	1.1653	1.1941	1.2299	1.2668	1.3048	1.3439					
41																	
42	Nominal WACC	8.86%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%					
43	Real WACC	6.00%	6.31%	6.31%	6.31%	6.31%	6.31%	6.31%	6.31%	6.31%	6.31%	6.31%					
44	Nominal WACC																
45	(fixed real time varying)	9.18%	9.44%	9.97%	8.42%	8.82%	9.48%	0.00%	0.00%	0.00%	0.00%	0.00%					

Opening regulatory asset base

The opening RAB is the value of assets on which a return will be earned. The **Input** sheet requires a value for the opening RAB (broken into asset classes) at the start of the final regulatory year of the previous regulatory control period. The RAB will fluctuate each regulatory year to reflect actual capex, asset disposals and regulatory depreciation. Using forecast data as provided for in the RFM, DNSPs should be able to reconcile the calculated RAB values as at the end of the final regulatory year of the previous regulatory control period to those values prescribed in clause S6.2.1(c)(1) of the NER.

The recorded input values are linked to subsequent sheets that calculate a running balance of the RAB for the regulatory control period. Notes have also been included for various cells with specific comments and explanations on the relevance of the inputs.

³ The full as-incurred method for recognising capex calculates the return on capital and the return of capital (depreciation) from when expenditure is incurred.

Asset class name

The asset classes/names are recorded in column G. It is important that the asset classes recorded in the RAB section match the asset classes identified in the capex section. This allows the RFM to model consistent depreciation across the asset classes.

The RFM is configured to accommodate up to 30 asset classes.⁴ The number of asset classes used in the RFM will vary between businesses. However, for each business, the asset classes (as well as asset lives and other parameters) used in the RFM must be consistent with the asset classes used in the PTRM that forms part of the distribution determination for that regulatory control period. This is required by clause 6.5.5(b)(3) of the NER, and ensures that the capex incentive framework for each distribution determination is maintained.

RAB values by asset class derived from the RFM may be aggregated or disaggregated into different classes when forming inputs for the PTRM for the subsequent regulatory control period where this demonstrably improves the accuracy or administrative convenience of asset calculations.

Opening asset value

The opening asset values for each asset class for the final regulatory year of the previous regulatory control period are recorded in column J.

Remaining life

The remaining life of the asset classes are recorded in column K, based on the economic life of the assets as at the start of the current regulatory control period. These values must accord with those used in the previous distribution determination.⁵

Standard life

The standard life of the assets is recorded in column L. It measures how long the infrastructure would physically last if it had just been built. These values must accord with those used in the previous distribution determination.

Forecast net capex

The forecast net capex for each asset class is recorded in column M. It is based on the forecast made in the final regulatory year of the previous regulatory control period. These values would be contained in the modelling used for the previous distribution determination. The forecast net capex values are linked to the **Adjustment for previous period** sheet.

⁴ The RFM can be expanded to accommodate additional asset classes, when necessary.

⁵ References to a 'previous distribution determination' include any pass-through determinations.

Forecast nominal regulatory depreciation

The forecast nominal regulatory depreciation for each asset class is recorded in column N. It is based on the forecast made for the final regulatory year of the previous regulatory control period. These values would be contained in the modelling used for the previous distribution determination. The forecast nominal regulatory depreciation values are linked to the **Adjustment for previous period** sheet.

Prudent additional capex allowance

The prudent additional capex allowance for each asset class is recorded in column O. This data may be required for DNSPs where the allowance was added to the closing RAB in accordance with incentive arrangements in place during the previous regulatory control period. The amount of prudent additional capex allowance (if any) would be contained in the previous distribution determination. This input data is linked to the **Adjustment for previous period** sheet.

Foregone return on additional capex

The foregone return on additional capex for each asset class is recorded in column P. This data may be required for DNSPs where, in the case of a capex overspend, the foregone return associated with the amount of prudent additional capex allowed in the previous regulatory control period was added to the closing RAB for the previous regulatory control period. The amount of foregone return on additional capex (if any) would be contained in the previous distribution determination. This input data is linked to the **Adjustment for previous period** sheet.

Forecast assets under construction

The forecast value of assets under construction for each asset class during the final regulatory year of the previous regulatory control period is recorded in column Q. This data would be required for DNSPs transitioning to recognising capex from an as-commissioned to an as-incurred approach.⁶ In this case, forecast assets under construction values would have been added to the closing RAB for the previous regulatory control period. The amount of forecast assets under construction (if any) would be contained in the previous distribution determination. The forecast assets under construction values are linked to the **Adjustment for previous period** sheet.

Actual assets under construction

The actual value of assets under construction for each asset class during the final regulatory year of the previous regulatory control period is recorded in column R. This data would be required for DNSPs transitioning to recognising capex from an as-commissioned to an as-incurred approach. These actual assets under construction values are linked to the **Adjustment for previous period** sheet.

⁶ Inputs for actual and forecast assets under construction may not be required.

Tax asset values

The RFM incorporates a mechanism to roll forward tax asset values between regulatory control periods. The **Input** sheet requires the opening tax asset value for each asset class at the start of the final regulatory year of the previous regulatory control period. The RFM is configured to calculate tax asset values using actual capex including the value of contributed assets on an as-incurred basis.

For each asset class, the opening tax value is recorded in column S, the remaining tax asset life is recorded in column T and the standard life for tax purposes is recorded in column U. This input date is linked to the **Tax asset roll forward** sheet to calculate a running balance of the tax asset values for the regulatory control period.

DNSPs transitioning from a pre-tax framework may not be required to perform a tax roll forward calculation. DNSPs may also be required to amend the tax depreciation calculations to align with their preferred approach or transitional requirements.

Base financial year

The financial year for the start of the current regulatory control period is recorded in cell V7.

Actual nominal capital expenditure⁷

The actual capex values for the current regulatory control period (including the final regulatory year for the previous regulatory control period) are recorded for each regulatory year in which expenditure is incurred in rows 41 to 70 (by asset class).

Actual nominal asset disposals

The actual asset disposal values that have taken place over the regulatory control period for each regulatory year are recorded in rows 75 to 104.

Actual customer contributions

The values of actual assets contributed by other parties over the regulatory control period for each year are recorded in rows 109 to 138.

Actual real net capital expenditure

This section on real net capex does not require inputs to be recorded. For each asset class, actual real net capex is calculated based on the recorded nominal capex less asset disposal values and contributed assets, and adjusted for actual inflation. The real net capex values are displayed in rows 143 to 172 and form part of the roll forward of the RAB in the **Adjustment for previous period** and **Actual RAB roll forward** sheets.

⁷ Actual capex, asset disposals and contributions occur evenly over a year and therefore the reported capex values are assumed to be in mid-year terms. All other input values are assumed to be in end of the year terms. It is also acknowledged that forecast or estimated capex, disposals and customer contributions will be required as 'actual' inputs for the final years of the current regulatory control period.

Inflation and rate of return

This section records the actual inflation rates (based on the consumer price index) over the current regulatory control period and in the final regulatory year of the previous regulatory control period. It also records the forecast inflation and the weighted average cost of capital (WACC) rates used in the distribution determinations corresponding to the two regulatory control periods. Each of these parameters is linked to the **Adjustment for previous period** and **Actual RAB roll forward** sheets.

2.2 Adjustment for previous period sheet

The **Adjustment for previous period** sheet adjusts for the final year of the previous regulatory control period the difference between:

- 1) forecast and actual net capex values
- 2) forecast and actual assets under construction values (if any).

These adjustments are consistent with the requirements of clause S6.2.1(c)(2) of the NER, which specifies that a reconciliation includes adjustments to remove any benefit or penalty on the returns associated with any difference between the forecast and actual capex values for the final regulatory year of the previous regulatory control period. In the event that a DNSP's RAB already reflects actual expenditures it should consult with the AER to ensure that the model's inputs are consistent with subsequent calculations.

First, this sheet calculates the difference between forecast and actual net capex for the final regulatory year of the previous regulatory control period, as well as the aggregate compounded return on that difference (rows 11 to 168). This adjustment is made to the closing RAB at the end of the current regulatory control period in the **Total actual RAB roll forward** sheet. This two-step process is outlined in box 1.

Box 1: Adjusting for actual capex in the final year of the previous regulatory control period

1) Calculating the difference between actual and forecast net capex
<p>Nominal actual net capex (including a half-nominal WACC allowance)</p> <p>– Nominal forecast net capex</p> <p>= Nominal difference between actual and forecast net capex (adjusted for lagged actual inflation)</p>
2) Calculating the return on the difference and compounding it for each year of the current regulatory control period
<p>Note:</p> <p>Nominal forecast net capex = forecast net capex allowed in the final year of the previous regulatory control period.</p> <p>Nominal actual net capex = actual net capex incurred during the final year of the previous regulatory control period.</p> <p>Adjustments for lagged actual inflation ensure that the actual net capex is consistent with the forecast net capex in nominal terms. The actual inflation rate is required as an input to cell F6.</p> <p>The return on the difference between actual and forecast net capex is calculated by applying the nominal WACC (adjusted for actual inflation) applicable to the current regulatory control period (as determined in the current distribution determination).</p> <p>Each of these adjustments is made to the final closing RAB for the current regulatory control period in the Total actual RAB roll forward sheet.</p>

Second, this sheet calculates the difference between forecast and actual assets under construction values for the final regulatory year of the previous regulatory control period (if any), as well as the aggregate compounded return on that difference (rows 172 to 329). This adjustment is also made to the closing RAB at the end of the current regulatory control period in the **Total actual RAB roll forward** sheet. This two-step process is outlined in box 2.

Box 2: Adjusting for actual assets under construction in the final regulatory year of the previous regulatory control period

1) Calculating the difference between actual and forecast assets under construction
Nominal actual assets under construction – Nominal forecast assets under construction = Nominal difference between actual and forecast assets under construction
2) Calculating the return on the difference and compounding it for each regulatory year of the current regulatory control period
Note: Forecast assets under construction = forecast assets under construction allowed in the final regulatory year of the previous regulatory control period. Actual assets under construction = actual assets under construction incurred during the final regulatory year of the previous regulatory control period. The return on the difference between actual and forecast assets under construction is calculated by applying the nominal WACC (adjusted for actual inflation) applicable to the current regulatory control period (as determined in the current distribution determination). Each of these adjustments is made to the final closing RAB for the current regulatory control period in the Total actual RAB roll forward sheet.

Finally, this sheet uses the opening RAB for the final regulatory year of the previous regulatory control period to determine the closing RAB for that year by rolling forward for forecast net capex, regulatory depreciation as well as any specific adjustments that may be required as a result of the previous distribution determination (e.g. transition to an as-incurred approach for recognising capex). This adjustment process is set out in box 3. Because inflation during the final regulatory year of the previous regulatory control period is known at the time the previous distribution determination is made, there is no need to make an adjustment in this sheet for actual inflation when rolling forward the RAB to the end of the final regulatory year of the regulatory control period.

Box 3: Adjusting for actual inflation in the final regulatory year of the previous regulatory control period and calculating the opening RAB for the current regulatory control period

Adjusting nominal values for actual inflation	
Opening RAB for the final year of the previous regulatory control period	
+ Forecast net capex	
– Forecast nominal regulatory depreciation	
= Interim closing RAB for the final regulatory year of the previous regulatory control period	
+ Nominal prudent additional capex allowance from the previous regulatory control period (if any)	
+ Nominal foregone return on prudent additional capex allowance from the previous regulatory control period (if any)	
+ Forecast value of assets under construction adjusted for the difference between forecast and actual inflation (if any)	
= Opening RAB for the first regulatory year of the current regulatory control period	
Where:	
Forecast nominal net capex = forecast net capex allowed for the final year of the previous regulatory control period.	
Forecast nominal regulatory depreciation = forecast straight-line depreciation – forecast inflation adjustment on the opening RAB.	
Forecast assets under construction = forecast assets under construction for the final regulatory year of the previous regulatory control period. This may be relevant for some DNSPs transitioning to recognising capex on a partially as-incurred approach.	
The prudent additional capex allowance and the foregone return on that amount are one-off adjustments to the closing RAB for the previous regulatory control period that may be relevant for some DNSPs.	

Figure 2 provides an example of the **Adjustment for previous period** sheet.

Figure 2: Adjustment for previous period sheet

	B	C	D	E	F	G	H	I	J	K	L
2	Adjustments for Previous Regulatory Control Period										
3											
4	Year	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09			
5											
6	Actual CPI Inflation Rate		2.50%	3.00%							
7	Nominal Vanilla WACC (fixed real time varying)				9.44%	9.97%	8.42%	8.82%	9.48%		
8											
9	Nominal Adjustments for Difference Between Forecast and Actual Capex										
10											
11	Nominal Forecast Net Capex (previous regulatory control period)		95.00								
42											
43	Nominal Actual Net Capex		104.49								
74											
75	Nominal Difference Between Actual and Forecast Net Capex		8.98								
106											
107	Compounded Return on Difference - Net Capex				0.85	0.98	0.91	1.03	1.21		
168	<i>Total Return at End of Regulatory Period</i>								4.98		
169											
170	Nominal Adjustments for Difference Between Forecast and Actual Assets Under Construction										
171											
172	Nominal Forecast Assets Under Construction (previous regulatory period)		-								
203											
204	Nominal Actual Assets Under Construction		-								
235											
236	Nominal Difference Between Actual and Forecast Assets Under Constructic		-								
267											
268	Compounded Return on Difference - Assets Under Construction				-	-	-	-	-		
329	<i>Total Return at End of Regulatory Period</i>										
330											
331	Nominal Roll Forward for Final Year of Previous Regulatory Control Period										
332											
333	Nominal Opening Regulated Asset Base		4,800.00	4,895.00							
364											
365	Nominal Forecast Net Capex		95.00								
396											
397	Nominal Forecast Regulatory Depreciation		-								
428											
429	Nominal Prudent Additional Capex Allowance		-								
460											
461	Nominal Foregone Return on Prudent Additional Capex		-								
492											
493	Nominal Forecast Assets Under Construction		-								

Nominal adjustments for difference between forecast and actual capex

This section calculates the difference between forecast and actual capex for the final regulatory year of the previous regulatory control period and determines the compounded return on that difference. The process involved is equivalent to that depicted in box 1.

The nominal forecast net capex for each asset class in the final regulatory year of the previous regulatory control period is displayed in rows 12 to 41. These data are sourced from the **Input** sheet. Row 11 displays the sum of each asset class calculation for rows 12 to 41.

The nominal actual net capex with a half WACC allowance for each asset class in the final regulatory year of the previous regulatory control period is calculated in rows 44 to 73. Given the timing assumption that capex on average takes place halfway through the regulatory year, a half-nominal WACC is applied to the actual net capex for each asset class to ‘gross-up’ the actual values. Row 43 displays the sum of each asset class calculation for rows 44 to 73.

The difference between the actual and forecast net capex values for each asset class is calculated in rows 76 to 105. Row 75 displays the sum of each asset class calculation for those rows.

Finally, in rows 107 to 167 a nominal WACC (row 7) is applied to calculate the return on the difference, which is compounded to the end of the current regulatory control

period.⁸ The total compounded return at the end of the current regulatory control period is displayed in row 168. The values of this return per asset class are linked to the **Total actual RAB roll forward** sheet.

Nominal adjustments for difference between forecast and actual assets under construction

This section calculates the difference between forecast and actual assets under construction values for the final regulatory year of the previous regulatory control period and determines the compounded return on that difference. The process involved is equivalent to that depicted in box 2.

The nominal forecast assets under construction values for each asset class in the final regulatory year of the previous regulatory control period are displayed in rows 173 to 202. These data are sourced from the **Input** sheet. Row 172 displays the sum of each asset class calculations for rows 173 to 202.

The nominal actual assets under construction values for each asset class in the final regulatory year of the previous regulatory control period are displayed in rows 205 to 234. These data are sourced from the **Input** sheet. Row 204 displays the sum of each asset class calculations for rows 205 to 234.

The difference between the actual and forecast assets under construction (adjusted for actual inflation) values for each asset class is calculated in rows 237 to 266. Row 236 displays the sum of each asset class calculations for those rows.

Finally, in rows 268 to 328 a nominal WACC (row 7) is applied to calculate the return on the difference, which is compounded to the end of the current regulatory control period. The total compounded return at the end of the current regulatory control period is displayed in row 329. The values of this return per asset class are linked to the **Total actual RAB roll forward** sheet.

Nominal roll forward for final regulatory year of previous regulatory control period

This section calculates the closing RAB for the final regulatory year of the previous regulatory control period, based on the net capex and regulatory depreciation forecasts for that regulatory year (including any additional adjustments that may be required— e.g. assets under construction, prudent additional capex allowance and foregone return on prudent additional capex). The process involved is equivalent to that depicted in box 3.

The opening RAB for the final regulatory year of the previous regulatory control period (cell G333) is sourced from the **Input** sheet. The sum (cell G365) of the forecast net capex values shown in cells G366 to G395 is rolled into the opening RAB for the final regulatory year of the previous regulatory control period. The sum (cell G397) of the nominal forecast regulatory depreciation values shown in rows 398 to 427 is deducted from the opening RAB for the final regulatory year of the previous

⁸ The nominal WACC is based on a fixed real time varying WACC which is adjusted for actual inflation.

regulatory control period.⁹ This provides an interim closing RAB for the final regulatory year of the current regulatory control period, which becomes the opening RAB for the first regulatory year of the next regulatory control period.

The nominal prudent additional capex allowance from the previous regulatory control period (if any) as well as the foregone return on that amount (if any) are included (rows 429 to 491) as additions to the opening RAB for the first regulatory year of the current regulatory control period. Similarly, the nominal forecast assets under construction (rows 493 to 523) are rolled into the opening RAB for the first regulatory year of the current regulatory control period.

Nominal opening RAB

The nominal opening RAB for the first regulatory year of the current regulatory control period (cell H333) is calculated based on the forecast capex and regulatory depreciation values including any additional adjustments that may be required—e.g. assets under construction, prudent additional capex allowance and foregone return on prudent additional capex. This opening RAB appears again in the **Actual RAB roll forward** sheet so that the roll forward of the RAB can be undertaken for the current regulatory control period.

2.3 Actual RAB roll forward sheet

The **Actual RAB roll forward** sheet calculates the nominal closing RAB (which becomes the opening RAB for the following regulatory year) for each regulatory year of the current regulatory control period. In accordance with clause S6.2.3 of the NER, in rolling forward the RAB from regulatory year to year during the current regulatory control period, the AER will have regard to actual data including actual capex and inflation outcomes. Accordingly, the opening RAB for the first regulatory year of the current regulatory control period is rolled forward for actual net capex (as-incurred) and regulatory depreciation values and adjustments for actual inflation.

It is possible that a DNSP may overspend or underspend the capex allowance during the current regulatory control period. Such variances may be caused by unforeseen increases or decreases in demand, higher than expected costs of construction or forecasting error. The RFM handles such variances by adjusting the closing RAB to reflect the actual capex and actual regulatory depreciation for each regulatory year. On the basis of the incentive framework set out in the NER, there are no additional adjustments in rolling forward the asset base to account for the above/below forecast returns resulting from the over or underspend in the current regulatory control period.

For example, in relation to a lower than forecast capex, the DNSP retains both the returns on and of capital associated with the current regulatory control period. Conversely, in relation to a higher than forecast capex, the DNSP is not compensated for the returns on and of capital foregone associated with the current regulatory control period.

⁹ Nominal regulatory depreciation is based on the nominal straight-line depreciation less the inflation applied to the opening RAB.

The process for rolling forward the RAB from regulatory year to year is set out in box 4.¹⁰

Figure 3 provides an example of the **Actual RAB roll forward sheet**.

Figure 3: Actual RAB roll forward sheet

	C	D	E	F	G	H	I	J	K	L	M
2	Asset Base Roll Forward										
3											
4	Year				2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
5											
6	Actual CPI Inflation Rate				3.00% ¹⁰	2.94%	3.44%	1.98%	2.36%	2.98%	0.00%
7	Actual CPI (one year lagged)				1.0000 ¹⁰	1.0300	1.0603	1.0968	1.1185	1.1449	1.1790
8											
9	Real Asset Values										
10											
11	Real Actual Net Capex					108.67	58.35	90.19	55.96	65.80	-
42											
43	Real Actual Straight-line Depreciation				-	163.67	- 166.63	- 168.57	- 171.11	- 172.95	-
434											
435	Nominal Asset Values										
436											
437	Nominal Opening Regulated Asset Base				4,800.00	4,895.00	4,982.22	5,038.84	5,052.73	5,043.16	5,070.92
468											
469	Nominal Actual Net Capex				95.00	111.93	61.87	98.92	62.59	75.34	-
500											
501	Nominal Actual Regulatory Depreciation				-	- 24.71	- 5.25	- 85.03	- 72.16	- 47.57	-
532											
533	Nominal Prudent Additional Capex Allowance				-						
564											
565	Nominal Foregone Return on Prudent Additional Capex				-						
596											
597	Nominal Forecast Assets Under Construction				-						
628											
629											
630											
631	Nominal Actual Straight-line Depreciation				- 144.00	- 168.58	- 176.67	- 184.88	- 191.38	- 198.01	-
664											
665	Nominal Actual Inflation on Opening RAB				144.00	143.86	171.42	99.85	119.22	150.44	-

¹⁰ Assuming a standard five-year regulatory control period.

Box 4: Rolling forward the RAB in the current regulatory control period

Rolling forward actual net capex and depreciation amounts into the RAB
Opening RAB for regulatory year 1
+ Nominal actual net capex for regulatory year 1
– Nominal actual regulatory depreciation for regulatory year 1
= Closing RAB for regulatory year 1
= Opening RAB for regulatory year 2
+ Nominal actual net capex for regulatory year 2
– Nominal actual regulatory depreciation for regulatory year 2
= Closing RAB for regulatory year 2
= Opening RAB for regulatory year 3
...
= Closing RAB for regulatory year 5
= Interim closing RAB for the current regulatory control period

Where:

Opening RAB for regulatory year 1 = closing RAB for the final regulatory year of the previous regulatory control period, which was calculated in accordance with box 1.

Nominal actual net capex = real actual net capex (including half-nominal WACC allowance) adjusted for actual inflation.

Nominal actual regulatory depreciation = Nominal actual straight-line depreciation – actual inflation adjustment on the opening RAB.

Note: The interim closing RAB for the current regulatory control period becomes the opening RAB for the next regulatory control period after the final adjustments for the previous regulatory control period have been made (these adjustments are included in the **Total actual RAB roll forward** sheet—see box 5 for a description).

Real asset values

Real asset values are displayed in rows 11 to 433. The real actual net capex values (including a half-nominal WACC allowance) for each asset class is displayed in rows 12 to 41.¹¹ Row 11 displays the sum of each asset class calculations for those rows.

These capex values for the current regulatory control period (sourced from the **Input** sheet) are those provided by the DNSPs to the AER for the purpose of rolling forward their asset base at the end of the current regulatory control period.

The real actual straight-line depreciation for each asset class (rows 44 to 433) is calculated based on the opening RAB, actual net capex values and asset lives from the **Input** sheet. Row 43 displays the sum of each asset class calculations for those rows.

¹¹ The half-nominal WACC is based on a fixed real time varying WACC which is adjusted for actual inflation.

Nominal asset values

Nominal asset values are displayed in rows 437 to 695. The nominal opening RAB for each regulatory year is displayed in row 437. The nominal opening RAB for the first regulatory year of the current regulatory control period (cell H437) is the same value as that calculated in the **Adjustment for previous period** sheet in accordance with box 1.

The nominal opening RAB for the remaining regulatory years is calculated in accordance with box 4. The nominal actual net capex for each regulatory year (row 469) is equal to the real actual net capex (row 11) indexed by actual inflation (row 7). The nominal actual regulatory depreciation (row 501) is calculated as nominal actual straight-line depreciation (row 631) less the actual inflation applied to the opening RAB (row 665).

2.4 Total actual RAB roll forward sheet

The **Total actual RAB roll forward** sheet brings together the relevant data from the **Adjustment for previous period** and **Actual RAB roll forward** sheets to calculate the final closing RAB for the current regulatory control period in nominal terms.

In this sheet, row 6 calculates the opening RAB values for each regulatory year of the regulatory control period (which is based on the interim closing RAB in row 198). The calculations are based on data sourced from the **Actual RAB roll forward** sheet. Similarly, the nominal actual net capex (row 38) and regulatory depreciation (row 70) values (including any additional adjustments that may be required—e.g. prudent additional capex allowance (row 102), foregone return on prudent additional capex (row 134) and assets under construction (row 166)) are sourced from the **Actual RAB roll forward** sheet.

Rows 230 to 326 represent the required adjustments based on the final regulatory year of the previous regulatory control period and are sourced from the **Adjustment for previous period** sheet. These adjustments include:

- the difference between forecast and actual capex (and a compounded return on that difference)
- the difference between forecast and actual assets under construction (and a compounded return on that difference).

The process for calculating the final closing RAB for the current regulatory control period is set out in box 5.

Box 5: Adjusting for the final regulatory year of the previous regulatory control period

Calculating the differences between actual net capex and forecast net capex, actual assets under construction and forecast assets under construction, and the compounded return on the differences

Interim closing RAB for the current regulatory control period
+ Difference between nominal actual net capex and forecast nominal net capex (adjusted for actual inflation)
+ Compounded return on that difference for net capex
+ Difference between nominal actual assets under construction and nominal forecast assets under construction (adjusted for actual inflation)
+ Compounded return on that difference for assets under construction
= Final closing RAB for the current regulatory control period
= Opening RAB for the first regulatory year of the next regulatory control period

Note: The opening RAB for the first regulatory year of the next regulatory control period becomes an input into the PTRM for the purposes of determining a revenue cap for the next regulatory control period.

The final closing RAB for the current regulatory control period is shown in cell L358. This value becomes the opening asset base for the next regulatory control period and is used as an input into the PTRM for the purposes of making the next distribution determination. A break down of the final closing RAB by asset classes is displayed in rows 359 to 388.

Figure 4 provides an example of the **Total actual RAB roll forward** sheet.

Figure 4: Total actual RAB roll forward sheet

	C	D	E	F	G	H	I	J	K	L	
2	Total Asset Base Roll Forward										
3											
4	Year	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09				
5											
6	Nominal Opening Regulated Asset Base	4,800.00	4,895.00	4,982.22	5,038.84	5,052.73	5,043.16				
37											
38	Nominal Actual Net Capex	95.00	111.93	61.87	98.92	62.59	75.34				
69											
70	Nominal Actual Regulatory Depreciation	-	24.71	-	5.25	-	85.03	-	72.16	-	47.57
101											
102	Nominal Prudent Additional Capex Allowance	-									
133											
134	Nominal Foregone Return on Prudent Additional Capex	-									
165											
166	Nominal Forecast Assets Under Construction	-									
197											
198	Interim Closing Regulated Asset Base	4,895.00	4,982.22	5,038.84	5,052.73	5,043.16	5,070.92				
229											
230	Difference Between Actual and Forecast Net Capex									8.98	
261											
262	Return on Difference - Net Capex									4.98	
293											
294	Difference Between Actual and Forecast Assets Under Construction									-	
325											
326	Return on Difference - Assets Under Construction									-	
357											
358	Closing Regulated Asset Base								5,084.88		

2.5 Tax value roll forward sheet

The **Tax value roll forward** sheet calculates the nominal opening tax value for each regulatory year of the current regulatory control period by taking the opening tax value for the final regulatory year of the previous regulatory control period and rolling forward for actual net capex and tax depreciation values. Since the calculations are based on actual nominal data the roll forward of the tax values does not require any adjustments for inflation.

The process for rolling forward the tax asset values is set out in box 6.¹²

¹² Assuming a standard five year regulatory control period.

Box 6: Rolling forward the tax asset values

Rolling forward actual net capex and depreciation values into the RAB	
	Opening tax asset value for the final regulatory year of the previous regulatory control period
+	Nominal actual net capex for the final regulatory year of the previous regulatory control period
-	Nominal actual tax depreciation for the final regulatory year of the previous regulatory control period
=	Closing tax asset value for the final regulatory year of the previous regulatory control period
=	Opening tax asset value for regulatory year 1 of the current regulatory control period
+	Nominal actual net capex for regulatory year 1
-	Nominal actual tax depreciation for regulatory year 1
=	Closing tax asset value for regulatory year 1 of the current regulatory control period
=	Opening tax asset value for regulatory year 2 of the current regulatory control period
...	
=	Closing tax asset value for regulatory year 5 of the current regulatory control period
=	Opening tax asset value for the next regulatory control period
Where:	
Nominal actual net capex = nominal actual capex – nominal actual asset disposals.	
Nominal actual tax depreciation = nominal actual straight-line tax depreciation.	
Note: The closing tax asset value for the current regulatory control period becomes the opening tax asset value for the next regulatory control period.	

Figure 5 provides an example of the **Tax value roll forward** sheet.

Figure 5: Tax value roll forward sheet

	B	C	D	E	F	G	H	I	J	K	L	M			
2	Tax Asset Value Roll Forward														
3															
4	Year	2003-04		2004-05		2005-06		2006-07		2007-08		2008-09		2009-10	
5	Nominal Tax Values														
6															
7	Opening Tax Asset Values					4,800.00	4,742.00	4,688.76	4,585.14	4,516.15	4,409.88	4,314.24			
38															
39	Actual Net Capex					102.00	109.00	61.00	97.00	62.00	74.00	-			
70															
71	Actual Tax Depreciation					- 160.00	162.25 -	164.62 -	165.99 -	168.27 -	169.65 -	-			

Opening tax asset values

Rows 8 to 37 roll forward the tax asset values for each asset class by taking the previous regulatory year’s nominal opening tax asset value, then adding nominal actual net capex (as-incurred) and subtracting nominal actual tax depreciation.

Based on the sum of each asset class calculations for those rows, the opening tax asset value for each regulatory year of the regulatory control period is displayed in row 7. These values are calculated in accordance with box 6. The opening tax asset value for

the next regulatory control period is shown in cell M7. This value is used as an input into the PTRM for the purposes of making the next distribution determination.

Actual net capex

Actual net capex for each asset class (rows 39 to 69) is calculated by taking nominal actual capex from the **Input** sheet (rows 41 to 70) and subtracting nominal actual disposals from the same sheet (rows 75 to 104). Note that the resulting capex used for tax purposes includes the value of contributed assets. Row 39 displays the sum of each asset class calculations for rows 40 to 69.

Actual tax depreciation

Actual tax depreciation for each asset class (rows 72 to 491) is calculated based on the nominal opening tax asset values, nominal actual net capex values and tax asset lives, in accordance with the straight-line method. Row 71 displays the sum of each asset class calculations for those rows.