



Final decision

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

September 2007

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## **Amendment record**

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# Contents

<b>Shortened forms .....</b>	<b>iv</b>
<b>1. Nature and authority.....</b>	<b>1</b>
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 .....	1
<b>2. The model.....</b>	<b>2</b>
2.1 Input sheet.....	2
Opening regulated asset base .....	4
Actual nominal capital expenditure—as incurred.....	6
Actual nominal asset disposals—as incurred.....	7
Actual real net capital expenditure—as incurred.....	7
Actual nominal capital expenditure—as commissioned.....	7
Actual nominal asset disposals—as de-commissioned.....	7
Actual real net capital expenditure—as commissioned .....	7
Inflation and rate of return .....	7
2.2 Adjustment for previous period sheet .....	7
Nominal adjustments for difference between forecast and actual capex .....	11
Nominal adjustments for difference between forecast and actual assets under construction.....	12
Nominal roll forward for final year of previous regulatory control period .	13
2.3 Actual RAB roll forward sheet .....	13
Real asset values .....	16
Nominal asset values.....	16
2.4 Total actual RAB roll forward sheet.....	16
2.5 Tax value roll forward sheet .....	18
Opening tax asset values.....	20
Actual net capex.....	20
Actual tax depreciation .....	20

## Shortened forms

AER	Australian Energy Regulator
capex	capital expenditure
CPI	consumer price index
NEL	National Electricity Law
NER	National Electricity Rules
PTRM	net present value
RAB	regulated asset base
RFM	roll forward model
TNSP	transmission network service provider
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) for electricity transmission network service providers (TNSPs). The RFM is a series of Microsoft Excel spreadsheets developed in accordance with the requirements of clause 6A.6.1 of the National Electricity Rules (NER).

## **1.2 Authority**

Clause 6A.6.1(b) of the NER requires the AER to develop and publish the RFM, in accordance with the transmission consultation procedures.

## **1.3 Role of the model**

The RFM will be used by the AER to determine the closing regulated asset base (RAB) for a regulatory control period. The closing RAB value for a regulatory control period as calculated by the RFM becomes the opening RAB to be used for the purposes of making a transmission determination for the next regulatory control period.

## **1.4 Confidentiality**

The AER's obligations regarding confidentiality and the disclosure of information provided to it by a TNSP are governed by the *Trade Practices Act 1974*, 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 in accordance with clause 6A.6.1(c) of the NER and the transmission consultation procedures. A subsequent version of this handbook will accompany each subsequent 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 which perform calculations to derive a closing RAB for the current regulatory control period from a given set of inputs. The RFM allows the user to vary the inputs in order 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 the relevant sheets. Values should be entered into each cell with light blue shading. This sheet has been split into eight sections:

- opening RAB
- actual nominal capital expenditure (capex)—as incurred
- actual nominal asset disposals—as incurred
- actual real net capex—as incurred
- actual nominal capex—as commissioned
- actual nominal asset disposals—as de-commissioned
- actual real net capex—as commissioned
- inflation and rate of return.

The input data to be recorded in the RFM must be in a consistent format as the data collected from TNSPs in accordance with the AER's submission guidelines.

Figure 1 provides an example of the **Input** sheet.

The RFM can handle input data for up to an 11-year period. This includes the final year of the previous regulatory control period, as well as up to 10 years of the current regulatory control period.<sup>1</sup> The RFM can be adjusted to account for regulatory control periods of longer duration.

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<sup>1</sup> For a standard (shorter) regulatory control period, the input spaces which are not required should be left blank or equal to zero.

The RFM is configured to use the straight-line method as the default position for calculating depreciation. TNSPs may propose depreciation profiles other than the straight-line method to be accommodated within the RFM in consultation with the AER as part of pre-lodgement discussions and subject to satisfying the criteria at clause 6A.6.3(b) of the NER.

The RFM is also configured to recognise capex on a partially as-incurred (hybrid) approach as the default position.<sup>2</sup> TNSPs may propose a full as-incurred approach to be accommodated within the RFM in consultation with the AER as part of pre-lodgement discussions.

Figure 1: Input sheet

	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	HHH																
2	Input Variables	Input cells are in blue															
3																	
4																	
5	Opening Regulated Asset Base for 2001-02 (\$m Nominal)																
6		Asset Class Name	Opening Asset Value	Remaining Life	Standard Life	Forecast Net Capex	Forecast Regulatory Depreciation	Prudent Additional Capex 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	Transmission lines	1,000.00	20.0	50.0	40.00	20.00	90.00	-	70.00	72.00	1,000.00	15.0	45.0	2002-03		
8	Asset Class 2	Substations	22.00	15.00	10.00	90.00	8.00	-	-	31.00	31.00	800.00	25.0	35.0			
9	Asset Class 3	Land	600.00	n/a	n/a	-	-	-	-	-	-	600.00	n/a	n/a			
10	Total		2,400.00			40.00	30.00	120.00	-	100.00	103.00						
29	Actual Capital Expenditure – As Incurred (\$m Nominal)																
30	Year	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12					
31	Transmission lines	41.00	50.00	12.00	8.00	15.00	25.00	-	-	-	-	-					
32	Substations	22.00	15.00	10.00	90.00	8.00	10.00	-	-	-	-	-					
33	Land	5.00	7.00	2.00	3.00	6.00	4.00	-	-	-	-	-					
34	Total	68.00	72.00	24.00	61.00	29.00	39.00	-	-	-	-	-					
52													\$ 293.00				
53	Actual Asset Disposal – As Incurred (\$m Nominal)																
54	Year	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12					
55	Transmission lines	10.00	-	-	-	-	-	-	-	-	-	-					
56	Substations	-	5.00	-	-	3.00	2.00	-	-	-	-	-					
57	Land	-	-	-	-	-	-	-	-	-	-	-					
58	Total	-	10.00	5.00	2.00	3.00	2.00	-	-	-	-	-					
76													\$ 22.00				
77	Actual Net Capital Expenditure – As Incurred (\$m Real 2001-02)																
78	Year	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12					
79	Transmission lines	41.00	38.93	11.52	5.47	13.41	21.94	-	-	-	-	-					
80	Substations	22.00	14.56	4.72	45.59	4.47	6.99	-	-	-	-	-					
81	Land	5.00	6.80	1.89	2.74	5.36	3.49	-	-	-	-	-					
82	Total	68.00	60.19	17.92	63.80	23.25	32.32	-	-	-	-	-					
100													\$ 255.47				
101	Actual Capital Expenditure – As Commissioned (\$m Nominal)																
102	Year	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12					
103	Transmission lines	60.00	10.00	70.00	2.00	40.00	-	-	-	-	-	-					
104	Substations	20.00	-	5.00	75.00	3.00	18.00	-	-	-	-	-					
105	Land	5.00	7.00	2.00	3.00	6.00	4.00	-	-	-	-	-					
106	Total	75.00	17.00	77.00	80.00	49.00	22.00	-	-	-	-	-					
124													\$ 320.00				
125	Actual Asset Disposal – As De-commissioned (\$m Nominal)																
126	Year	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12					
127	Transmission lines	5.00	-	-	-	-	-	-	-	-	-	-					
128	Substations	-	5.00	-	-	3.00	2.00	-	-	-	-	-					
129	Land	-	-	-	-	-	-	-	-	-	-	-					
130	Total	-	5.00	5.00	2.00	3.00	2.00	-	-	-	-	-					
148													\$ 17.00				
149	Actual Net Capital Expenditure – As Commissioned (\$m Real 2001-02)																
150	Year	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12					
151	Transmission lines	50.00	4.85	66.02	-	35.76	-	-	-	-	-	-					
152	Substations	20.00	-	69.38	-	13.98	-	-	-	-	-	-					
153	Land	5.00	6.80	1.89	2.74	5.36	3.49	-	-	-	-	-					
154	Total	75.00	11.65	67.91	71.12	41.13	17.47	-	-	-	-	-					
172													\$ 284.27				
173	Inflation and Rate of Return																
174	Year	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12					
175	Actual CPI Inflation Rate	3.00%	2.94%	3.44%	1.98%	2.36%	2.96%	-	-	-	-	-					
176	Actual CPI (one year lagged)	3.00%	1.0300	1.0303	1.0308	1.1185	1.1448	1.1790	1.1790	1.1790	1.1790	1.1790					
177	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%					
178	Forecast Inflation Cumulative Index	1.000%	1.0300	1.0609	1.0927	1.1255	1.1593	1.1941	1.2299	1.2668	1.3048	1.3439					
179																	
180	Nominal Vanilla WACC	8.86%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%	9.50%					
181	Real Vanilla WACC	6.00%	6.31%	6.31%	6.31%	6.31%	6.31%	6.31%	6.31%	6.31%	6.31%	6.31%					
182	Nominal vanilla WACC (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%					

<sup>2</sup> The partially as-incurred method for recognising capex calculates the return on capital based on an as-incurred approach and the return of capital (depreciation) is based on an as-commissioned approach.

## **Opening regulated 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 year of the previous regulatory control period. The RAB will fluctuate each year to reflect actual capex (as-incurred), asset disposals and regulatory depreciation.

The recorded input values are linked to subsequent sheets which 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.

### **Asset class name**

The asset classes/names are recorded in column G. It is important that the number of asset classes recorded in the RAB section matches the number of 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 20 asset classes.<sup>3</sup> The number of asset classes used in the RFM will vary between businesses. However, for each business, the number of asset classes used in the RFM must be consistent with that used in the AER's post-tax revenue model (PTRM) to allow the closing RAB values determined in the RFM to be used as inputs to the opening RAB values in the PTRM.

### **Opening asset value**

The opening asset values for each asset class 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 should be consistent with those used in the previous revenue determination.

### **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 should be consistent with those used in the previous revenue determination.

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<sup>3</sup> The RFM can be expanded to accommodate additional asset classes, when necessary.



### **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 year of the previous regulatory control period. These values would be contained in the RFM used for the previous revenue determination. The forecast net capex values are linked to the **Adjustment for previous period** sheet.

### **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 year of the previous regulatory period. These values would be contained in the previous RFM—that is, the RFM used for the previous revenue 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 TNSPs where the allowance was added to the closing RAB for the previous regulatory control period. The amount of prudent additional capex allowance (if any) would be contained in the previous RFM. 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 TNSPs 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 RFM. 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 year of the previous regulatory control period is recorded in column Q. This data may be required for TNSPs transitioning to recognising capex on a partially as-incurred approach. 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 RFM.<sup>4</sup> The forecast assets under construction values are linked to the **Adjustment for previous period** sheet.

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<sup>4</sup> Alternatively, the forecast assets under construction values may be obtained from the opening asset base input in the PTRM used for the previous revenue determination.

### **Actual assets under construction**

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

### **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 year of the previous regulatory control period. The tax asset values will fluctuate each year to reflect actual capex (as-commissioned), asset disposals and tax depreciation.

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 data is linked to the **Tax asset roll forward** sheet to calculate a running balance of the tax asset values for the regulatory control period.

### **Base financial year**

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

### **Actual nominal capital expenditure—as incurred<sup>5</sup>**

The actual capex (as-incurred) values for the current regulatory control period (including the final year for the previous regulatory control period) are recorded for each year in rows 31 to 50 (by asset class). Generally, capex falls into three broad categories:

- asset augmentation (e.g. works to enlarge a network or to increase the capability of a network).
- asset replacement (e.g. replacing assets that have passed their useful lives)
- non-network asset (e.g. support the business expenditure)

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<sup>5</sup> Actual capex and actual asset disposals are undertaken evenly over a year and therefore the reported capex values are assumed to be in middle of the year terms. All other input values are assumed to be in end of the year terms.

### **Actual nominal asset disposals—as incurred**

The actual asset disposal values that have taken place over the regulatory control period for each year are recorded in rows 55 to 74.

### **Actual real net capital expenditure—as incurred**

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 adjusted for actual inflation. The real net capex (as-incurred) values are displayed in rows 79 to 98 and form part of the roll forward of the RAB in the **Adjustment for previous period** and **Actual RAB roll forward** sheets.

### **Actual nominal capital expenditure—as commissioned**

The actual capex (as-commissioned) values are recorded for each year in rows 103 to 122.

### **Actual nominal asset disposals—as de-commissioned**

The actual de-commissioned asset values are recorded for each year in rows 127 to 146.

### **Actual real net capital expenditure—as commissioned**

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 the value of de-commissioned assets, and adjusted for actual inflation. The real net capex (as-commissioned) values are displayed in rows 151 to 170 and are used to calculate depreciation in the **Actual RAB roll forward** sheet.

### **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 year of the previous regulatory control period. It also records the forecast inflation and WACC rates used in the revenue 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 S6A.2.1 of the NER, which specifies that a reconciliation would include adjustments that remove any

benefit or penalty on the returns associated with any difference between the forecast and actual capex values for the final year of the previous regulatory control period.

First, this sheet calculates the difference between forecast and actual net capex for the final year of the previous regulatory control period, as well as the aggregate compounded return on that difference (rows 11 to 118). 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**

<b>1) Calculating the difference between actual and forecast net capex</b>
<p>Nominal actual net capex (including a half-nominal vanilla WACC allowance)          – Nominal forecast net capex          = Nominal difference between actual and forecast net capex (adjusted for lagged actual inflation)</p>
<b>2) Calculating the return on the difference and compounding it for each year of the current regulatory control period</b>
<p>Note:</p> <ul style="list-style-type: none"> <li>▪ Nominal forecast net capex = forecast net capex allowed in the final year of the previous regulatory control period.</li> <li>▪ Nominal actual net capex = actual net capex incurred during the final year of the previous regulatory control period.</li> <li>▪ Adjustments for lagged actual inflation are to 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.</li> <li>▪ The return on the difference between actual and forecast net capex is calculated by applying the nominal vanilla WACC (adjusted for actual inflation) applicable to the current regulatory control period (as determined in the current revenue cap decision).</li> <li>▪ Each of these adjustments is made to the final closing RAB for the current regulatory control period in the <b>Total actual RAB roll forward</b> sheet.</li> </ul>

Second, this sheet calculates the difference between forecast and actual assets under construction values for the final year of the previous regulatory control period, as well as the aggregate compounded return on that difference (rows 122 to 229). 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 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 year of the current regulatory control period**

Note:

- Forecast assets under construction = forecast assets under construction allowed in the final year of the previous regulatory control period.
- Actual assets under construction = actual assets under construction incurred during the final 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 vanilla WACC (adjusted for actual inflation) applicable to the current regulatory period (as determined in the current revenue cap decision).
- Each of these adjustments is made to the final closing RAB for the current regulatory period in the **Total actual RAB roll forward** sheet.

Finally, this sheet uses the opening RAB for the final year of the previous regulatory control period then rolling forward for forecast net capex, regulatory depreciation as well as any specific adjustments that may be required as a result of the previous revenue determination (e.g. transition to a partially as-incurred approach for recognising capex (rows 299 to 363) to determine the closing RAB for that year. This adjustment process is set out in box 3. Because inflation during the final year of the previous regulatory control period is known at the time the previous revenue 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 year of the regulatory control period.

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

<b>Adjusting nominal values for actual inflation</b>
<p><b>Opening RAB for the final year of the previous regulatory control period</b></p> <p>+ Forecast net capex</p> <p>– Forecast nominal regulatory depreciation</p> <p><b>= Interim closing RAB for the final year of the previous regulatory control period</b></p>
<p>+ Nominal prudent additional capex allowance from the previous regulatory control period (if any)</p> <p>+ Nominal foregone return on prudent additional capex allowance from the previous regulatory control period (if any)</p> <p>+ Forecast value of assets under construction adjusted for the difference between forecast and actual inflation (if any)</p> <p><b>= Opening RAB for the first year of the current regulatory control period</b></p>
<p>Where:</p> <ul style="list-style-type: none"> <li>▪ Forecast nominal net capex = forecast net capex allowed for the final year of the previous regulatory control period.</li> <li>▪ Forecast nominal regulatory depreciation = forecast straight-line depreciation – forecast inflation adjustment on the opening RAB.</li> <li>▪ Forecast assets under construction = forecast assets under construction for the final year of the previous regulatory control period. This may be relevant for some TNSPs transitioning to recognising capex on a partially as-incurred approach.</li> <li>▪ 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 TNSPs.</li> </ul>

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

**Figure 2: Adjustment for previous period sheet**

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2		<b>Adjustments for Previous Regulatory Control Period</b>										
3												
4		<b>Year</b>				<b>2000-01</b>	<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>
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		<b>Nominal Adjustments for Difference Between Forecast and Actual Capex</b>										
10												
11		Nominal Forecast Net Capex (previous regulatory control period)				40.00						
12												
13		Nominal Actual Net Capex				71.05						
14												
15		Nominal Difference Between Actual and Forecast Net Capex				30.71						
16												
17		Compounded Return on Difference - Net Capex						2.90	3.35	3.11	3.53	4.13
18		<i>Total Return at End of Regulatory Period</i>										17.02
19												
20		<b>Nominal Adjustments for Difference Between Forecast and Actual Assets Under Construction</b>										
21												
22		Nominal Forecast Assets Under Construction (previous regulatory period)				100.00						
23												
24		Nominal Actual Assets Under Construction				103.00						
25												
26		Nominal Difference Between Actual and Forecast Assets Under Construct				3.00						
27												
28		Compounded Return on Difference - Assets Under Construction						0.28	0.33	0.30	0.35	0.40
29		<i>Total Return at End of Regulatory Period</i>										1.66
30												
31		<b>Nominal Roll Forward for Final Year of Previous Regulatory Control Period</b>										
32												
33		Nominal Opening Regulated Asset Base				2,400.00		2,630.00				
34												
35		Nominal Forecast Net Capex				40.00						
36												
37		Nominal Forecast Regulatory Depreciation				-	30.00					
38												
39		Nominal Prudent Additional Capex Allowance					120.00					
40												
41		Nominal Foregone Return on Prudent Additional Capex					-					
42												
43		Nominal Forecast Assets Under Construction					100.00					
44												

### Nominal adjustments for difference between forecast and actual capex

This section calculates the difference between forecast and actual capex for the final 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 year of the previous regulatory control period is displayed in rows 12 to 31. This data is sourced from the **Input** sheet. Row 11 displays the sum of each asset class calculations for rows 12 to 31.

The nominal actual net capex with a half WACC allowance for each asset class in the final year of the previous regulatory control period is calculated in rows 34 to 53. Given the timing assumption that capex on average takes place halfway through the year, a half-nominal vanilla WACC is applied to the actual net capex for each asset

class to ‘gross-up’ the actual values.<sup>6</sup> Row 33 displays the sum of each asset class calculations for rows 34 to 53.

The difference between the actual and forecast net capex values for each asset class is calculated in rows 56 to 75. Row 55 displays the sum of each asset class calculations for those rows.

Finally, in rows 77 to 117 a nominal vanilla WACC (row 7) is applied to calculate the return on the difference, which is compounded to the end of the current regulatory control period.<sup>7</sup> The total compounded return at the end of the current regulatory control period is displayed in row 118. This value is 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 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 year of the previous regulatory control period are displayed in rows 123 to 142. This data is sourced from the **Input** sheet. Row 122 displays the sum of each asset class calculations for rows 123 to 142.

The nominal actual assets under construction values for each asset class in the final year of the previous regulatory control period are displayed in rows 145 to 164. This data is sourced from the **Input** sheet. Row 144 displays the sum of each asset class calculations for rows 145 to 164.

The difference between the actual and forecast assets under construction (adjusted for actual inflation) values for each asset class is calculated in rows 167 to 186. Row 166 displays the sum of each asset class calculations for those rows.

Finally, in rows 188 to 228 a nominal vanilla 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 229. This value is linked to the **Total actual RAB roll forward** sheet.

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<sup>6</sup> AER, *Roll forward model: Final decision*, September 2007. See section 4.3.1 which discusses the need for the application of a half-nominal WACC allowance.

<sup>7</sup> The nominal vanilla WACC is based on a fixed real time varying WACC—that is, adjusted for actual inflation.



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

This section calculates the closing RAB for the final year of the previous regulatory control period, based on the net capex and regulatory depreciation forecasts for that 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 year of the previous regulatory control period (cell C233) is sourced from the **Input** sheet. The sum (cell G255) of the forecast net capex values shown in cells G256 to G275 is rolled into the opening RAB for the final year of the previous regulatory control period. The sum (cell G277) of the nominal forecast regulatory depreciation values shown in rows 278 to 297 is deducted from the opening RAB for the final year of the previous regulatory control period.<sup>8</sup> This then provides an interim closing RAB for the final year of the current regulatory control period, which becomes the opening RAB for the first 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 299 to 341) as additions to the opening RAB for the first year of the current regulatory control period. Similarly, the nominal forecast assets under construction (rows 343 to 363) are rolled into the opening RAB for the first year of the current regulatory control period.

### Nominal opening RAB

The nominal opening RAB for the first year of the current regulatory control period (cell H233) 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 each year of the current regulatory control period. Under clause S6A.2.1 of the NER, in rolling forward the RAB from year to year during the current regulatory control period, the AER must have regard to actual data such as capex and inflation outcomes. Accordingly, the opening RAB for the first year

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<sup>8</sup> Nominal regulatory depreciation is based on the nominal straight-line depreciation less the inflation applied to the opening RAB.

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 TNSP 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 the year. On the basis of the incentive framework set out in chapter 6A of the NER, there is 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 TNSP 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 TNSP is not compensated for the returns on and of capital foregone associated with the current regulatory control period.

The process for rolling forward the RAB from year to year is set out in box 4.<sup>9</sup>

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

**Figure 3: Actual RAB roll forward sheet**

A	B	C	D	E	F	G	H	I	J	K	L	M
1												
2		<b>Asset Base Roll Forward</b>										
3												
4		<b>Year</b>				<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>
5												
6		Actual CPI Inflation Rate				3.00%	2.94%	3.44%	1.98%	2.36%	2.98%	0.00%
7		Actual CPI (one year lagged)				1.0000	1.0300	1.0603	1.0968	1.1185	1.1449	1.1790
8												
9		<b>Real Asset Values</b>										
10												
11		Real Actual Net Capex					62.97	18.79	56.01	24.25	33.82	-
32												
33		Real Actual Straight-line Depreciation					- 87.33	- 87.43	- 88.82	- 90.60	- 91.35	-
294												
295		<b>Nominal Asset Values</b>										
296												
297		Nominal Opening Regulated Asset Base				2,400.00	2,630.00	2,682.20	2,701.71	2,719.26	2,709.21	2,724.16
318												
319		Nominal Actual Net Capex				40.00	64.86	19.92	61.43	27.12	38.71	-
340												
341		Nominal Actual Regulatory Depreciation				- 30.00	- 12.66	- 0.42	- 43.88	- 37.17	- 23.76	-
362												
363		Nominal Prudent Additional Capex Allowance				120.00						
384												
385		Nominal Foregone Return on Prudent Additional Capex				-						
406												
407		Nominal Forecast Assets Under Construction				100.00						
428												
429												
430												
431		Nominal Actual Straight-line Depreciation				- 102.00	- 89.95	- 92.70	- 97.41	- 101.33	- 104.58	-
452												
453		Nominal Actual Inflation on Opening RAB				72.00	77.29	92.29	53.54	64.16	80.82	-
474												

<sup>9</sup> 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 year 1

- + Nominal actual net capex for year 1
- Nominal actual regulatory depreciation for year 1

= **Closing RAB for year 1**

= **Opening RAB for year 2**

- + Nominal actual net capex for year 2
- Nominal actual regulatory depreciation for year 2

= **Closing RAB for year 2**

= **Opening RAB for year 3**

...

= **Closing RAB for year 5**

= **Interim closing RAB for the current regulatory control period**

Where:

- Opening RAB for year 1 = closing RAB for the final 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 vanilla 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 period becomes the opening RAB for the next regulatory 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 4 for a description).

## Real asset values

Real asset values are displayed in rows 11 to 293. The real actual net capex values (including a half-nominal vanilla WACC allowance) for each asset class is displayed in rows 12 to 31.<sup>10</sup> Row 11 displays the sum of each asset class calculations for those rows.

These capex (as-incurred) values for the current regulatory control period (sourced from the **Input** sheet) are those provided by the TNSPs 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 34 to 293) is calculated based on the opening RAB, actual net capex (as-commissioned) values and asset lives from the **Input** sheet. Row 33 displays the sum of each asset class calculations for those rows.

## Nominal asset values

Nominal asset values are displayed in rows 297 to 473. The nominal opening RAB for each year is displayed in row 297. The nominal opening RAB for the first year of the current regulatory control period (cell G297) 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 years is calculated in accordance with box 4. The nominal actual net capex for each year (row 319) is equal to the real actual net capex (row 11) indexed by actual inflation (row 7). The nominal actual regulatory depreciation (row 341) is calculated as nominal actual straight-line depreciation (row 431) less the actual inflation applied to the opening RAB (row 453).

## 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 year of the regulatory control period (which is based on the interim closing RAB in row 138). The calculations are based on data sourced from the **Actual RAB roll forward** sheet. Similarly, the nominal actual net capex (row 28) and regulatory depreciation (row 50) values (including any additional adjustments that may be required—e.g. prudent additional capex allowance (row 72), foregone return on prudent additional capex

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<sup>10</sup> The half-nominal vanilla WACC is based on a fixed real time varying WACC—that is, adjusted for actual inflation.

(row 94) and assets under construction (row 116)) are sourced from the **Actual RAB roll forward** sheet .

Rows 160 to 246 represent the required adjustments based on the final 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 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 year of the next regulatory control period**

Note:

- The opening RAB for the first 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 L248. 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 revenue determination. A break down of the final closing RAB by asset classes is displayed in rows 249 to 268.

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

**Figure 4: Total actual RAB roll forward sheet**

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2			<b>Total Asset Base Roll Forward</b>									
3												
4			<b>Year</b>				<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>
5												
6			Nominal Opening Regulated Asset Base				2,400.00	2,630.00	2,682.20	2,701.71	2,719.26	2,709.21
27												
28			Nominal Actual Net Capex				40.00	64.86	19.92	61.43	27.12	38.71
49												
50			Nominal Actual Regulatory Depreciation			-	30.00	12.66	-	0.42	-	23.76
71												
72			Nominal Prudent Additional Capex Allowance				120.00					
93												
94			Nominal Foregone Return on Prudent Additional Capex				-					
115												
116			Nominal Forecast Assets Under Construction				100.00					
137												
138			<b>Interim Closing Regulated Asset Base</b>				<b>2,630.00</b>	<b>2,682.20</b>	<b>2,701.71</b>	<b>2,719.26</b>	<b>2,709.21</b>	<b>2,724.16</b>
159												
160			Difference Between Actual and Forecast Net Capex									30.71
181												
182			Return on Difference - Net Capex									17.02
203												
204			Difference Between Actual and Forecast Assets Under Construction									3.00
225												
226			Return on Difference - Assets Under Construction									1.66
247												
248			<b>Closing Regulated Asset Base</b>									<b>2,776.56</b>
269												

## 2.5 Tax value roll forward sheet

The **Tax value roll forward** sheet calculates the nominal opening tax value for each year of the current regulatory control period by taking the opening tax value for the final year of the previous regulatory control period and rolling forward for actual net capex (as-commissioned) 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.<sup>11</sup>

<sup>11</sup> Assuming a standard five-year regulatory control period.

**Box 6: Rolling forward the tax asset values**

<b>Rolling forward actual net capex and depreciation values into the RAB</b>	
	<b>Opening tax asset value for the final year of the previous regulatory control period</b>
+	Nominal actual net capex for the final year of the previous regulatory control period
-	Nominal actual tax depreciation for the final year of the previous regulatory control period
=	<b>Closing tax asset value for the final year of the previous regulatory control period</b>
=	<b>Opening tax asset value for year 1 of the next regulatory control period</b>
+	Nominal actual net capex for year 1
-	Nominal actual tax depreciation for year 1
=	<b>Closing tax asset value for year 1 of the next regulatory control period</b>
=	<b>Opening tax asset value for year 2 of the next regulatory control period</b>
...	
=	<b>Closing tax asset value for year 5 of the next regulatory control period</b>
=	<b>Opening tax asset value for the next regulatory control period</b>
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**

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2		<b>Tax Asset Value Roll Forward</b>											
3													
4		<b>Year</b>					2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
5		<b>Nominal Tax Values</b>											
6													
7		Opening Tax Asset Values					2,400.00	2,376.33	2,287.98	2,259.52	2,236.95	2,180.24	2,096.63
28													
29		Actual Net Capex					75.00	12.00	72.00	78.00	46.00	20.00	-
50													
51		Actual Tax Depreciation					- 98.67	- 100.35	- 100.46	- 100.57	- 102.71	- 103.60	-
332													

## **Opening tax asset values**

Rows 8 to 27 roll forward the tax asset values for each asset class by taking the previous year's nominal opening tax asset value, then adding nominal actual net capex (as-commissioned) 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 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 revenue determination.

## **Actual net capex**

Actual net capex for each asset class (rows 29 to 49) is calculated by taking nominal actual capex (as-commissioned) from the **Input** sheet (rows 103 to 123) and subtracting nominal actual de-commissioned assets from the same sheet (rows 127 to 147). Row 29 displays the sum of each asset class calculations for rows 28 to 49.

## **Actual tax depreciation**

Actual tax depreciation for each asset class (rows 52 to 331) is calculated based on the nominal opening tax asset values, nominal actual net capex (as-commissioned) values and tax asset lives, in accordance with the straight-line method. Row 51 displays the sum of each asset class calculations for those rows.