EBSS Mechanism for Bottom Up Costs

Memorandum

To:	TransGrid
From:	Jeff Balchin
Date:	15 May 2014
Subject:	EBSS mechanism for operating costs that are forecast on a bottom-up basis

1. Introduction and overview

1.1 Purpose

The purpose of this memorandum is to advise TransGrid as to how lumpy categories of operating expenditure (principally major operational refurbishment) should be treated when developing its forecasts and the implications for the efficiency benefit sharing scheme (EBSS) for this category of expenditure.

A characteristic of this expenditure is that is comprised of relatively large, discreet projects, and with the volumes of such works varying materially year-on-year and between successive regulatory periods. As a consequence, the "base year + (very narrowly applied) step + (exogenous) trend" method of forecasting creates the potential for windfall losses or gains depending upon whether the volumes of such works are expected to increase or reduce in future periods compared to the current period.

1.2 Summary of advice

1.2.1 Forecasting method and consistent EBSS

The method that is used to forecast operating expenditure needs to be consistent with the form of the efficiency benefit sharing scheme (EBSS) that applies. The EBSS is the method that is used to measure the efficiency gains or losses that an NSP makes in a given regulatory period and ensure the NSP bears 30 per cent of the gain or loss, with the remaining 70 per cent passing to customers.

We recommend that TransGrid forecast its major operational refurbishment expenditure on a bottom-up basis for the next regulatory period. We note, however, that this forecasting method means that there is no link between the actual expenditure in the base year and the forecasts generated for the next period, in turn implying that the efficiency gain or loss that is made in a particular regulatory period in relation to this category of expenditure will comprise only of the difference between actual and forecast expenditure in that period.[1] Accordingly, we recommend that a revised version of the EBSS be adopted that is consistent with efficiency gains and losses being defined as the difference between forecast and actual expenditure in one regulatory period.

[1] As discussed further below, the standard EBSS assumes that the expenditure in the base year (i.e., at the end of one regulatory period) translates mechanically into the forecasts for the next regulatory period. This means that the efficiency gains or losses from under or overspending are much higher because there is a continuing effect into the next regulatory period.

The simplest EBSS for delivering the target sharing of efficiency gains or losses defined in this manner between the NSP and customers is for the NSP's underspend or overspend in each year of the current regulatory period to be reversed six years later, with this reversal forming the EBSS for the next regulatory period. The operation of this EBSS for a hypothetical example is shown in Figure 1 below.[2] This figure assumes a hypothetical, lumpy operating expenditure allowance for the second regulatory period, and that this amount is spent during the next period.

Figure 1 – EBSS consistent with "bottom up" forecasts

Year	1	2	3	4	5	6	7	8	9	10	11
Regulatory allowance (= bottom up forecast)	100	100	100	100	100	105	110	90	120	85	
Actual operating expenditure	98	101	90	94	97	105	110	90	120	85	
Underspend / overspend	2	-1	10	6	3	0	0	0	0	0	
EBSS						**0**	**-2**	**1**	**-10**	**-6**	**-3**

1.2.2 Consistency with the AER's suggested approach to lumpy operating expenditure

The AER has proposed an alternative method for operating expenditure forecasts to be based upon bottom-up forecasts, but with the information from the bottom-up forecasts used in a manner that is consistent with the standard EBSS. Separately to this, the AER has also proposed to allow NSPs to, in effect, transfer amounts (either positive or negative) from the EBSS to the new expenditure forecast in a manner that is revenue neutral. The objective here is to allow the expenditure forecasts to reflect the expected expenditure, and so assisting with the monitoring of the performance of NSPs.

We observe that if both of these proposals are adopted, then the outcome will be identical to the mechanism that we propose above, namely applying the bottom-up forecast as the new regulatory allowance and calculating the EBSS as a simple reversal of amounts after a 6 year period. The first figure below shows the effect of the AER's proposed method for applying bottom up forecasts with the EBSS and with the new regulatory allowance derived in the manner the AER proposes (Figure 2), and the second figure shows the effect of transferring amounts from the EBSS to the operating expenditure allowance (Figure 3), in this case the EBSS is reduced by 6 per annum and the operating expenditure allowance is raised by a corresponding amount (thus not changing the overall revenue requirement).[3] Both of these figures again assume a hypothetical, lumpy operating expenditure allowance for the second regulatory period that matches what is spent. It is noted that in both figures, the net outcome for the NSP will be the same as under the mechanism that we propose, and that the regulatory allowance for operating expenditure and the EBSS in the second figure matches precisely what we propose.

2 This form of the EBSS only requires information on year 4 to be available at the time of the regulatory determination because any under or overspending in respect of year 5 will flow into the EBSS for the subsequent regulatory period.

3 The outcomes of the calculations are shown here. The derivation of these outcomes are set out in Section 2.3.

Figure 2 – Adjusted "bottom up" forecasts and standard EBSS

Year	1	2	3	4	5	6	7	8	9	10	11
Bottom up forecast						105	110	90	120	85	
Regulatory allowance	100	100	100	100	100	99	104	84	114	79	
Actual operating expenditure	98	101	90	94	97	105	110	90	120	85	
EBSS						6	4	7	-4	0	
Underspending / overspending in second regulatory period						-6	-6	-6	-6	-6	-3
Net gain / loss during second (and third) regulatory periods						**0**	**-2**	**1**	**-10**	**-6**	**-3**

Figure 3 – Adjusted "bottom up" forecasts and standard EBSS and transfer of amounts between the EBSS and the expenditure allowance

Year	1	2	3	4	5	6	7	8	9	10	11
Bottom up forecast						105	110	90	120	85	
Regulatory allowance	100	100	100	100	100	105	110	90	120	85	
Actual operating expenditure	98	101	90	94	97	105	110	90	120	85	
EBSS						0	-2	1	-10	-6	
Underspending / overspending in second regulatory period						0	0	0	0	0	-3
Net gain / loss during second (and third) regulatory periods						**0**	**-2**	**1**	**-10**	**-6**	**-3**

2. Further analysis

2.1 Need for consistency between the forecasting method and the EBSS

A key issue for the proposal of an alternative method of forecasting is that the form of the EBSS and the forecasting method need to be decided jointly, and more specifically it is the EBSS that is applied in respect of the *last period* that needs to be consistent with the forecasting method that is applied in respect of the *next period*. The reason for this is because what is measured as the efficiency gain or loss for a particular period – which is then shared with customers – depends upon how the forecast for the next period is derived.

- If the actual expenditure at the end of one period is assumed to translate mechanically into forecasts for the next period then the measured efficiency gain or loss in the first period will comprise (i) the difference between forecast and actual expenditure in the first period, plus (ii) the continuing effect of the difference between forecast and actual expenditure on the forecast of operating expenditure in the next period.

- If, however, there is no link between expenditure in one period and the forecast in the next period, then the measured efficiency gain will comprise just the first of the two elements above (that is, the difference between forecast and actual expenditure).

The standard EBSS is based upon the assumption that actual operating expenditure in one regulatory period flows mechanically into the forecasts in the next period. By way of comparison, the new incentive arrangements for capital expenditure assume that the forecasts for the next period are independent of an NSP's actual expenditure in the last period.

The AER's preferred "base + step + trend" method of forecasting operating expenditure results in a mechanical link between actual operating expenditure and the new forecast and so is consistent with the standard EBSS. However, if the new operating expenditure allowances are derived on the basis of bottom up forecasts then either (i) a modified EBSS is required, or (ii) the bottom up forecasts must be adjusted so that the new operating expenditure allowance is consistent with the standard EBSS.

2.2 Our proposal – apply the bottom up forecasts and adopt a modified EBSS

The standard EBSS when applied in conjunction with the "base + (narrowly defined) step + (exogenous) trend" forecasting method performs two roles, which are to:

- *Correct for the share of the "last period" gain or loss* – the NSP bears 100 per cent of under or overspending during the regulatory period, whereas the intention is that this gain or loss be shared with customers (in the ratio of approximately 30 per cent : 70 per cent). The intended sharing is restored by creating a reversal of the gain or loss six years after the initial gain or loss (the six year gap means that, in present value terms, 30 per cent is borne).

- *Providing a share of the continuing effect of the expenditure levels* – as the actual expenditure at the end of one regulatory period will have a direct effect on the forecast in the next period, the gains or losses in one period will have a continuing effect into the next regulatory period. The EBSS also provides the NSP with the target 30 per cent share of this continuing gain or loss.

The following simple example shows the standard EBSS calculation for dummy figures and demonstrates its decomposition into these elements.

Figure 4 – Decomposition of the standard EBSS

Year	1	2	3	4	5	6	7	8	9	10	11
Regulatory allowance	100	100	100	100	100						
Actual operating expenditure	98	97	99	96	95						
Underspend / overspend	2	3	1	4	5						
Incremental underspend / overspend	2	1	-2	3	1						
EBSS Yr 1	*2*	*2*	*2*	*2*	*2*	*2*					
EBSS Yr 2		*1*	*1*	*1*	*1*	*1*	*1*				
EBSS Yr 3			*-2*	*-2*	*-2*	*-2*	*-2*	*-2*			
EBSS Yr 4				*3*	*3*	*3*	*3*	*3*	*3*		
EBSS Yr 5					*1*	*1*	*1*	*1*	*1*	*1*	
Standard EBSS						**5**	**3**	**2**	**4**	**1**	**0**
Reversal of underspends / overspends after 6 years							-2	-3	-1	-4	-5
Share of continuing gain or loss						5	5	5	5	5	5
Total of decomposed EBSS						**5**	**3**	**2**	**4**	**1**	**0**

Therefore, if expenditure is to be forecast on a "bottom up" basis and for there to be no continuing effect of gains/losses in one period, then the simplest form of the EBSS that is consistent with this forecasting method and assumption is to retain the first component of the EBSS only – that is, to reverse the under or overspending 6 years after the year in question. The outcome of such a calculation for a hypothetical lumpy operating expenditure profile is shown in Figure 5 below.

Figure 5 – EBSS consistent with "bottom up" forecasts

Year	1	2	3	4	5	6	7	8	9	10	11
Regulatory allowance (= bottom up forecast)	100	100	100	100	100	105	110	90	120	85	
Actual operating expenditure	98	101	90	94	97	105	110	90	120	85	
Underspend / overspend	2	-1	10	6	3	0	0	0	0	0	
EBSS						**0**	**-2**	**1**	**-10**	**-6**	**-3**

It is noted that the information on actual expenditure in year 5 of the first regulatory period will not be required for the regulatory determination for the second regulatory period because any under or overspending in year 5 is "reversed" in the third regulatory period.

2.3 Consistency with the AER model

2.3.1 AER standard method for incorporating bottom up forecasts

The method that is preferred by the AER is to retain the standard EBSS, but to modify how the "bottom up" forecasts are used to derive the operating expenditure forecast. The relevant passage by the AER is as follows:[4]

> *Second, the extra complexity is unnecessary since it is possible to make the current, incremental, form of the EBSS work with bottom up forecasts. This is because it is possible to use bottom up forecasts as part of a single year revealed cost forecast. In this context, a revealed cost forecast simply means taking actual expenditure in the base year, and then adding the incremental change in forecast expenditure over the forecast period. A bottom up forecast could be used to forecast this incremental change. The key is that a revealed cost forecasting approach is adopted and the bottom up forecast is used to set the incremental change in opex rather than the absolute amount.*

Accordingly, the AER's proposed approach is to apply the following steps to derive the operating expenditure forecasts for the next regulatory period:

- First, forecast the actual operating expenditure for the next regulatory period on "bottom up" basis.
- Secondly, calculate the difference between the "bottom up" forecast for each year of the next regulatory period (as above) and the regulatory allowance applied for the last year of the previous regulatory period.
- Thirdly, apply the differences described above to the "revealed" expenditure in the last year of the current regulatory period. In practice, the revealed expenditure for year 5 will be a deemed figure given that information on year 5 expenditure will not be known at the time of the determination. The standard deemed figure is the observed expenditure in the base year (assumed below to be year 4) adjusted on the assumption that there are no further efficiency gains or losses between the base year and the last year. Alternative deemed values for year 5 can be used – this option is discussed in section 2.3.2.

The implication of these calculations is that the new "bottom up" forecast is adjusted downwards or upwards depending by the amount the NSP underspent or overspent in the last year of the first regulatory period.

The operation of the AER's proposed method for the same hypothetical forecast and actual expenditure values used previously is shown in Figure 6 below.

[4] AER, 2013, EBSS Explanatory Statement, November, p.30.

Figure 6 – Adjusted "bottom up" forecasts and standard EBSS

Year	1	2	3	4	5	6	7	8	9	10	11
Bottom up forecast						105	110	90	120	85	
Regulatory allowance	100	100	100	100	100	99	104	84	114	79	
Actual operating expenditure	98	101	90	94	97	105	110	90	120	85	
Deemed final year					94						
Actual / deemed underspend / overspend	2	-1	10	6	6	-6	-6	-6	-6	-6	
Efficiency gain / loss	2	-3	11	-4	0	-3					
EBSS Yr 1	*2*	*2*	*2*	*2*	*2*	*2*					
EBSS Yr 2		*-3*	*-3*	*-3*	*-3*	*-3*	*-3*				
EBSS Yr 3				*11*	*11*	*11*	*11*	*11*			
EBSS Yr 4				*-4*	*-4*	*-4*	*-4*	*-4*	*-4*		
EBSS Yr 5						*0*	*0*	*0*	*0*	*0*	
EBSS Yr 6						*-3*	*-3*	*-3*	*-3*	*-3*	*-3*
EBSS						6	4	7	-4	0	-3
Underspending / overspending in second regulatory period						-6	-6	-6	-6	-6	
Net gain / loss during second (and third) regulatory periods						**0**	**-2**	**1**	**-10**	**-6**	**-3**

As discussed above, the new regulatory allowance commences with the deemed value for year 5 of the current period (94 in the above example), and adds to this the forecast annual change in operating expenditure under the bottom up forecast (the lumpy items, ranging between 120 and 85) compared to the original regulatory allowance for year 5 – thus, for year 6, the allowance is: 94 + (105 – 100) = 99. Compared to our proposal, the NSP (under these hypothetical figures) receives a much higher EBSS, but the regulatory allowance is below the "bottom up" forecast of expenditure by a corresponding amount. The net impact of these two items leaves the NSP in the same position as under the model we propose (compare the last line of Figure 6 with the last line of Figure 5).

2.3.2 A further adjustment – transfer of amounts between the EBSS and regulatory allowance

The AER has also recognised that the outcome of the type above – whereby the regulatory allowance is different to what is expected to be spent because of one-off factors – could create difficulties for monitoring and comparing the financial performance of NSPs. To this end, it has endorsed transferring amounts between the EBSS and the regulatory allowance where desired to improve transparency in a manner that does not affect the overall revenue requirement. The AER's reasoning in this regard was as follows:[5]

> *We consider there should be flexibility in the EBSS to enable revenue to be shifted from the EBSS carryover to the opex allowance to account for non-recurrent efficiency gains in the base year.*
>
> *As a result, we have amended the EBSS to account for any adjustments made to base opex to remove the impacts of one-off factors.*
>
> …
>
> *… in the event a reflective base year is not available, we will adjust the base year to remove the impact of the one-off factor. We will make the commensurate adjustment to the EBSS carryover amounts by calculating the incremental gain in the final year in accordance with*

5 AER, 2013, EBSS Explanatory Statement, November, pp.20-22.

the final year equation above. This would provide a similar revenue outcome to that which would be achieved if the actual base year (with the one-off factor) was used to set the opex forecast in combination with the unadjusted EBSS carryover amounts.

The precise mechanism the AER proposed was to:

- adjust the base year that is used to set the operating expenditure allowance for the next regulatory period, and
- adjust the "deemed" operating expenditure for year 5 by a corresponding amount.

While the AER's discussion in this regard focussed on removing the effects of one-off events in the base year when the "base + step + trend" approach is used to derive the regulatory allowance, the same transparency concern will arise where the new regulatory allowance is set on the basis of a bottom up forecast but is adjusted away from the bottom up forecast.

If the AER's proposed method is applied to increase transparency when using bottom up forecasts, the required outcome would be for the base year to be adjusted so that it is consistent with the original regulatory allowance. This will result in the regulatory allowance for the second regulatory period matching the "bottom up" forecast for that period. The outcome of this adjustment for the hypothetical values assumed in the previous figures is shown in Figure 7 below.

Figure 7 – Adjusted "bottom up" forecasts and standard EBSS and transfer of amounts between the EBSS and the expenditure allowance

Year	1	2	3	4	5	6	7	8	9	10	11
Bottom up forecast						105	110	90	120	85	
Regulatory allowance	100	100	100	100	100	105	110	90	120	85	
Actual operating expenditure	98	101	90	94	97	105	110	90	120	85	
Deemed final year					100						
Actual / deemed underspend / overspend	2	-1	10	6	0	0	0	0	0	0	
Efficiency gain / loss	2	-3	11	-4	-6	-3					
EBSS Yr 1	*2*	*2*	*2*	*2*	*2*	*2*					
EBSS Yr 2		*-3*	*-3*	*-3*	*-3*	*-3*	*-3*				
EBSS Yr 3				*11*	*11*	*11*	*11*	*11*			
EBSS Yr 4				*-4*	*-4*	*-4*	*-4*	*-4*	*-4*		
EBSS Yr 5						*-6*	*-6*	*-6*	*-6*	*-6*	
EBSS Yr 6						*-3*	*-3*	*-3*	*-3*	*-3*	*-3*
EBSS						0	-2	1	-10	-6	-3
Underspending / overspending in second regulatory period						0	0	0	0	0	
Net gain / loss during second (and third) regulatory periods						**0**	**-2**	**1**	**-10**	**-6**	**-3**

The key aspects of this adjustment are that:

- a base year of 100 rather than 94 is used to derive the forecast, in turn resulting in no adjustment to the bottom-up forecasts, and
- the "deemed" expenditure for year 5 is raised from 94 to 100.

It is observed that, after these adjustments:

- the new regulatory allowance is set at the "bottom up" forecast, as discussed above, and

- the EBSS is precisely the same as under the model that we propose.