The WACC adjustment factor for the Gas to the West Pipeline

Final report for Mutual Energy

March 2014

Economic Insight

Report contents

1. Summary

In order to compare applications for the Gas to the West Pipeline on a like-for like basis, a WACC adjustment factor must be calculated to reflect the fact that equity holders will be exposed to opex risk under revenue cap models, but not under cost pass through models.

The Northern Ireland Authority for Utility Regulation has proposed that the appropriate WACC adjustment factor is between 0.09% and 0.53%, with a medium point of 0.22%. Our analysis and evidence gathering, undertaken on behalf of Mutual Energy, suggests that the appropriate WACC adjustment factor is between 0.04% and 0.14%, with a medium point of 0.11%.

We therefore recommend that a figure of 0.11% is applied to the pre-tax WACC of those applications proposing a cost pass-through model.

2. Introduction

The Northern Ireland Executive has approved the subvention of up to £32.5m for the extension of the gas network to the West. Relatedly, the Northern Ireland Authority for Utility Regulation (NIAUR) is overseeing the application process for the award of the license to undertake the extension (and subsequently to operate the pipeline). Given the variety of regulatory models that currently exist in Northern Ireland, the NIAUR is proposing to allow applications on the basis of either:

- the revenue cap model; or
- the opex cost pass-through model.

The complication this raises is that applications under the different models are likely to have differing risk profiles, which makes a like-for-like comparison of license applications challenging. The key issue is that applications under the revenue cap model will implicitly include 'opex risk' within the assumed weighted average cost of capital (WACC), whereas applications under the cost pass-through model will not (and so, all else equal, the WACC associated with any cost pass through model is likely to be lower than that of a revenue cap based model). The NIAUR has therefore identified that it would be appropriate to make an upwards adjustment to the WACC associated with any cost pass-through application to reflect the difference in risk profile, so that applications are compared on a fair basis.

In practice, precisely identifying the appropriate WACC adjustment factor is challenging. This is because one is ultimately attempting to isolate the equity risk within a WACC solely arising from opex variance. However, the WACC captures a wide spectrum of risks, including:

- capex risk;
- volume risk;
- financing risk;
- regulatory risk;
- stranding risk; and
- the risk associated with divergences between actual and allowed opex.

Given the above, appropriate methodologies for identifying opex related equity risk would seem to depend on the benchmarking of key parameters using comparators. Indeed, the NIAUR's proposed methodology is consistent with this – and has three main steps:

» Firstly, the NIAUR benchmarks the potential controllable opex associated with the Gas to the West Pipeline by using both: (i) top-down comparators to identify ratios of opex to asset values (then applying those ratios to the asset value of the Gas to the West Pipeline); and (ii) bottom-up cost estimates from comparators.

» Secondly, the NIAUR reviews evidence on opex volatility from the historical performance of operators, such as BGE and Ofgem's analysis in the UK. The NIAUR has assumed 10% volatility as its medium case (with an upper bound of 20% and a lower bound of 5%) and assumed a normal distribution.

» Thirdly, to convert the opex variance into a variance in equity returns (assuming a normal distribution), the NIAUR calculates a beta by dividing the standard deviation in the implied return on equity (arising from the opex variance) by that of the market as a whole. The implied beta is finally converted into the WACC adjustment by applying the gearing ratio.

Using the above methodology, the NIAUR is proposing that the potential range for the WACC adjustment factor should be between 0.09% and 0.53%, with a medium point of 0.22%. On February 6th, the NIAUR published a consultation setting out both these proposed adjustment factors and the details of the methodology it has applied to derive them.[1]

In the above context, Mutual Energy commissioned Economic Insight to develop evidence and analysis as to what the appropriate WACC adjustment should be. This report sets out the results of our assessment and is structured around the three key methodological steps described above – namely:

- evidence regarding the benchmarking of controllable opex;
- evidence regarding the variability of opex; and
- the implications of opex risk for equity returns and the WACC.

For each of these three steps we set out both: (i) our views regarding the NIAUR's analysis and the appropriate interpretation of that analysis; and (ii) our additional evidence and analysis.

[1] *Gas Network Extensions in Northern Ireland: Approach to Comparing High Pressure Licence Applications. A consultation Paper.' NIAUR (2014).*

3. The amount of controllable opex

In this section we examine the evidence relating to the appropriate amount of controllable opex for the Gas to the West Pipeline. We firstly summarise the NIUAR's approach and evidence. We then provide our views on the evidence provided by the NIAUR before setting out additional evidence and analysis relevant to determining controllable opex.

3.1. The NIAUR's approach

In order to estimate the controllable opex associated with the Gas to the West Pipeline, the NIAUR uses both a 'top-down' and 'bottom-up' approach.

The top-down approach is based on calculating the ratio of controllable opex to asset values for a set of comparators, and then applies that ratio to the opening asset value of the pipeline. The NIAUR suggests that the three existing gas high pressure license holders in Northern Ireland are the most relevant comparators; and in its consultation document reports their ratios of controllable opex to opening asset values to be:

- BGE (NI): 1.51%;
- Premier Transmission: 3.05%; and
- Belfast Gas Transmission: 0.85%.

The NIAUR proposes that BGE represents the best comparator as, consistent with the Gas to the West pipeline, it is mainly located within a rural environment. On the other hand, the NIAUR notes that the Premier Transmission asset is sub-sea and so is likely to have a *"radically different"* operating cost base.[2] Finally the NIAUR also notes that the Belfast Gas Transmission has sub-sea elements and a much higher opening asset value than the other comparators. Consequently, taking the BGE ratio of 1.51% and applying it to the Gas to the West Pipeline opening asset value of £96.67m gives an implied annual controllable opex figure of £1.46m for the top-down methodology.

The bottom-up approach employed by the NIAUR consists of examining the controllable opex of BGE for the period 2012-2017. The NIAUR's rationale for this is that *"we are not aware of any reason why the structure of costs of the Gas to the West Pipeline would be materially different from those of another on land high pressure gas pipeline in NI."* The NIAUR states that the majority of BGE's costs consist of maintenance and agricultural liaison costs and that, whilst there might be some economies of scale, it is reasonable to assume that these are scalable with pipeline length. As the Gas to the West Pipeline will be 58% of the length of the current BGE network, the NIAUR assumes that the controllable opex for the new pipeline can be assumed to be 58% of those of BGE NI for these cost categories. In addition, the NIAUR assumes that:

- the Gas to the West Pipeline will also have some marginal system operation costs, which are assumed to be 25% of those for BGE; and
- there may be some non-routine project cost (such as compliance with EU directives). These are assumed to amount to £0.1m on an annualised basis.

Consistent with the top-down methodology, the NIAUR's bottom-up approach suggests total annual controllable opex of £1.505m for the Gas to the West Pipeline as a central

[2] *'Gas Network Extensions in Northern Ireland: Approach to Comparing High Pressure Licence Applications. A consultation Paper.' NIAUR (2014). Page 15.*

case. The NIAUR further suggests a lower bound of £1.2m and an upper bound of £1.8m, giving a spread of +/-20% on the base case for the controllable opex estimate.

"…as the NIAUR notes, the Gas to the West Pipeline will not include any entry/exit points with other jurisdictions… On this basis, one would expect the controllable opex of the Gas to the West Pipeline to be lower than £1.5m."

3.2. Our review of the NIAUR's approach

The top-down and bottom-up approaches employed by the NIAUR give almost the same estimates of the implied annual controllable opex of £1.460m and £1.505m. However, as the NIAUR notes, the Gas to the West Pipeline will not include any entry/exit points with other jurisdictions, meaning that "*…it will not require costs associated with cross border flows which can be significant e.g. regulatory and IT costs.*"[3] On this basis, one would expect the controllable opex of the Gas to the West Pipeline to be *lower* than £1.5m (because the £1.5m is based on BGE(NI's) costs, inclusive of entry/exit points). Therefore, we consider below what further adjustments could be made to reflect this.

We agree with the NIAUR that the features of PTL mean that it is unlikely to represent a robust comparator for the reasons set out in the consultation.

3.3. Additional analysis regarding the amount controllable opex

There are two options for making adjustments to the figures estimated by the NIAUR in order to better reflect the available evidence.

3.3.1. Top-down estimate

One option would be to take the average of the BGE (NI) and Belfast Gas Transmission figures of 1.51% and 0.85% - this would result in a figure of 1.18%, or £1.14m. This is on the basis that there are features of the BGE (NI) comparator that lead to too high a figure, and features of the Belfast Gas Transmission figure that lead to too low a figure, but that there is a little evidence to say which one is 'more right.'

3.3.2. Bottom-up estimate

The other option is to make further adjustments to the bottom-up figure. In particular, we note that the NIAUR expects any costs "*associated with system operation to be marginal and propose that they equal 25% of the BGE (NI) allowance.*" We note that the opening asset value of BGE (NI) is £205m and the opening asset value of the Gas to the West Pipeline is expected to be £64m – a ratio of 31%. Therefore, an assumption of 25% seems particularly high – it is equivalent to assuming that a 100% increase in asset value gives rise to an 80% increase in system operation costs (25%/31%) – and so is inconsistent with the view that system operation costs will be marginal.

To help arrive at a more appropriate assumption, Mutual Energy has told us that when it took on BGTL in addition to PTL, its system operation costs increased by 10%. The asset values of BGTL and PTL are roughly the same. Therefore, in this instance, a 100% increase in asset value was associated to a 10% increase in system operation costs, which is more consistent with the view that system operation costs will be marginal. Since the increase in asset value in relation to the Gas to the West Pipeline is 31%, a bottom-up approach would imply that systems operations costs for the pipeline would be 3.1% (i.e. 10% x

[3] *'Gas Network Extensions in Northern Ireland: Approach to Comparing High Pressure Licence Applications. A consultation Paper.' NIAUR (2014). Paragraph 4.17.*

31%) of BGE (NI's) system operation costs, rather than 25%. Alternatively, one could use pipeline length as the cost driver, as the NIAUR has done in relation to the components. This would give a figure of 5.8% (i.e. 10% x 58%). Given the range implied by our adjusted numbers, we propose to apply a rounded figure of 5% to estimate system operation costs (which is conservative compared to the figure of 3.1% based on asset value).

In addition, we have been told by Mutual Energy that many of the other costs included in "Other" – training, safety campaign, admin, consultancy/legal services and shared services – would be marginal too – and so in line the above, a figure of 5% would seem to be more appropriate. This gives a revised figure of £1.27m as shown in the following table.

Table 1 Revised bottom-up opex amount

Component	BGE (NI)	%	New Pipeline
Maintenance	£1.744m	58%	£1.012m
Agricultural Liaisons	£0.167m	58%	£0.097m
System Operation	£0.433m	5%	£0.022m
Other	£0.752m	5%	£0.038m
Non Routine			£0.100m
Total			£1.268m

Source: Economic Insight analysis

We note that the above figures include insurance costs (£0.21m included in "Other") as they are currently classified as 'controllable' by the NIAUR in other relevant price controls, such as BGE(NI). However, the NIAUR could decide to reclassify these costs and this would further reduce the proportion of controllable costs.

3.4. Our conclusions regarding the amount of controllable opex

Our revised top-down estimate for the amount of controllable opex is £1.141m and our revised bottom-up estimate is £1.268m. The average is £1.20m. We consider that this, which is the same as the NIAUR's 'low' estimate, represents a better midway or central estimate of the controllable opex involved in the Gas to the West Pipeline. A more appropriate low estimate might be £1.0m and a high estimate might be £1.4m.

4. The variability of controllable opex

In the following we consider the evidence regarding the likely opex variance risk associated with the Gas to the West Pipeline. In turn we address: (i) the NIAUR's approach to assessing the variance; (ii) our views regarding the NIAUR's evidence; and (iii) further evidence on opex variance using additional comparators.

At the outset we note that the variability and distribution of opex are critical assumptions in the NIAUR's analysis. To illustrate this, the below shows the (pre-tax) risk factor adjustments using the NIAUR's low, medium and high assumptions for both: (a) the amount of controllable opex and; (b) the variability of opex. All other assumptions are as per the consultation.

Table 2 Sensitivity of pre-tax risk adjustment factors to opex variability assumption

Assumed controllable opex	Low (5%)	Medium (10%)	High (20%)
Low £1.2m	0.09%	0.18%	0.35%
Medium £1.5m	**0.11%**	0.22%	0.44%
High £1.8m	0.13%	0.27%	0.53%

Source: Economic Insight analysis

The red figures are the same as those presented in Table 7 of the consultation. The black figures show the risk factor adjustment resulting from different operating expenditure amount and variability assumptions. For example, the figure highlighted in bold shows that the 'risk factor adjustment' would be 0.11% using the 'low' variability assumption (5%), but the 'medium' amount assumption (£1.5m).

The above indicates that the risk adjustment factor is primarily driven by the assumed variability of opex. To further demonstrate this the following table shows the breakdown of the change in the WACC adjustment factor from the NIAUR's low to medium scenarios (0.09% to 0.22%). This reveals that 67% of the increase in the adjustment factor between the two scenarios is due to the assumed increase in opex variability (and only 17% due to the increase in the absolute amount of controllable opex).

Table 3 Breakdown of change in WACC adjustment from the NIAUR's low to medium scenarios

Scenario	WACC adjustment factor	Change in WACC adjustment (% points)	% of change accounted for
NIAUR low scenario	0.09%		
+ increase in opex variability		+0.09%	(66.7%)
+ increase in opex amount		+0.02%	(16.7%)
+ combined effect of increased variance and amount of opex		+0.02%	(16.7%)
NIAUR medium scenario	0.22%		

Source: Economic Insight analysis

4.1. The NIAUR's approach

In its analysis of the variability and distribution of opex, the NIAUR presents three scenarios:

- the low scenario assumes that 9 times out of 10, opex will be within +/- 5% of the opex allowed in the relevant price controls;
- the medium scenario assumes that opex will be within +/- 10%; and
- the high scenario assumes that opex will be within +/- 20%.

Furthermore, all scenarios assume that the gap between actual opex and those that would be allowed in relevant price controls are normally distributed. This is equivalent to assuming that: (a) larger gaps between actual and allowed opex are less likely to arise than smaller gaps; and (b) a positive gap between actual and allowed opex is as likely to arise a negative gap of the same size.

To arrive at the scenarios and assumptions set out above, the NIAUR has relied on four sources of evidence from the energy sector.

» ***BGE (NI).*** The NIAUR found that BGE's actual controllable operating expenditure was 4.1% lower than its allowance between 2007 and 2012.

» ***Power NI.*** The NIAUR states that it found a gap between actual and allowed controllable operating expenditure of 10% in its work on the Power NI retail price control, although it notes that "*…Power NI actual costs showed much higher variance than we have evidence for in gas pipeline costs with a lot of this been driven by bad debt issues which would not pertain to the Gas to the West licence.*"

» ***Ofgem modelling assumptions.*** The NIAUR notes that in its recent work on gas and electricity transmission price controls, Ofgem assumed a gap of +/-10% in its financeability modelling work.

» ***Reopener parameters.*** Finally, the NIAUR notes that the price control would be reopened if actual opex deviates from allowances by more than 15% (which the NIAUR

states is equivalent to a variance between actual and allowed controllable opex of +/-20%).

4.2. Our review of the NIAUR's approach

Overall we agree with the approach adopted by the NIAUR, in the sense that the most robust way of considering the scope for opex variance regarding the Gas to the West Pipeline is to examine evidence on actual opex variance for suitably comparable projects or industries. However, regarding the detail of the NIAUR's methodology, we would make the following observations:

- First, that the assumption of +/-10% variance in the central case is based upon Ofgem's approach under RIIO-T1. However, on examination of Ofgem's evidence, the 10% figure is itself an assumption, rather than purely reflecting actual market data.
- Second, Ofgem's own analysis suggests that cost variance is likely to be *lower* for gas transmission than for electricity, indicating that the appropriate interpretation of the data would be a central estimate of less than +/-10% in any case.
- Third, the NIAUR's own qualitative assessment of this issue indicates that it expects only a low level of opex variability risk for the Gas to the West Pipeline.
- Finally, the evidence based on actual market data (i.e. the variance for BGE) is consistent with a much lower level of variance than +/-10%.

In the following we briefly expand upon each of the above issues in turn.

4.2.1. Ofgem's 10% variance figure is an assumption

Our understanding is that the NIAUR's choice of midway estimate of +/-10% is significantly influenced by Ofgem's modelling assumptions: *"Overall, we take the view that the Ofgem approach represents an appropriate estimate for variation that can be applied in the case of the Gas to the West Pipeline."*[4]

In order to evaluate the basis for Ofgem's assumption of +/-10%, we have reviewed the Imrecon/ECA report referenced in the consultation paper and relevant documents published by Ofgem as part of RIIO-T1. The Imrecon/ECA report does not set out the data that Ofgem relied upon, but suggests that a "broad judgement" was used: "*Ofgem has explained to us how it has reached a broad judgement that +/-10 per cent for totex variability fairly represents plausible upsides and downsides. It is noticeably a round sum amount. In our view, reflecting our comment on high level assumptions above, using a round sum amount does not invalidate the judgement but it does highlight the fact it is a judgement."*[5]

Similarly, the appendices to Ofgem's Final Proposals in RIIO-T1 do not contain actual market data to support the assumption, but note that "*These assumptions were based on a mixture of historical performance and projected plausible values.*"[6] Clearly, where possible and comparable, it would clearly be best to base decisions on actual market data – and we

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[4] *'Gas Network Extensions in Northern Ireland: Approach to Comparing High Pressure Licence Applications', NIAUR (2014), paragraph 4.30.*

[5] *'RIIO reviews – Financeability study', Imrecon/ECA (2012), page 6.*

[6] *'RIIO-T1 Final Proposals for National Grid Electricity Transmission and National Grid Gas', Ofgem (2012), Finance Supporting Document, Appendix 4, paragraph 1.3.*

provide further evidence of this below and in our analysis of additional comparators (see later).

4.2.2. A review of the evidence relied upon by Ofgem indicates a lower volatility for gas than for electricity, indicating the appropriate interpretation is a mid-point for variance of less than +/-10%

"We think that it is important the NIAUR reflects the evidence that expenditure variability risk for gas transmission is lower than for electricity transmission."

Ofgem's 'Finance Supporting Document' contains further scenario-based analyses (also incorporating a number of assumptions), which can be used to help inform the judgement as to the likely scope for opex variability. In particular, the document shows the variability of totex implied by Ofgem's analyses for electricity and gas transmission separately. Notably, Ofgem concludes that "*NGGT faces less risk in terms of totex variability than the electricity transmission companies, and similar risk to the GDNs [Gas Distribution Networks].*"[7] Figure 3.2 shows that the estimated totex variability for NGGT is around +3% to -5%. Although we are not suggesting (based on this evidence alone) that +3% to -5% represents the right range in this case (as it reflects a number of assumptions and features of the GB regulatory regime) we think that it is important the NIAUR reflects the evidence that expenditure variability risk for gas transmission is lower than for electricity transmission.

4.2.3. The NIAUR expects a low level of opex variance

In its consultation document, the NIAUR states that *"the bulk of the costs made up by maintenance and agricultural liaisons officers are predictable and based on regular tenders."* The NIAUR further states that *"system operation and regulatory management costs would be expected to be relatively flat and predictable."*[8] This suggests that, at least qualitatively, the NIAUR expects the variability of controllable operating expenditure to be low.

4.2.4. Actual market data is consistent with a central estimate for opex variance of lower than +/- 10%

In our view it is important to ensure that any benchmarking of opex variance is primarily based on actual (and verifiable) market data on variance that has occurred elsewhere. Given this, we think that the evidence presented by the NIAUR regarding the opex variance of BGE (NI), which shows variability of just 4.1%, is highly relevant. As a general principle, we suggest that market data should carry more weight than analysis that is primarily assumption based, such as the +/-10% figure referenced by Ofgem.

4.2.5. Summary of our review of the NIAUR's approach

In summary, we agree with the overarching approach adopted by the NIAUR regarding the determination of the likely scope for opex variance regarding the Gas to the West Pipeline. In particular, we consider it sensible to examine data on opex variance for comparators. However, we consider that that: (i) more weight should be attached to comparators that reflect actual market data, rather than assumptions. Consequently, the opex variance for BGE (NI) is the most relevant data point; and (ii) the appropriate interpretation of the Ofgem analysis cited by the NIAUR is that the central point for opex variance regarding gas transmission should, in any case, be less than +/-10%. In summary, therefore, we consider that the evidence presented by the NIAUR in the consultation document is itself

[7] *'RIIO-T1 Final Proposals for National Grid Electricity Transmission and National Grid Gas', Ofgem (2012), Finance Supporting Document, paragraph 3.37.*

[8] *'Gas Network Extensions in Northern Ireland: Approach to Comparing High Pressure Licence Applications. A consultation Paper.' NIAUR (2014). Page 16.*

consistent with an opex variance assumption of lower than +/-10% and, most likely, that the appropriate figure could be as low as +/- 4% (although in the following section we provide evidence from additional market comparators to examine this further).

4.3. Additional analysis regarding the variability of opex

In addition to reviewing the NIAUR's analysis of opex variance, we have developed further evidence of the scope for variability (and the implications for equity returns) based on a wider set of comparators. In particular, we have looked at variations in actual versus allowed opex for:

- energy comparators;
- water industry comparators; and
- airport and rail comparators.

Based on our comparator analysis (which is set out in more detail in the remainder of this section) we suggest that the appropriate range for opex variance is between 3% and 7%, with a 'midway' estimate of 6%. Our view is that, of the comparators we have examined, energy and water comparators are the most appropriate for the purpose of benchmarking opex variability, as the risk profiles of airports and rail network operators are less closely aligned to those of gas transmission.

4.3.1. Additional energy related comparators

This section sets out our analysis of energy sector comparators. Specifically, we analyse:

» ***Gas transmission in GB.*** In particular, we evaluate what the actual market evidence says about the difference between actual and allowed controllable operating expenditure of National Grid Gas Transmission (NGGT).

» ***Gas transmission in NI.*** Specifically, we compare the actual controllable opex of BGTL and PTL to the shadow price control between 2008/09 and 2012/13.

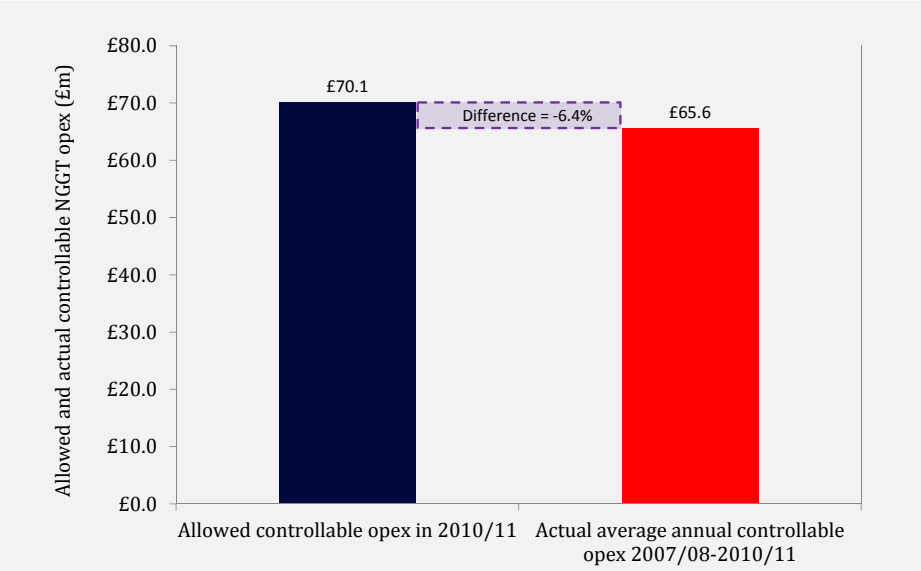
4.3.1.1. Gas transmission in GB

Since Ofgem's modelling work suggests that cost variability may be lower for gas transmission than for electricity transmission; and the +/-10% figure relates to both (and is itself, at least in part, a judgement), it is important to take into account of the actual market data relating to gas transmission in GB.

Helpfully, Ofgem published data NGGT's actual controllable operating expenditure compared to its allowed controllable operating expenditure for the last price control – covering the years 2007/08 to 2010/11.[9] As illustrated by the table below, the data shows that NGGT's actual expenditure was £65.6m on average over the four years, whereas its allowance in 2010/11 was £70.1m – a difference of -6.4%.

[9] *'Transmission Annual Report for 2010/11', Ofgem (2012), Figure 8.*

Figure 1 NGGT actual versus allowed controllable opex 2007/08-2010/11



Source: Economic Insight analysis of Ofgem data

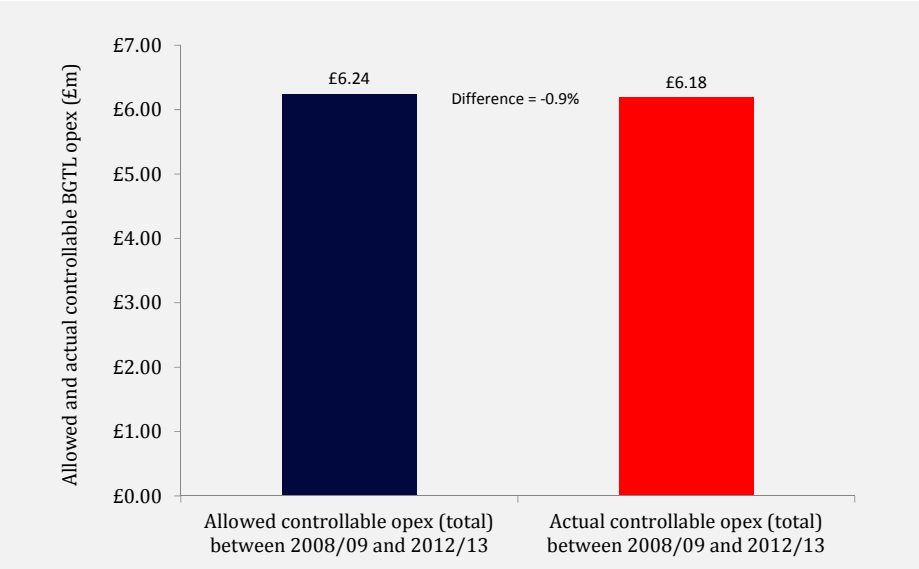
This figure is significantly lower than the 10% figure used in the NIAUR's midway scenario and, indeed, is closer to both the figure used in the NIAUR's low scenario and the figure implied by the BGE (NI) data.

4.3.1.2. Gas transmission in NI

Our client, Mutual Energy, has provided us with data on the actual and 'allowed' controllable operating expenditure (under the shadow price control) of Premier Transmission and Belfast Gas Transmission between 2008/09 and 2012/13. The figure below shows that:

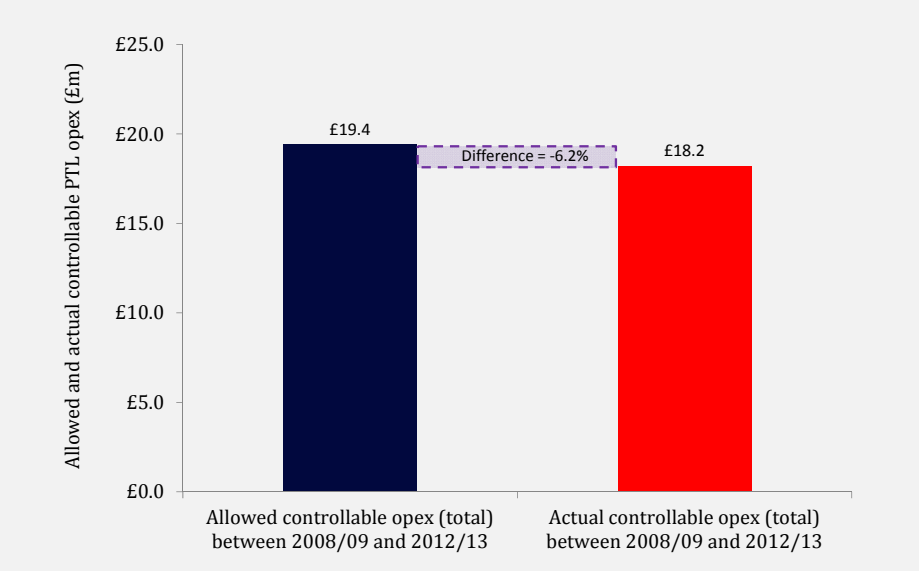
- Belfast Gas Transmission's actual expenditure over the five years was £6.18m and its allowed expenditure was £6.24m – a gap of -0.9%; and
- Premier Transmission's actual expenditure over the five years was £18.2m and its allowed expenditure was £19.4m – a gap of -6.2%

Figure 2 BGTL actual versus allowed controllable opex 2008/09-2012/13



Source: Economic Insight analysis of Mutual Energy data

Figure 3 PTL actual versus allowed controllable opex 2008/09-2012/13



Source: Economic Insight analysis of Mutual Energy data

Again, both figures are significantly lower than the 10% figure used in the NIAUR's midway scenario. As noted previously in this report, there are reasons to think that the Belfast Gas Transmission is a closer comparator to the Gas to the West Pipeline than Premier Transmission, indicating that it might be more appropriate to rely on the lower figure.

4.3.2. Conclusion on energy industry comparators

The table below summarises the recent actual market evidence of controllable operating expenditure variability from the energy sector comparators.

Table 5 Summary of energy sector comparators

Source	Actual / Allowed %
BGE (NI)	-4.1% (5 years, 2007/08-2011/12)
NGGT	-6.4% (4 years, 2007/08-2010/11)
Belfast Gas Transmission	-0.9% (5 years, 2008/09-2012/13)
Premier Transmission	-6.2% (5 years, 2008/09-2012/13)

Source: Economic Insight analysis

The table shows that:

- none of the 'projects' exhibit variability of the NIAUR's proposed midway estimate of +/- 10%;
- all of the project are below +/- 7%; and
- two of the projects are below the current low estimate of +/- 5%.

Therefore, this evidence suggests that the current midway estimate of +/- 10% is too high. The actual market evidence suggests that variability in excess of +/- 7% is unlikely, and so may be a more appropriate 'upper-bound' estimate. Moreover, as noted above, Ofgem's scenario-based analyses suggest that the controllable operating cost variability for gas transmission is lower than for electricity transmission, and so a figure lower than the average 10% would also be appropriate on this basis.

4.3.3. Water industry comparators

In our view the water industry is a helpful comparator to consider with regard to the potential scope of opex risk within the WACC in relation to the Gas to the West Pipeline. In particular, we note that the Imrecon / ECA report for Ofgem (which, as noted above, is a key source for the NIAUR's own assessment of opex variability) specifically makes reference to the water sector, stating that it: *"is generally thought to have a similar risk profile to energy networks."*[10] We further note that: (i) Ofwat placed weight on energy retailer margins when determining appropriate allowed net retail margins in the water sector for PR14; and (ii) when determining an appropriate range for the return on regulatory equity (RORE), which is highly pertinent to the issues under consideration here, Ofwat explicitly examined RORE ranges for gas distribution, noting that: *"we would expect to see a consistency in the overall range for RORE for regulated utilities with comparable returns."*[11]

Indeed, we note that (similar to gas transmission) the water industry is characterised by:

- a high level of capital intensity (i.e. a low relative amount of opex);
- stable and relatively predictable demand; and
- a predictable and stable regulatory regime.

For this reason we have compared allowed opex (as set during price controls) with actual company opex over time for the water industry. Our start point was to examine the difference between actual and allowed opex for Northern Ireland Water (NIW), as the fact that its operating area is Northern Ireland is likely to further improve comparability.

[10] *'RIIO Reviews: Financeability study.' Imrecon and ECA report submitted to Ofgem (November 2012). Page 4.*

[11] *'Setting price controls for 2015-20 – risk and reward guidance.' Ofwat (2013). Page 47.*

4.3.3.1. Northern Ireland Water

The NIAUR publishes information on NIW's actual and allowed opex in its Cost and Performance reports. In particular, for the period 2010-13, the NIAUR set out its assessment of the extent to which NIW has genuinely outperformed its opex targets for reasons of efficiency (rather than say, by deferring projects). In our view this is a highly relevant measure, as we are seeking to identify the extent to which *controllable* opex could vary from that originally assumed by the regulator (as ultimately, this is the risk to which equity is genuinely exposed). Using the data published by the NIAUR we therefore calculated the variation in opex arising from outperformance as a percentage of allowed opex in each year, as shown in the following table.

Table 6 Northern Ireland Water allowed and actual opex

Calculation step	2010-11	2011-12	2012-13	Total
Allowed opex - PC10 FD Target (£m)	£220.4	£215.1	£207.2	£642.7
NIW total opex underspend (£m)	-£17.1	-£25.0	-£15.5	-£57.6
NIAUR's assessment of underspend due to outperformance (£m)	-£6.1	-£6.9	-£6.5	-£19.5
Allowed opex adjusted for outperformance (£m)	£209.4	£197.0	£198.2	£604.6
NIW actual opex spend (£m)	£203.3	£190.1	£191.7	£585.1
Opex variance from outperformance (%)	-2.9%	-3.5%	-3.3%	-3.2%

Source: NIAUR[12]

Our analysis shows that the total opex variance for NIW (arising from outperformance) was -3.2% over the three years to 2012/13. Over this period, opex variance from outperformance was no more than -3.5% in any individual year.

4.3.3.2. England and Wales Water and Sewerage Companies

In addition to the above, we examined the opex variance of water and sewerage companies (WASCs) in England and Wales, which are subject to a revenue based price control model, as per NIW. Specifically, we:

» Examined the average annual allowed opex set by Ofwat (the regulator) at the last price review (PR09).[13]

» Obtained data on WASC actual opex in each of the three years since the control period started (2010/11, 2011/12 and 2012/13) – as reported in their regulatory accounts.[14]

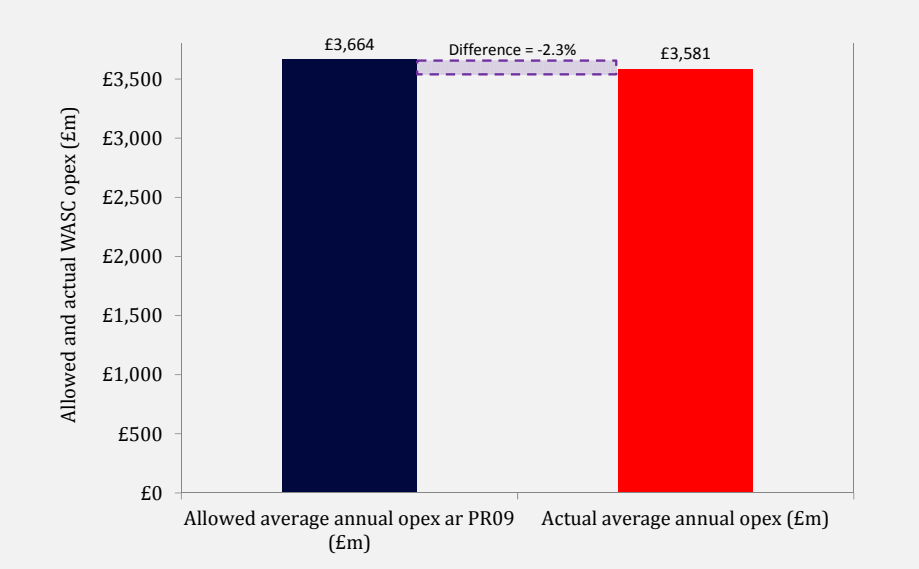
[12] *'Cost and Performance Report For NI Water - PC10.' NIAUR (2013). Tables 2.2 and 2.3*

[13] *As reported in: 'Ofwat PR09 Final Determination.' See Table 37: Operating expenditure by company (annual average post-efficiency). Ofwat has advised us that the data is in 2007/08 prices and so the reported allowed opex of £3,323m as published has been inflated by RPI in each subsequent year and then averaged (giving £3,664m).*

[14] *Actual WASC opex figures are taken from 'operating cost analysis' tables as reported in the notes to company's regulatory accounts. These provide a breakdown of opex by area. Ofwat advised us that both third party services costs and retail costs*

» Then, finally, we calculated the % difference between actual and allowed opex for the industry as a whole across the three years to date, as shown in the chart below.

Figure 4 WASC actual versus allowed opex over PR09



Source: Economic Insight analysis of Ofwat data and WASC regulatory accounts[15]

Our analysis shows that across the industry, actual opex has varied by -2.3% relative to allowed opex over the price control period to date. Regarding the methodology we have employed to calculate this variance, there are three important points to highlight:

» First, we think that it is appropriate to look at the variance over the three years combined, as equity holders would generally tend to think about the risk to returns from the perspective of a price control period (i.e. the fact that opex or equity returns could vary be more or less than this in any given year is not particularly informative of the actual risk to which equity holders are exposed).

» Second, we think that it is appropriate to look at the variance for the industry as a whole over time (rather than individual companies), as capital is readily substitutable across individual companies within the industry and, as such, the risk profile across companies is unlikely to vary in any meaningful way. We note that this was Ofwat's rationale (consistent with advice from PwC) for retaining a single notional industry WACC for the forthcoming PR14 price control.[16] Notwithstanding this point, our analysis also shows that 8 of the 10 WASCs included in our analysis had a variance of less than +/- 3% and only one had a variance of greater than +/-10%.

» Third, because the available data does not allow us to specifically isolate variance in *controllable* opex in relation to WASCs in England and Wales, the opex variance factor

are included in the allowed opex figures above, and so we have also included these in our actuals (noting that Ofwat's total allowed opex at the start of PR09 would have included retail costs, even though the requirement to report them separately only came into effect during the price control period). WASCs included in the analysis were: Anglian Water, Dwy Cymru, Northumbrian Water, Severn Trent, South West Water, Southern Water, Thames Water, United Utilities, Wessex Water and Yorkshire Water.

[15] *Analysis is in nominal outturn prices.*

[16] *See: 'Cost of capital for PR14: Methodological considerations.' PwC report for Ofwat (July 2013).*

we have calculated *may* over-state the true opex volatility risk to which equity holders are exposed (this is the case so long as one supposes that it is the uncontrollable element of opex that is most subject to volatility risk, which we consider to be likely in most instances).

In summary, our analysis of opex variability in the water sector suggests a range of between +/-2.3% to +/-3.2%.

4.3.4. Airport and rail comparators

This section briefly sets out additional evidence from other regulated sectors, namely Heathrow and Gatwick airports (which are subject to price controls by the Civil Aviation Authority) and Network Rail (which is subject to price controls by the Office of Rail Regulation). As noted above, we consider these sectors to be less comparable than the gas and water sectors, and so attach less weight to them in our conclusions.

4.3.4.1. Airports

The table below shows the actual and allowed operating expenditure of Heathrow and Gatwick airports between 2008/09 and 2012/13.

Table 7 Comparison of Heathrow and Gatwick airports' allowed and actual opex

£m 2011/12 prices	08/09	09/10	10/11	11/12	12/13	Total
Heathrow allowed	968	952	956	962	969	4,807
Heathrow actual	1,071	1,052	996	1,001	997	5,117
Difference %						*6.4%*
Gatwick allowed	315	313	314	315	312	1,569
Gatwick actual	312	319	281	281	285	1,478
Difference						*-5.8%*

Source: Economic Insight analysis of CAA data,

The table shows that:

- for Heathrow, actual operating expenditure was higher than allowed operating expenditure by 6.4%; and
- for Gatwick, actual operating expenditure was lower than allowed operating expenditure by -5.8%.

Again, both figures are significantly lower than the 10% figure used in the NIAUR's midway scenario.

4.3.4.2. Rail

Network Rail's regulatory accounts show that its actual controllable operating expenditure between 2009/10 and between 2011/12 was £2,887m and its allowed controllable operating expenditure was £2,581 – a difference of 11.5%.[17]

We note that part of the reason for this relatively high difference, which is closer to the NIAUR's midway estimate, may be caused by the short time period over which the

[17] *'Network Rail Infrastructure Limited Regulatory Financial Statements', (2012), Statement 7a.*

difference is calculated. We have therefore checked the difference for entirety of the previous price control, running from 2004/05 to 2008/09.[18] The data shows that:

- the gap between actual and allowed operating expenditure (controllable and uncontrollable) was much lower at +1.2%; and
- according to Network Rail "*The ACR 2003 splits operating expenditure into controllable and non-controllable costs and it is the latter that has exceeded the determination across the control period.*"[19]

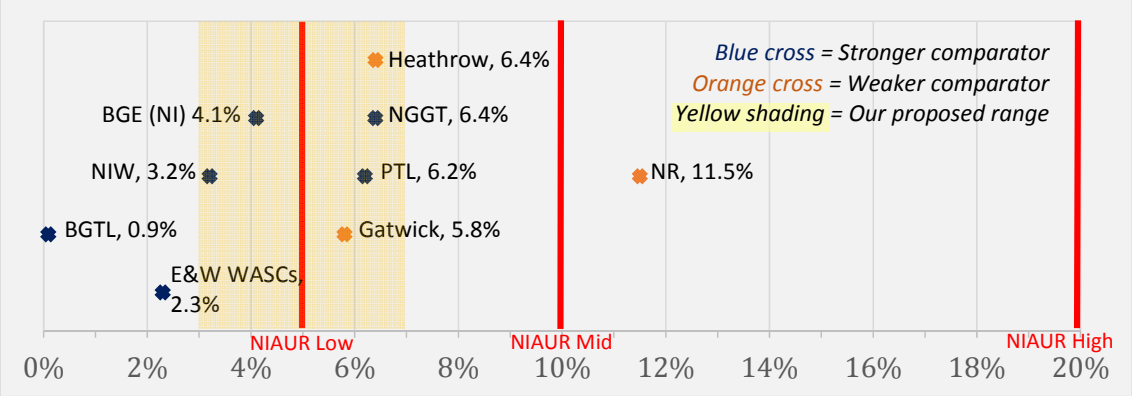
4.3.4.3. Conclusion on airport and rail comparators

Although we consider the above airport and rail regulated sectors to be less comparable than energy and water, this evidence is also consistent with the view that a figure of +/-10% is too high for a midway estimate.

4.4. Our conclusions regarding the variability of controllable opex

Based on the above analysis, the figure below summarises the actual market data on controllable operating cost variability. The range is between 0.9% and 11.5%.

Figure 5 Summary of comparator evidence on opex variance relative to NIAUR range



Source: Economic Insight analysis

On the basis of this data we consider that:

» ***An appropriate low estimate of variability would be around +/-3%***. This is based on the fact that the average opex variability of BGE (NI), NIW, BGTL and E&W WASCs together is just under this level.

» ***A suitable midway or central estimate of variability would be around +/-6%***. This is based on the fact that most comparators have operating cost variability at or below this level (and it is also midway between the minimum and maximum estimates of 0.9% and 11.5%).

» ***The maximum estimate should be +/-7%***. This is based on the fact that all but Network Rail are below this level – and that Network Rail figure may: (a) not be as good a comparator as the others; and (b) may exhibit a lower level of variability over a longer time period.

[18] *'Network Rail Infrastructure Limited Regulatory Financial Statements', (2009)*

[19] *'Network Rail Infrastructure Limited Regulatory Financial Statements', (2009), page 4.*

Finally, we note that the NIAUR's 'high' estimate is inconsistent with the evidence and should be disregarded. That is, the high estimate suggests that that it is more likely than not (specifically a 56.5% chance) that opex variability would be greater than 7%.

5. Conclusions

The evidence and analysis set out above suggests the more appropriate alternative assumptions for the level and variability of controllable opex are:

- £1.0m and 3% in the low scenario;
- £1.2m and 6% in the medium scenario; and
- £1.4m and 7% in the high scenario.

The table below shows the revised pre-tax WACC adjustment factors using these alternative assumptions and the same calculation methodology as the NIAUR. It shows that the pre-tax WACC adjustment factors range between 0.04% and 0.14%.

Table 8 Revised pre-tax risk adjustment factors with alternative assumptions

Assumptions	Low (3%)	Medium (6%)	High (7%)
Low (£1.0m)	**0.04%**	0.09%	0.10%
Medium (£1.2m)	0.05%	**0.11%**	0.12%
High (£1.4m)	0.06%	0.12%	**0.14%**

Source: Economic Insight analysis

Our view is that the appropriate midway or central estimate to use is 0.11%, which is half of the current midway or central estimate of 0.22%. Alternatively, the data is more supportive of the NIAUR's 'low' estimate of 0.09% than it is of its central estimate of 0.22%, and without further analysis, we recommend that this is used. Finally, the table shown overleaf provides full details of the calculation steps used to derive the above adjustment factors.

Table 9 Calculation steps for WACC adjustment factor

Calculation step	Low case	Medium case	High case
Controllable opex (£m)	£1.000	£1.200	£1.400
Variation (%)	3.00%	6.00%	7.00%
Variation value (£m)	£0.030	£0.072	£0.098
Expected equity return (£m)	£0.818	£1.818	£2.818
Min (£m)	£0.788	£1.746	£2.720
Max (£m)	£0.848	£1.890	£2.916
Min RORE (%)	6.55%	14.51%	22.61%
Max RORE (%)	7.05%	15.71%	24.24%
Spread (%)	0.50%	1.20%	1.63%
Standard deviations	1.65	1.65	1.65
SD Equity	0.15%	0.36%	0.49%
SD Market	8.50%	8.50%	8.50%
Equity beta	0.02	0.04	0.06
ERP (%)	5.30%	5.30%	5.30%
ECA (%)	0.09%	0.23%	0.31%
Gearing (%)	62.50%	62.50%	62.50%
WACC Adj	0.04%	0.08%	0.12%
WACC Adj - pre-tax	**0.04%**	**0.11%**	**0.14%**

Source: Economic Insight analysis

Further information

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