

Appendix 09.22 Real Price Effects



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Summary of changes since October Draft plan

1. Updated proportion of labour following review of GDSP expenditure
2. Updated RPE £m resulting from applying labour and oil RPE forecasts to Cadent's December plan
3. Discuss potential indexation of Plant Hire and Backfill
4. Expand analysis of PE pipe & fittings
5. Propose indexation of Plant Hire

1. Introduction

This appendix sets out:

- the indices we propose to use for the purposes of RPE indexation;
- the Real Price Effects (RPEs) we have assumed when compiling the Plan; and
- how we consider RPE indexation should be applied in practice.

2. Indices for the purposes of indexation

We expect Real Price Effects (RPEs) to be a higher profile issue at RIIO-2 than at RIIO-1 for two reasons. First, because, in order to remove a source of potential windfall gains or losses, Ofgem has decided to put in place a system of cost indexation so that certain cost allowances will flex in period following changes in appropriate indices, which will feed through to allowed revenue in period. Second, because all revenues in RIIO-2 will be indexed by the CPIH measure of inflation rather than RPI, and since CPIH is typically around 1% lower than RPI, we would normally expect the gap between nominal and real prices around 1% greater than previously under RPI indexation. We have supported Ofgem’s proposal to index RPEs, subject to ensuring any index is representative of network costs, workable in practice and covers material cost items. To this end we presented our initial views in September 2018 at the second meeting of the Cost Assessment Working Group.

We propose the application of indices where the potential price variation for any costs as compared to the Plan is likely to be at least 0.5% of controllable totex, which equates to 0.2% of RoRE for Cadent. We believe that this level is reasonable in the context of Return Adjustment Mechanisms and would cover the vast majority of our cost base, but not cover so many cost types as to be overly complex to implement.

The costs which we considered for indexation, as a proportion of controllable totex, are shown below.

Table 1: Totex breakdown

Cost	2017/18		Index	Comment
	Totex %			
Direct and Contract labour	72%		Yes	See below
Plant hire	6%		Yes	See below
Backfill materials	3%		No	See below
PE Pipe & fittings	2%		Yes	See below
Xoserve	2%		No	In RIIO-2 to be non-controllable, subject to pass-through
Vehicles	2%		No	Price unlikely to vary by 0.5% totex, but potential Brexit impact
Rent & Rates	2%		No	Price unlikely to vary by 0.5% totex
Blacktop	1%		No	Price unlikely to vary by 0.5% totex
Steel / copper / brass fittings, valves, pipes	1%		No	See below
Others	10%		No	Immaterial individually
	<u>100%</u>			

In October we stated that we believed that labour costs, and the oil price impact on PE pipe & fittings were strong candidates for indexation, and that we were reviewing whether Blacktop used in reinstatement should be included within indexation. Since October, we have completed our review of the composition of repex costs from our contractors, the result of which has been a reduction in our estimated proportion of our labour costs, increases in the proportion of plant hire and backfill materials, and a reduction in the estimated proportion of

Blacktop. The potential indexation of labour, plant hire, backfill materials and PE pipe and fittings are considered separately below.

In respect of some of the remaining items shown in the table above:

- For vehicles, the amount of spend is relatively low and major price changes would be required to reach our materiality threshold. Our plan includes cost increases associated with necessary improved environmental emissions (see Appendix 07.04.00 Environmental Action Plan), and historical fluctuations are not material enough to support indexation. However, there may be material uncertainty due to the impact of Brexit.
- For Steel / Copper / Brass fittings, valves and pipes, we do not believe that these should be indexed because the amount of spend is relatively low, although the metal prices are volatile. If all the metals changed prices at the same time, a change of around 67% would be needed to hit the 0.5% of totex variability. For any one of the three, the metal price would need to triple to reach the 0.5% of totex threshold. Neither outcome appears likely.

In respect of how to choose a suitable index, as we stated in our response to the June 2019 consultation on Cost Assessment, we consider that it should be:

1. Accurate - with activities that are comparable to those of GDNs, and with accurate data;
2. Independent - not dominated by GDNs;
3. Credible - produced by a reputable body;
4. Continuous – with no jumps in the data;
5. Excluding efficiency – or RPEs and ongoing efficiency will be mixed;
6. Transparent – being in the public domain; and
7. Finalised on a timely basis.

We believe that the first five criteria are essential, and the last two desirable, in operating RPE indexation.

Labour

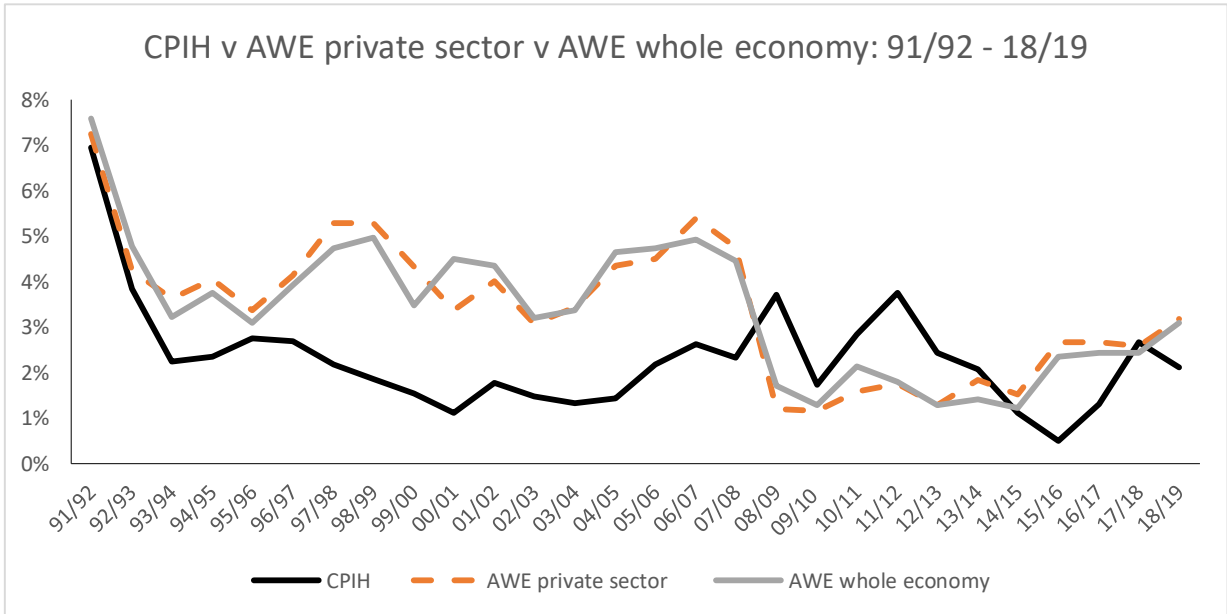
For labour, we show that this is a material cost in the Table 1 above. Because it represents nearly three quarters of our costs, a price movement of 0.7% relative to inflation as measured by CPIH would breach our 0.5% of totex materiality threshold.

In respect of the indices that could be used for indexation, as we set out in our October Plan, , ideally this would reflect the split between labour which is under the direction of Cadent, both Direct Labour and Contractors, and Contractor labour (mainly on mains replacement) which is managed by third parties, and subject to fluctuations in tender prices. However, we explained that we had been unable to find a suitable index specifically for Contractor labour managed by third parties, and Cadent could, as in previous price control periods, manage the risk of fluctuations in tender prices. Therefore, we proposed that the same index should apply to both Direct and all Contractor labour.

Our July Plan identified two alternative labour cost indices, the Annual Survey of Hours and Earnings (ASHE) data, and Average Weekly Earnings (AWE) industry indices. In October, as shown below, we also reviewed the possibility of using the AWE private sector index.

The chart below shows two measures of earnings growth, the AWE measures for the private sector and for the whole economy, published by the ONS, from 1991/92 to 2018/19, and compares them against CPIH. We have chosen the AWE private sector measure for this chart because it covers a longer time period than the other potential indices. We show the AWE whole economy measure because it highlights, at the highest level possible, the difference between earnings growth and inflation.

Figure 1: Inflation and Earnings growth



The chart shows that there have been periods of sustained deviation between earnings growth and inflation. For example, for the period of fifteen years from 1993/94 to 2007/08, private sector earnings growth was well above CPIH, on average by around 2.2%. Similarly, for the period of six years from 2008/09 to 2013/14, earnings growth fell below inflation, on average by 1.0% p.a. The results for the whole economy show a similar picture.

The ONS private sector data is published monthly, two months in arrears, with the most recent month containing provisional data, as part of the Earn02 series. It is high level, and not targeted to gas industry activities, but has the advantage that it is more accurate than any other potential measure. The ONS attributes 95% confidence to monthly growth rates being within 0.7% of the stated amount. In addition, this calculation has the advantage of using the average of twelve monthly data points to compare against the prior year, reducing the impact of any single month’s data inaccuracy.

In respect of continuity of calculation, the only change we have found is that sixth form colleges moved from public sector to private sector classification in 2012, but this would not affect the RIIO-2 time series.

The index most targeted to gas distribution is the ASHE index, which was developed by Ofgem at GD1 for a notional GDN workforce and applied in the Regional labour costs calculation. This uses ASHE data, calculated and published once a year in the Autumn by the ONS, with a weighting of the relevant three digit SOC codes. The index would need to be updated for RIIO-2, and ought to be broadly representative of efficient GDN costs, more so than the other, higher level indices that are available. However, although this index should be the closest match to efficient GDN costs, which is why we previously favoured it, there are several disadvantages associated with it.

- First, the data is provisional and can be subject to revision the following year – as for the results for 2016 – which would lead to adjustments being made to revenue three years after the relevant year, and up to four years later, if the data is published late. In those circumstances, adjustments for one price control period would still be being made most of the way through the next.
- Second, although the main SOC codes used, 212, 311 and 531, fall into the category of the most accurate ASHE codes produced, the ONS is still only confident that the values are accurate within +/- 10%.

- Third, its publication date is close to the annual iteration of the Price Control Financial Model (PCFM). Indeed, it has been published as late as December (2013) which would only just be in time to inform the annual iteration of the PCFM in January. Further slippage in the publication date would make it too late to inform the PCFM for the year n+2.
- Fourth, in respect of continuity in the method of calculation, there have been significant changes over time, in particular in 2000/01, 2005/06 and 2010/11, although two versions of the data were published on the last two occasions. Therefore, there would appear to be a significant risk of changes in the methods of calculation in RII02.

In addition, the key advantage of the approach, that of matching GDN activities closely, may be overstated. At RII0-1, data from three companies was available to calculate the weightings between SOC codes, but the figures were very different. For example, the 32% weighting applied to code 531, Construction, was the average of 47%, 48% and 0%. Given very different assumptions between companies about which SOC codes their activities fall into, the advantage of matching GDNs' activities seems weakened significantly.

Finally, although, as in July and October, we note the potential for the ASHE data to reflect movements in regional differences, due, for example to HS2 in West Midlands and London, we note that the data is typically less robust at that level, and occasionally unavailable.

The last alternative is one we identified in July and October, the AWE data by industry sector – the ONS' Earn03 series. This data is neither as detailed as the ASHE data, nor as high level as that of the AWE private sector. The Earn03 series is published monthly, two months in arrears, with the most recent month containing provisional data, typically revised in the following month.

To apply the AWE by sector data, we mapped most, 94% by value, of the three digit SOC codes from the ASHE occupational data onto seven of the twenty four AWE industry sectors, with the remaining 6% spread pro-rata, as shown below.

Table 1: AWE category weights

AWE industry	SOC codes	SOC weights %	Spread "Other" %	AWE industry weights %
Construction	312, 531, 814, 912	40.0%	2.4%	42.4%
Professional, technical, scientific	212, 311	35.7%	2.1%	37.8%
Admin & Support	412, 413, 415, 421	7.6%	0.5%	8.1%
Manufacturing metals / metal products	112, 522	5.8%	0.3%	6.1%
Financial & Insurance	115, 242, 353	2.5%	0.1%	2.6%
Public administration	356	1.6%	0.1%	1.7%
Information & Communication	213, 313, 343	1.2%	0.1%	1.3%
Other	12 remaining codes	5.8%	-5.8%	
		100.0%	0.0%	100.0%

Consequently, in using AWE industry data, we applied a 42.4% weighting to the AWE Construction industry sector, 37.8% weighting to the Professional, technical and scientific sector etc.

In respect of the accuracy of the AWE industry sectoral data, the ONS describes itself as 95% confident that the monthly growth rates associated with Construction are within 2.6%, Professional, technical, scientific within 2.9%, and admin & support within 3.2%. This approach also has the advantage of averaging twelve months'

data, so an inaccurate reading for one month has less of an impact than if a snapshot at a single point in time were used – unlike the ASHE data.

In respect of continuity of calculation, the only change we are aware of concerns the classification of sixth form colleges in the education sector between 2010 and 2012, which would appear not relevant to the sectoral data we have used.

In the table below, we rank each of the three alternatives against the criteria for a good index described above.

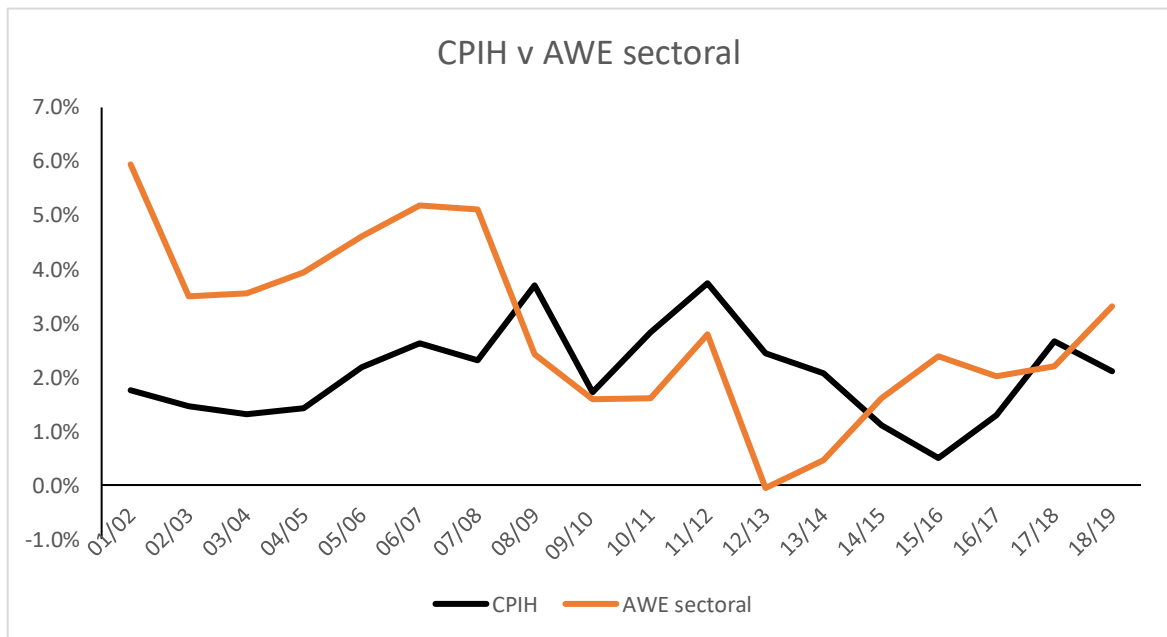
Table 2: Options for Labour Index

Labour indices	Accurate		Independent	Credible	Continuous	Excludes efficiency	Transparent	Timely
	GDN proxy	Data accuracy						
AWE private sector								
AWE industry sector								
ASHE notional GDN								

We believe that the AWE industry sector data is the most suitable for the indexation of labour costs. It is a reasonable proxy for GDN activities, being dominated by two of the twenty-four industries making up the AWE view of the private sector, is more accurate and continuous in its method of calculation, and more timely than the ASHE notional GDN data, although the latter, in theory at least, should be a better proxy for GDN activities.

The chart below shows the path of the AWE industry sector data against CPIH for the years from 2001/02 to 2018/19.

Figure 2: Inflation and AWE sectoral growth



The chart shows that the AWE sectoral index follows a similar shape to the CPIH line, but with variations. The AWE sectoral line was consistently above CPIH over the years from 2001/02 to 2007/08, falling below it from 2009/10 to 2013/14.

Plant hire

We mentioned Transport and Plant as a potential candidate for indexation in October. Since then, our decomposition of repex costs from our contractors and sub-contractors and identification of the Plant hire element within opex Transport and Plant has enabled us to estimate that Plant Hire makes up around 6% of our

controllable totex in 2017/18 (5.2% within repex and 0.8% within opex). Consequently, it would require a sustained price variance of around 8% relative to CPIH to hit the 0.5% of totex threshold.

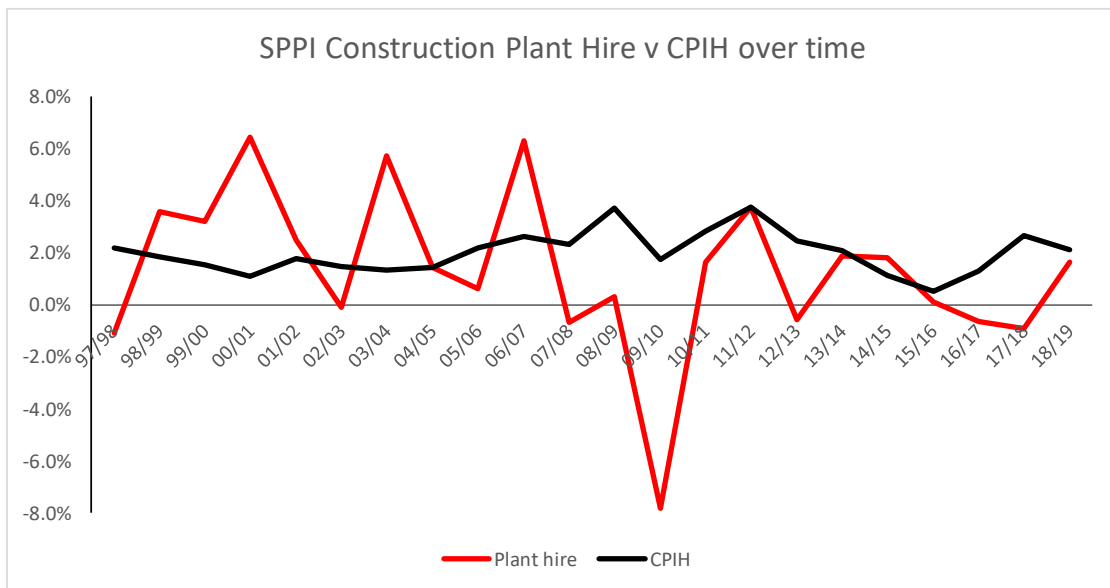
We have identified a single suitable index, the ONS' Construction Plant Hire index within the Services Producer Price Index, which appears to represent a reasonable proxy for our Plant Hire costs, especially for repex. It contains eight categories of prices for:

- Cranes (1.5%);
- Powered Work Platforms (8.5%);
- Hauliers and Other vehicles (2.7%);
- Small and Non-operator Plant (42.2%);
- Earth moving equipment (9.8%);
- Rollers / Compaction plant (8.7%);
- Site-Handling equipment (11.0%); and
- Site accommodation (15.6%).

The index is published quarterly, around eight weeks in arrears, and is largely collected by a survey, covering over 160 companies providing Construction Plant Hire services.

Data for the index is available from 1996/97 onwards, and the annual change relative to CPIH is shown in the chart below.

Figure 3: Inflation and construction plant hire



The chart shows that there have been sustained variances in the index as compared to CPIH. Early in the period, from 1998/99 to 2002/03, the average level of index cost was around 6% above that of CPIH, which represents approaching 0.4% of controllable totex. However, over the period from 2007/08 to 2011/12, the average level of index cost was nearly 13% less than that of CPIH – which represents around 0.8% of controllable totex, well above the 0.5% threshold.

In respect of the quality of the SPPI Construction Plant Hire index, the SPPI User Guidance 2015 describes the checks performed on the data received, querying any quarterly movements greater than 7.5%, and initially excluding any variance greater than 25%, subject to explicit confirmation. The ONS also targets 84% completion for the initial publication in the first quarter, and 95% in the second quarter, as described in the 2015

Quality and Methodology information sheet. We also note that the standard errors published by the ONS for this index appear relatively low, far lower than for some of the other elements making up the SPPI.

In the light of the above, we consider that this index broadly satisfies our seven criteria for a suitable index, described above. We believe it should be broadly representative of GDN costs and mathematically accurate, largely independent of GDNs, produced by a credible body – the ONS, continuous and excluding efficiency. Our only minor concern relates to the timeliness of publication. Although the index is published quarterly, with the most recent two quarters being shown as provisional and subject to amendment, the SPPI may be revised within five quarters.

No forecasts are available for the Construction Plant Hire index, so in our Plan we have assumed that prices move in line with CPIH.

Backfill materials

We have newly identified backfill materials as a possible candidate for indexation following the completion of our work in decomposing repex costs from our contractors and sub-contractors. We estimate that backfill materials represent around 2.7% of our controllable totex in 2017/18. Consequently, it would require a sustained price variance of around 20% relative to CPIH to hit the 0.5% of totex threshold.

There are different types of backfill – the Department of Transport’s Highway Authority and Utilities Committee (HAUC) identified five classes, and materials can contain either recycled or virgin aggregate, the latter being significantly more expensive, and varying in price according to the amount of notice provided to the quarry and the quantity needed.

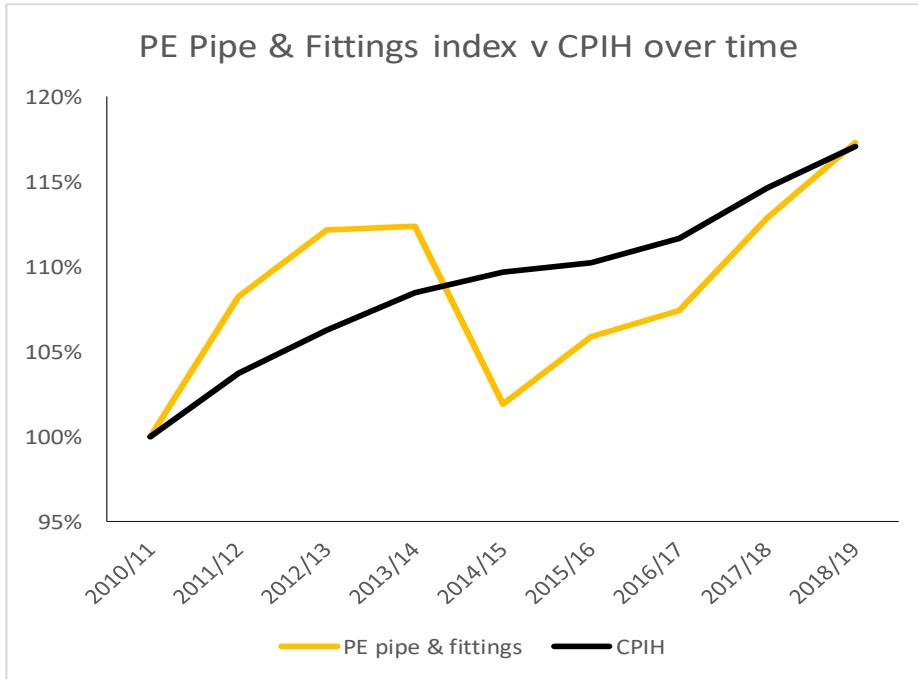
On balance we do not consider backfill materials a good candidate for indexation, as they do not represent a uniform product, and would require a significant change in the price level to breach the 0.5% of totex threshold.

PE Pipe & Fittings

PE pipe and fittings represented around 2% of controllable totex in 2017/18, and are significantly influenced by the price of oil. Our main contracts for PE pipe and fittings are indexed, because according to suppliers, around 65% of the cost is associated with the raw material PE cost, which itself is associated with the price of oil and gas. Consequently, it would require a movement in the raw material cost of approaching 40%, causing an overall price variance of 25%, in order to breach the 0.5% of totex threshold.

The index referred to in the contracts is the London Oil Reports ICIS PE100 mid-price £ benchmark, a series which begins early in 2010. Using a 65% weighting to the PE100 raw material cost, keeping the remaining 35% constant in real terms, we have constructed an index for the whole cost of PE pipe and fittings, and compared this to CPIH as shown below.

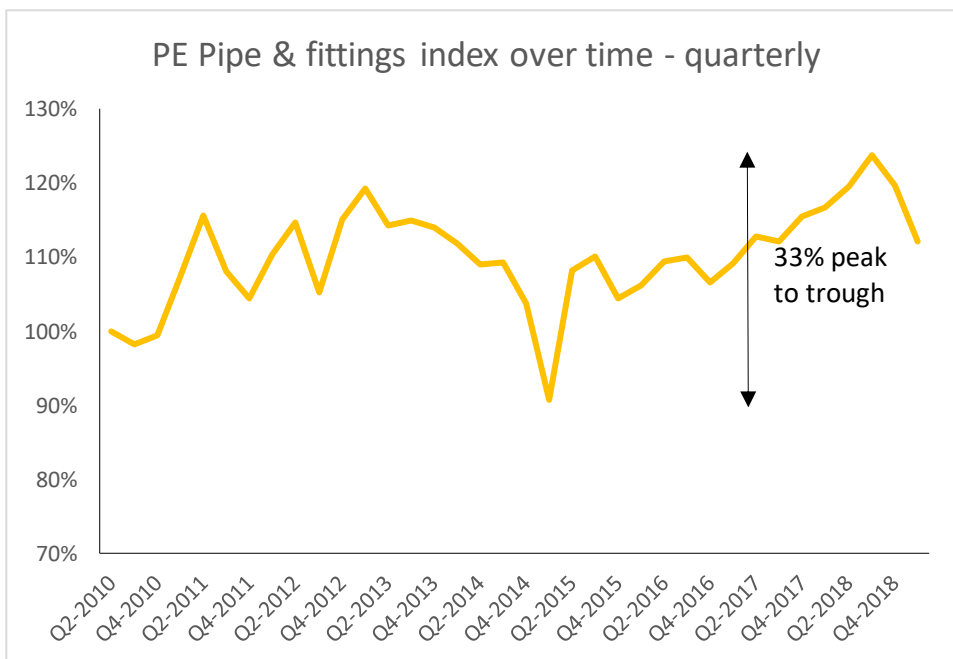
Figure 4: Inflation and PE Pipe and Fittings index



The chart shows a sustained period, between 2014/15 and 2018/19, during which the PE pipe and fittings index was significantly, around 7%, below CPIH. Given that PE pipe & fittings only represent around 2% of controllable totex, this is nowhere near enough to trigger the 0.5% of totex threshold.

However, we only have data for nine years – a far shorter period than for Pay or Plant Hire, and examining the data on a quarterly rather than an annual basis, shows significantly more cost variability, as shown below.

Figure 5: Inflation and PE Pipe and Fittings - quarterly



The quarterly cost variability could be large enough to trigger the 0.5% of totex threshold, for example if allowances were set near the trough, and subsequently stabilised at the peak. Therefore, we consider that there is a case for indexing PE pipe and fittings.

In respect of the selection of an index, there is a choice between:

- a composite index, with a 65% weighting applied to the ICIS London Oil Reports PE 100 index and a 35% weighting for other costs held constant in real terms; and
- the BCIS PAFI pipes & accessories index.

Our first criterion for index selection is accuracy. We consider that the composite index is likely to be a better representation of gas industry costs because it covers only the highest of the five grades of PE, as used in the gas industry. Although the BCIS index covers all the cost, it includes all five grades of PE, including drainpipes for example, which is unlikely to be as accurate.

For our other criteria for index selection, we believe that both potential indices are independent, credible, continuous and produced on a timely basis. However, neither is within the public domain, both need to be purchased.

On balance, we propose that the composite index be applied, on the grounds of better accuracy than the BCIS index, because it only contains gas industry grade PE.

No forecasts are available for the PE100 index, so, given the historic link between oil and gas and PE prices, we have calculated RPEs based on the oil price forecasts contained within the OBR's Economic and Fiscal forecast from March 2019.

A summary of our proposals for indices is shown below.

Table 3: Proposed indices

Cost type	Proposed Index
All Labour	AWE industry sector data
Plant hire	ONS SPPI Construction Plant Hire
PE Pipe & fittings	Composite: 65% weighting to ICIS London Oil Reports PE 100 index: 35% held constant in real terms

We no longer consider that the potential volatility in blacktop costs is sufficiently large to merit indexation.

3.RPE assumptions in the Plan

The proposed indices do not have forecasts out to 2025/26, as such, over the period through to the end RIIO-2 we have used the latest forecast from the Office of Budget Responsibility (OBR), from March 2019 for CPI, labour and oil in the UK, which are provided in the table below along with derived RPEs. For Plant Hire costs, we have assumed that prices will move in line with CPI. From a start point of 2018/19, labour costs are forecast to rise steadily to be 10% above CPI by 2025/26, whereas oil prices are forecast to decline sharply in 2019/20 and only gradually recover, such that by 2025/26 they will have risen by around 20% less than CPI.

Table 4: OBR (March 2019) Price forecasts

	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26
OBR March Forecasts								
CPI growth		2.0	1.9	2.0	2.0	2.0	2.0	2.0
Pay growth nominal		3.0	3.1	3.1	3.2	3.3	3.3	3.3
Oil prices nominal		-8.8	-2.0	-0.1	0.9	1.1	2.0	2.0
Annual RPE								
Labour		1.00	1.20	1.10	1.20	1.30	1.30	1.30
Oil		-10.8	-3.9	-2.1	-1.1	-0.9	0.0	0.0
Change relative to 2018/19								
CPI growth	100	102	104	106	108	110	113	115
Labour	100	103	106	109	113	117	121	125
Oil	100	91	89	89	90	91	93	95

We note that Ofgem intends to apply CPIH rather than CPI, however, since the average gap between the two has only been around 0.1% p.a. since 1989/90 - although it can be significantly more in any individual year - we have assumed in the Plan that they are the same.

With labour costs, both employee and contractors, accounting for nearly 75% of our cost base, we forecast that the Labour RPE will cause an increase in costs of £61m pa by 2025/26. PE pipe costs account for around 2% of our costs, which is heavily, circa two-thirds, dependant on the oil price. Thus we estimate this impact by reducing the oil index by two thirds. With the forecast reduction in oil the price this sees a projected reduction in costs of £4m pa by 2025/26. This is equivalent to an overall increase in Totex, from 2018/19 constant prices to real prices, of 5.7% in 2025/26, with a RIIO2 period impact of 4.4% (0.86% pa). These cost impacts are given in table below

Table 5: Impact of RPE forecasts on Totex

£m, 18/19 prices	19/20	20/21	21/22	22/23	23/24	24/25	25/26
Labour RPE impact	8.3	17.4	25.1	34.9	45.1	53.4	61.4
Oil RPE impact	-2.8	-3.7	-3.8	-4.0	-4.2	-4.2	-4.1
Overall RPE impact	5.5	13.7	21.3	30.9	40.9	49.2	57.2
<i>Totex index</i>	1.005	1.012	1.020	1.028	1.038	1.047	1.057
<i>%increase from 2020/21</i>			0.8%	1.6%	2.5%	3.5%	4.4%

4. Applying RPE indexation

We support the decisions taken by Ofgem in the May 2019 Sector Specific Methodology Decision document to apply a notional cost structure, include forecasts of RPEs within allowed costs, and true-up annually within period to take account of actual indices with a final adjustment after the end of the period.

There is a trade-off between the accuracy of the notional cost calculation and its accuracy. It would be more accurate to apply indexation at the level of individual activities, for example, repair work execution, emergency work execution etc, than at the level of Opex, Capex and Repex. This is because the labour proportions in particular of each individual activity are not the same, and different GDNs will have a different balance between activities. Consequently, a more accurate notional cost structure for each GDN will be provided by calculating RPEs at the level of individual activities.

In contrast, it would be a more straightforward calculation if notional cost structures were calculated at the higher level of Opex, Capex and Repex. However, given that the BPDTs collect cost split data at an individual activity level, we consider that the necessary data should be easily available to Ofgem, in which case a slightly more complex calculation would seem a price worth paying for a significantly more accurate notional calculation i.e. at the level of individual activities.

Once the period has begun, for year n, the relevant indices and actual CPIH would be available in year n+1, so allowances for year n could be recalculated in real terms using these indices. Subtracting the previous value of allowances would give the change in allowances, which would be adjusted by the sharing factor in the Totex Incentive Mechanism and uplifted for two years' compounded WACC. Inserting the resulting number into the PCFM would change allowed revenue for the year n+2.

An example is shown in the table below.

Table 6: RPE indexation example

RPE indexation example	Cost impact year n			Revenue impact n+2	
	Original £	Revised £	change £	Post Sharing £	Two year WACC £
Original allowance - before RPEs	99.0	99.0	0.0		
RPE allowance	1.0	3.0	2.0		
Allowance with RPEs	100.0	102.0	2.0	1.0	1.036

Assumes Totex Incentive Rate of 50%
Assumes Ofgem required WACC of 1.8% p.a.

In respect of changing the forecasts for the remaining years of the period, forecasts are unlikely to be available of the precise indices used, for example at AWE industry sector level. That leaves two alternative ways of updating the forecasts within cost allowances for future years:

- Update to reflect the real price increase of the last actual year: so if the actual real cost increase in year 1 of the price control period is 0.8% more than assumed when the allowances were set, the real change in future years could also be assumed to be 0.8% p.a. and future allowances updated accordingly on a compound basis.
- Update using a reputable but higher level forecast than the actual index. For example, the OBR publishes forecasts every year of economy wide pay increases, CPI and oil prices in its Economic and Fiscal Outlook. By the time of the first update to allowances, due to be calculated in the Autumn of 2022, the forecast should cover the remainder of the five year price control period.

On the basis that the OBR forecast would be expected to be a better representation of the future than assuming that the future exactly matches the recent past, the second approach would appear likely to be more accurate, and so reduce the scale of adjustments required to reflect the difference between forecast and actual costs.

Finally, there is an interaction between RPE indexation and the use of revenue drivers, uncertainty mechanisms, and price control deliverables because RPE indexation acts to change cost allowances year-on-year. Consequently, revenue drivers, PCDs and uncertainty mechanism all need to take account of RPE indexation, by using a notional split of costs which is updated annually by RPE indexation.

We look forward to working further with Ofgem to develop effective mechanisms for applying RPE indexation in RIIO-2.