Northern Gas Networks

A19 - NGN RIIO-2

Real Price Effects for Gas Networks

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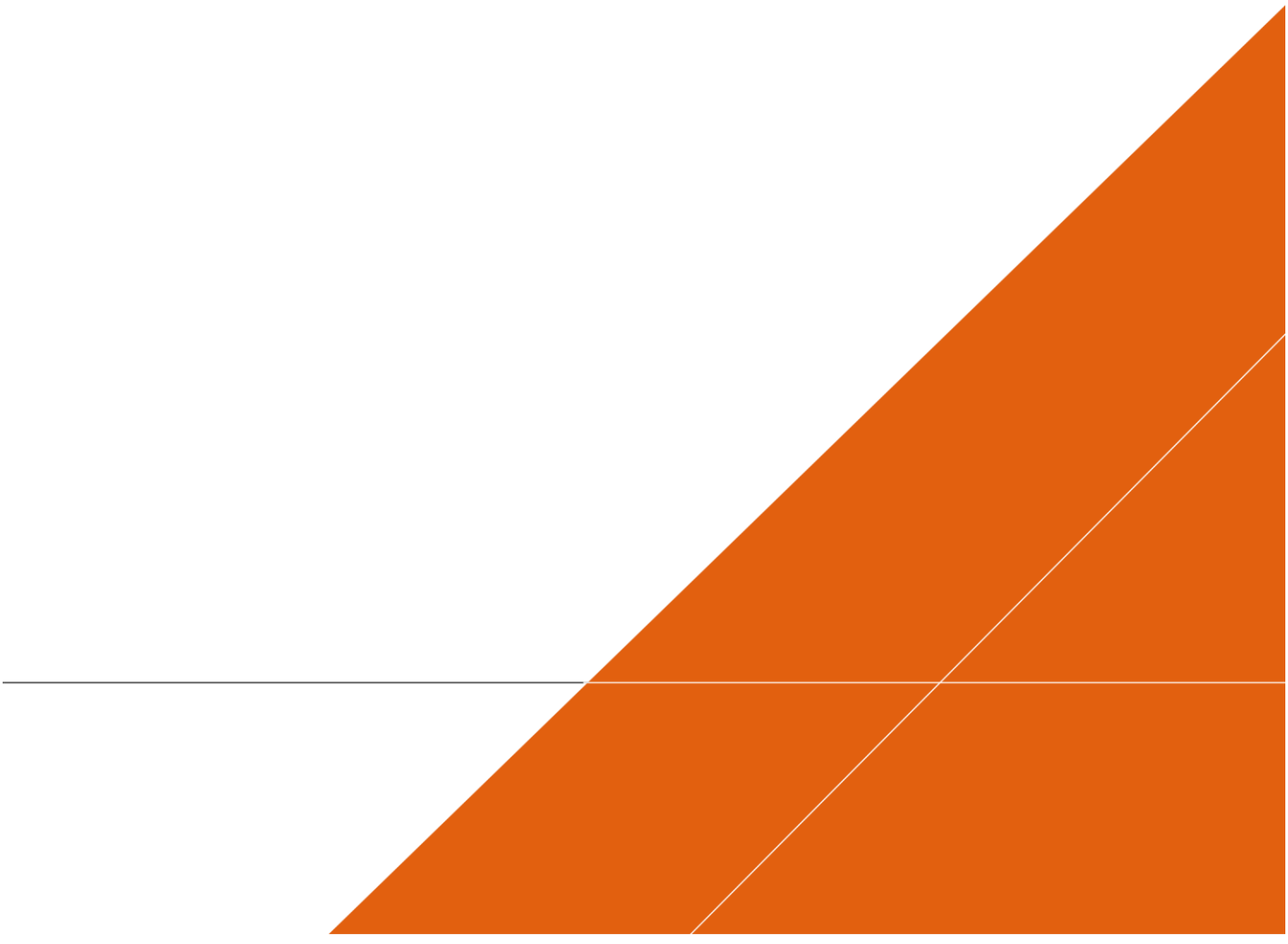
REAL PRICE EFFECTS ANALYSIS

Northern Gas Networks

NOVEMBER 2019



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VERSION CONTROL

Version	Date	Author	Checker	Approver	Changes
0.9	21/11/19	S Rawlinson			
0.95	26/11/19	S Rawlinson			Executive Summary added. Response to comments. Additional detail on annual RPEs added
1.0	29/11/19	S Rawlinson			Minor amends in response to DP e-mails dated 28 and 29 November

CONTENTS

1 Executive summary

Overview

This report has been prepared by Arcadis to support Northern Gas Networks in the preparation of the business plan for RIIO-GD2 – focusing on the identification of appropriate indicators to be applied as part of Ofgem's proposed post-ante inflation assessment mechanism.

The objectives of the report are to:

- Highlight input costs for which CPI is a poor proxy
- Demonstrate the potential for a material and sustained deviation between an index and CPI-H.
- Allocate expenditure categories to Opex, Capex and Repex
- Propose indices that could be used as part of the new system

Operation of the RPE mechanism in RIIO-GD1.

Section 2 of this report provides a brief overview of the operation of the ex-ante RPEs so far in RIIO-GD1. RIIO-GD1 has coincided with a period of significant growth in the output of the infrastructure sector of the construction industry which might be expected to be inflationary. By contrast, the period has also coincided with cyclical variations in the cost of oil, which might be expected to be reflected in the price of PE pipe.

The Totex allowance for RPEs in RIIO-GD1 from 2011/12 to 2020/21 is 0.5%.

The analysis suggests that the RPE indicators selected by Ofgem, summarised in tables 2 and 3, were not effective in picking up any wider inflationary trend in the construction sector. The Arcadis Infrastructure Tender Price Index for example records an average RPE relative to RPI over the period of 0.6%, and much higher levels of inflation on an annual basis since 2016.

We believe that this supports the case for the adoption of alternative RPE indicators for RIIO-GD2, particularly given the move to CPI-H as the cost pressure benchmark.

Material RPEs

The analysis in this report has highlighted the following cost categories has having potential for the application of RPEs. This assessment takes into account the consideration of materiality criteria from section 3. The cost categories are summarised in table 1 below, demonstrating material deviations from the trend tracked by CPI. The suitability of the indices is assessed in section 5.

Category	Value (Totex pa £m)	Suggested Index series	RPE (vs. CPI)	Indicative value over 5 years (£m)
Capex and Repex Labour	109.77	AWE construction	0.8	13.60
Opex Labour – Blue Collar	17.6	AWE EGWS	0.2	0.40
Opex Labour – Blue Collar	17.6	AWE ASS	1.9	2.20
Opex Labour – White Collar	25.0	AWE - PST	(0.8)	(1.50)
PE Pipe	11.65	MM22 – JU06	1.2	0.8

Table 1. Summary of RPE Analysis (2012 to 2019[1]

[1] Data sources for this table are taken from sub-parts of section 3 and the impact assessment included in section 4.

Given the significant differences with the allowances provided the RPE mechanism in RIIO-GD1, we believe that the assessment in this report sets out a strong case for the presence of cost movements affecting efficient GDOs. Furthermore, the analysis in this report demonstrates that CPI-H will not be an effective proxy for these price movements.

RPE materiality threshold

In this assessment, we have taken into account Ofgem's intention to apply a materiality threshold to the use of post-ante RPE indices.

This is detailed in section 2, where we analyse NGN Totex and also model potential inflation scenarios.

Based on this assessment, we have adopted an annual expenditure threshold of £10 million as the NGN-specific materiality threshold. This is equivalent to 4% of Totex. The category selection used in table 1 is discussed in section 2.

Assessment methodology

Four separate assessments have been prepared for labour and materials categories. These are detailed in section 3. The assessment process adopted for each category is as follows:

- Analysis of annual expenditure and allocation to categories.
- Selection of potential indices and calculation of notional RPEs[2]
- Comparison and analysis of annual average RPEs
- Comparison of year-by-year fluctuation in cost escalation

The analysis supports the selection of the index which is the most appropriate proxy for wider cost pressures affecting the delivery of the Totex programme.

Impact assessment

Section 4 of the report features an impact assessment which combines a year on year calculation of the notional RPE for each index considered together with a financial assessment based on current annual levels of expenditure. The results are detailed in table 13. They highlight the potential scale deviation associated categories of Capex/Repex and Opex labour together with PE Pipe. The assessment also demonstrates the potential for a cumulative RPE impact with above trend inflation experienced over a number of years.

Table 13 provides an impact assessment for all index series included in the assessment.

Suitability of the index series

Section five sets out an assessment of the suitability of the index series based on criteria set by Ofgem and CEPA. The preferred indices are highlighted. They are shown to meet *essential* criteria effectively and to score well against most *desirable* criteria.

Further work is required to complete a back-cast of the proposed index series against actual costs to confirm tracking accuracy. In our view, this assessment supports the selection of the proposed indices set out in table 1.

[2] Notional RPEs are calculated on an average annual basis for the period 1Q2012 to 1Q2019. The RPE is calculated on the basis of CPI-H.

2 Analysis of RPEs allowed for in RIIO GD1

This section of the report gives a brief overview of the relief provided by Real Price Effects (RPE) during RIIO-GD1. Real Price Effects are inflationary trends in excess of background inflation that are deemed to be a significant risk as part of a regulatory settlement. In section 2, RPE comparisons are based on RPI. In subsequent analysis, the inflation benchmark is CPI-H.

Ofgem's current decision with respect to RPE was set out in *RIIO-T1/GD1: Real price effects and ongoing efficiency appendix*, published on 17th December 2012.

The methodology adopted by Ofgem is to use a combination of short-term forecasts and long-term trends for the assessment of an ex-ante allowance. RPI was used as the proxy for cost pressure in RIIO-GD1. Initially, Ofgem assumed negative RPEs for 2011 to 2013, which had the effect of reducing the cost base across the sector. Thereafter, the Totex allowance for GDNs was assessed as being 0.5%. The provision of an ex-ante RPE allowance provided certainty to suppliers as well as an element of cost pressure risk transfer. The allowances are calculated as follows:

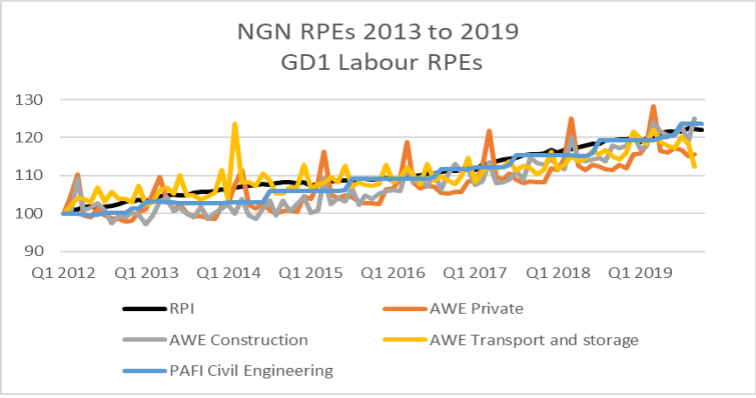
Labour.

- 2011 to 2013. Whole economy wage growth based on HM Treasury consensus forecasts
- 2013 to 2021. An unweighted assessment of wage growth in the private sector and specialist sectors including construction and transport and storage etc, giving a RPE forecast of 1.3%.

In completing their assessment, Ofgem highlighted their methodological choice to exclude utilities sector data from the wage data used to calculate RPEs. This is so that the assessment does not reflect 'inefficient wage settlements' from regulated sectors. Furthermore, Ofgem did not allow for the application of different rates for specialist contractors other than electrical engineers employed on the transmission network.

Materials.

An unweighted combination of outturn and long-term historical trends for a range of infrastructure material inputs including plastic pipes and plant and machinery, sourced from BEIS and ONS. Graphs 1 and 2 plot the movement of the components of the ex-ante assessment against RPI.[3] To keep the analysis simple, the assessment is based in the application of indices for the full period 2012 to 2019 and does not apply the known 2012/2013 data in accordance with Ofgem methodology. This approach is use throughout the report.



Graph 1. Comparison of labour cost trends from RIIO-GD1 RPE Basket

The comparison of labour trends suggests that, over the period, labour cost inflation lagged behind RPI.

By 2019, construction related labour cost inflation is matching the RPI trend. This high-level comparison suggests that Ofgem's labour RPE methodology is unlikely to have provided much protection against sector specific labour cost inflation. Furthermore, the methodology is unlikely to have resulted in an inefficient recovery of sector specific RPEs during the control period.

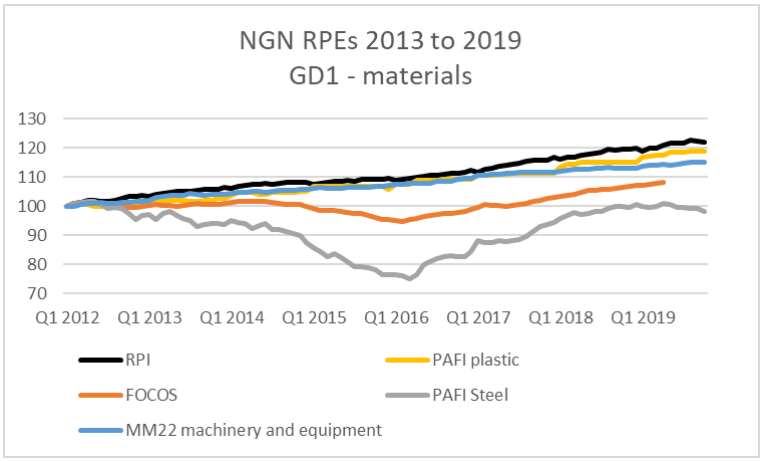
Table 2 provides a simple comparison of the Compound Annual Growth Rate of Wage escalation compared to RPI over the period, highlighting that annual wage growth in all sectors other than Civil Engineering slightly undershot the national inflationary trend over the period.

[3] In the following analysis, AWE refers to the ONS Average Weekly Earnings Survey, PAFI refers to the Price Adjustment Formula Indices published by the BCIS, and PPI refers to the Producer Price Indices, series MM22, published by ONS.

Sector	RPI	AWE Private Sector	AWE Construction	AWE Transport and Storage	PAFI Civil Engineering
CAGR (2012 to 2019) (% pa)	2.6	2.4	2.3	2.2	2.6
Indicative RPE	n/a	(0.2)	(0.3)	(0.4)	0

Table 2. Comparison of CAGR of labour costs (2012 to 2019)

Although none of the earnings trends returns a positive RPE over the period 2012 to 2019, we note that the AWE construction is more cyclical than other wage trends in the comparison. This has potential implications for inflation exposure relative to the timing of expenditure.



Graph 2. Comparison of material cost trends from RIIO-GD1 RPE Basket

The comparison of RPEs adopted for materials demonstrates a similar, more pronounced trend, with the index series used to track price trends within the sector consistently lagging RPI. (Graph 2)

It is worth noting that during the control period there was a significant reduction in the cost of oil and other commodities – highlighted by cost trend associated with steel.

This is likely to have contributed to low levels of overall inflation, albeit short-term fluctuations were more pronounced.

Table 3 provides a simple comparison of the Compound Annual Growth Rate of non-labour cost escalation compared to RPI over the period, highlighting all that material-related indices identified by Ofgem measured inflation below the rate of RPI.

Sector	RPI	FOCOS Infrastructure materials	PAFI Steel Components	PAFI Plastic Pipe	PPI Machinery and equipment
CAGR (2012 to 2019) (% pa)	2.6	1.1	(0.1)	2.3	1.9
Indicative RPE	n/a	(1.5)	(2.7)	(0.3)	(0.7)

Table 3. Comparison of CAGR of materials costs (2012 to 2019)

We observe that the cost trends tracked by the RPEs used for RIIO-GD1 over the period 2012 to 2019 are in most cases significantly below threshold required to result in a 'material' inflationary outcome as outlined in NGN's briefing material for this commission. However, we observe that the costs of externally procured construction are likely to have increased at a premium to RPI. The Arcadis Infrastructure Tender Price Index for example has increased at a CAGR of 3.2% over the period 2012 to 2019, equivalent to an average RPE of 0.6%.

With the adoption of CPI-H as the inflation proxy for RIIO-GD2, the differential between the long-term trend of cost pressure in the sector and the wider economy is likely to increase.

The conclusion of this assessment is :

- over the period, the operation of the RPEs selected by Ofgem are unlikely to have provided protection against sector specific inflation had the system been operated on a post-hoc basis as proposed for RIIO-GD2.
- there is evidence of short-term fluctuation in the costs of materials such as PE Pipe for which an economy-wide cost pressure will not be an effective proxy. We examine alternative indices in section 3.

On both counts, we believe that these factors support the case for a review of the RPEs to be used for the RIIO-GD2 assessment.

The scope of this initial assessment excludes a retrospective comparison of inflationary trends associated actual costs incurred and RPEs. This might necessary to make an evidence-based case for the adoption of alternative indices to the calculation of more representative RPEs.

Analysis of NGN Totex expenditure

As part of an initial assessment of the applicability of existing and potentially new metrics to the assessment of excess inflation risk, we have prepared a simple summary of annual Totex, summarised at a high level in table 4.

NGN - RPE Assessment
Cost category sensitivity assessment

	Capex	Repex	Opex	Total
Direct Labour (Capex)	3.19	6.89		
Direct Labour (Other Capex)	4.20			
Direct Labour (Capex)	**7.39**	**6.89**		**14.28**
Contract Labour (Capex)	19.15	63.50		
Contract Labour (Other Capex)	12.83			
Contract Labour (Capex)	**31.99**	**63.50**		**95.49**
Direct Labour (Opex blue collar)			21.00	
Contract Labour (Opex blue collar)			14.20	
Opex Labour Blue Collar	**0.00**	**0.00**	**35.20**	**35.20**
Direct Labour (Opex white collar)			18.60	
Contract Labour (Opex white collar)			6.40	
Opex Labour White Collar	**0.00**	**0.00**	**25.00**	**25.00**
Professional fees			1.80	**1.80**
Other staff costs			2.60	**2.60**
Other - streetworks			0.60	**0.60**
Other - LP gas holder demolition			1.60	**1.60**
Other - Land remediation			0.70	**0.70**
Other - District Incident			0.80	**0.80**
Property			2.90	**2.90**
Plant and transport			3.90	**3.90**
Materials	3.49	0.61	2.90	**7.00**
Materials - PE Pipe		7.56		**7.56**
xoserve			2.50	**2.50**
Other (Capex)	11.60			**11.60**
Other (Other Capex)	10.96			**10.96**
Other (Repex)		21.21		**21.21**
Other (Opex)			1.80	**1.80**
	65.4295	99.77	82.3	247.4995

Table 4. Summary of NGN Annual Totex Expenditure4

High level overview

The assessment totals annual Totex at approximately £247.5 million. The bulk of this expenditure (£ 170 million, equivalent to 68%) is associated with labour, of which £95.49 million (39%) is externally contracted.

The selection of appropriate labour indices and the development of a case for the recognition of a 'contracted labour premium' is clearly a priority for this exercise.

There is also a total expenditure on materials across Capex, Repex and Totex totalling £14.56 million.

Materiality

NGN's briefing for this commission highlights the importance of *materiality* as a discipline for the selection of expenditure categories for inclusion in a post-ante inflation assessment.

To avoid a profusion of indices, which has been the experience of the application of indices to the costs of 'fully fluctuating' construction contracts, the proposed approach aims to focus on work categories that are large enough and inflationary enough to create a *material inflation risk.*

Our understanding of the boundaries of the definition of materiality have not been set but are likely to be in the range of 0.2% to 0.5% of Totex per category per annum. These thresholds are set out in Table 5 overleaf.

[4] Assessment is based on material provided by David Pearson of NGN during November 2019.

Table 5 summarises the size of Totex necessary to deliver a material inflationary outcome at three rates of inflation. 0.5% of Totex is £1.23 million, whereas 0.2% is £0.50 million.

This analysis shows that even for a low level of RPE such as 2% per annum, the impact on large cost centres associated with labour and some other inputs will result in cost pressures that exceed the materiality threshold.

Materiality Threshold	0.5% of Totex	0.2% of Totex
RPE @ 2% pa	£61 million	£25 million
RPE @ 5% pa	£25 million	£10 million
RPE @ 10% pa	£12 million	£5 million

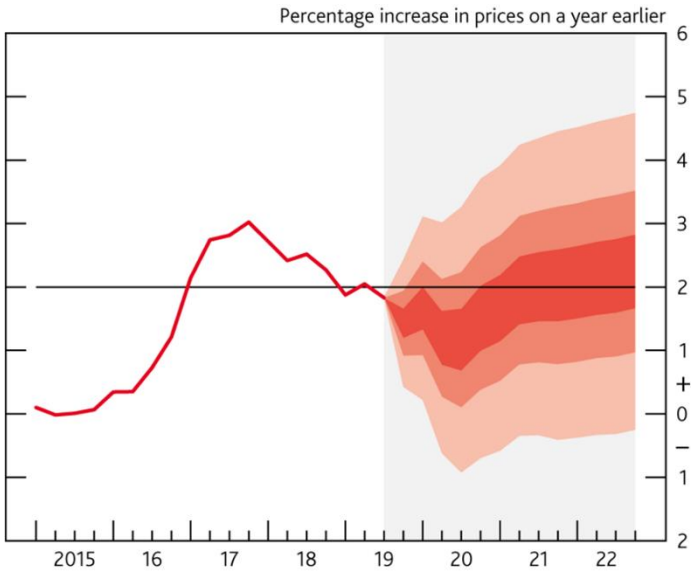
Table 5. Indicative annual assessment of materiality thresholds for the application of RPEs

An additional materiality consideration is the potential for an RPE to compound over a number of years. This is common for Labour RPEs, where earnings growth will often outstrip background inflation. In these instances, a relatively small RPE may have a larger impact over the extended period. The analysis in table 13 on page 20 of this report highlights this trend for labour categories through the modelling of alternative index series against expenditure over the period 2012 to 2018.

Implications of historic trends of RPEs and materiality

In section 2 of this report, the analysis highlights that the indices used to track RPEs during RIIO-GD1 have largely followed the national trend as defined by RPI. This means that the materiality threshold is unlikely to be met unless the cost centres associated with the RPE are a significant subset of Totex expenditure.

Current projections of UK inflation are fairly restrained. Bank of England projections for inflation are for a +/- 1.5% variation around the central CPI target of 2% per annum.



This background suggests that scenarios of 2% and 5% RPE are most likely over the RIIO-GD2 control period.

Based on this assessment, our view is that only cost categories valued over £10 million per annum are appropriate for inclusion in the assessment.

This results in the following categories:

- In-house Capex labour
- Contract Capex labour
- Opex blue collar labour
- Opex white collar labour
- PE Pipe
- Road reinstatement materials

Graph 3. UK wide inflation projections to 2022 (Source Ban of England)

We are aware of the risk of potential wage inflation post-Brexit as a result of constraints in selected labour markets. We have seen recent labour inflation forecasts from the Building Cost Information Service (BCIS) of the RICS, which highlight a risk that national wage awards in the construction sector could exceed 5% per annum from 2022 onwards[5]. At present, there is no evidence for this trend, but BCIS are clearly building

[5] BCIS Briefing - labour cost assumptions. 20 November 2019

new assumptions with respect to the availability of labour into their inflation assumptions that are not in line with Bank of England projections.

This risk highlights the importance of the identification of market specific RPE indices where possible.

3 Identification of potential RPEs for RIIO-GD2

This section of the report presents the findings of an analysis of appropriate inflation metrics to provide data on potential Real Price Effects.

The approach that we have taken has been to identify a wider range of indices than those applied by Ofgem in the original RIIO-GD1 RPE methodology. These are summarised in the following charts and summary tables covering Labour, PE pipe and road surfacing.

Some of the indices proposed are more closely aligned to the gas distribution segment than previously accepted by Ofgem. Ofgem have previously expressed a preference to use index series that are similar to utilities-specific indices, but which do not directly reflect the efficiency/inefficiency of the sector.

We have also considered the stability of the index series as a selection criterion as well as the representativeness of the index series itself. This is most applicable to material cost inputs where the potential amplitude fluctuation of the value of an index could result in greater uncertainty as well as a loss in protection to the consumer.

The assessments included in this section are based on a comparison with CPI-H. The CAGR of CPI-H is lower than RPI @ 1.68% per annum.

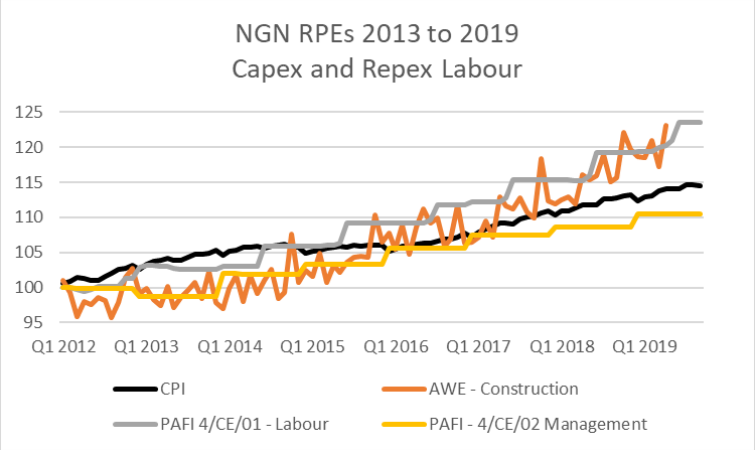
3.1 Capex and Repex labour expenditure

This category is worth £110 million. 86% of value is outsourced to contractors with an inherent additional risk associated with supply/demand in the infrastructure market.

	Capex (£m)	Repex (£m)	Opex (£m)	Total (£m)
Direct Labour	7.39	6.89	-	14.28
Contract Labour	31.99	63.50	-	95.49
Total	39.38	70.49	-	109.77

Table 6. Summary of Capex and Repex Labour (Annual expenditure)

An analysis of inflation trends is set out in graph 4.



Graph 4. Potential Capex Labour RPEs for RIIO-GD2.

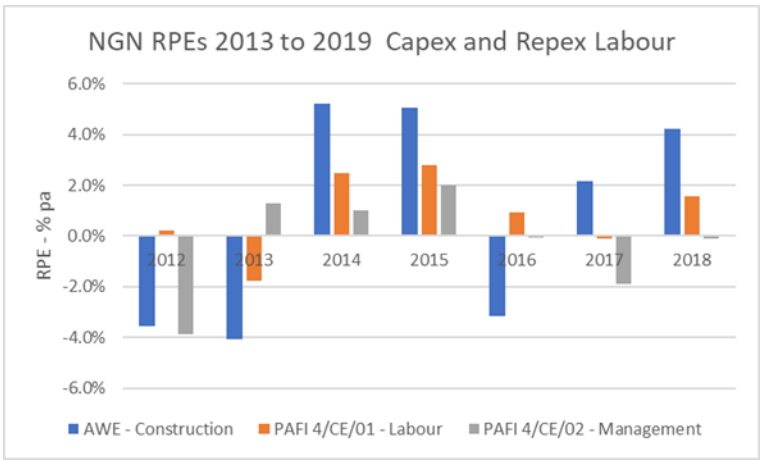
The analysis highlights that when CPI-H is used as the RPE threshold, then typical construction labour cost metrics increase at the higher rate. We have included data from PAFI which is based on national wage awards as well as AWE data. However, the inflationary trend for operatives is similar.

Table 7 includes an indicative assessment of the value of the RPE when compared to CPI-H, which ranges from 0.9 to 1.0%. This confirms that CPI-H is a poor proxy. Based on the discussion in section 3 and the value of the category (£110 m pa), these indices meet the materiality test.

Sector	CPI-H	AWE construction	PAFI Civil Engineering Labour	PAFI Civil Engineering Management
CAGR (2012 to 2019) (% pa)	1.7	2.5	2.6	1.4
Indicative RPE	n/a	0.8	0.9	(0.2)

Table 7. Modelling of CAGRs and RPEs for Capex Labour (2012 to 2019)

Whilst the analysis in Table 7 shows that the CAGR for AWE construction and PAFI construction labour are similar, Graph 4 suggests that construction wages paid is a more variable metric. This reflects market-related factors such as bonuses. The PAFI series is based on a blended rate based on Construction Industry Joint Council (CIJC) Working Rule Agreement. The assessment allows for some overtime but does not include for bonuses. Furthermore, cost trends based on the CIJC agreement do not reflect the earnings of self-employed operatives who account for 40% of the workforce. The plot for AWE construction is cyclical, reflecting supply and demand conditions in the wider industry.



We consider that AWE construction is more representative of the efficient costs of the industry, taking into account the potential for peaks and troughs in activity. A further analysis, examining annual RPEs for Capex and Repex labour is set out in Graph 5.

Annual RPEs for AWE construction exceed 4% in three years during the period 2012 to 2018. However, gross RPE over 7-year period is similar @ 6%. This is a better reflection of cyclical labour cost in the industry.

Graph 5. Annual Capex and Repex Labour RPEs for RIIO-GD2

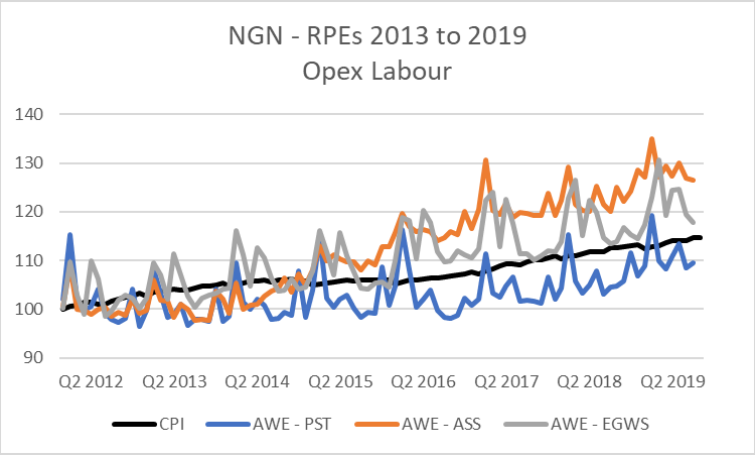
3.2 Other Opex labour expenditure

This category is worth £60 million. Approximately 33% is outsourced.

	Blue Collar (£m)	White Collar (£m)	Total (£m)
Direct	21.00	18.60	39.60
Contract	14.20	6.40	20.60
Total	35.20	25.00	60.20

Table 8. Summary of Opex Labour (Annual expenditure)

Ofgem used AWE Private Sector and AWE Transport and Storage in the ex-ante assessment. We suggest that AWE data more closely linked to the sector is a better proxy for cost trends that affect the employment groups active in NGN.



This assessment uses a range of indices derived from the AWE that have not been considered by Ofgem in previous RPE assessments. The categories considered are:

- Professional, scientific and technical (PST)
- Administrative and support services (ASS)
- Electricity, gas and water supply (EGWS)

Ofgem prefer not to use inflation indicators from the sector. However, this analysis highlights that CPI-H is a poor proxy for relevant Opex labour costs, particularly in connection with the ASS grade.

Graph 6. Potential Opex Labour RPEs for RIIO-GD2

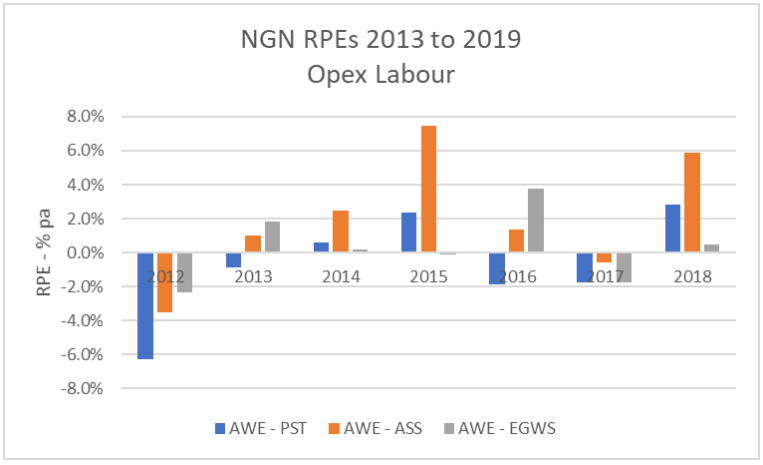
Table 9 highlights that, based on nationally measured data, there have been higher levels of RPE recorded against the ASS segment than measured by the AWE private sector metric (CAGR = 2.4% Table 1).

Based on the need for a responsive proxy, there is a good case for identifying these categories as RPEs. Furthermore, the size of the RPE for ASS (1.9% pa) is large enough to meet the 0.5% materiality threshold if applied across the sector. EGWS cost pressures have been lower over the RIIO-GD1 period and the index is included so that the RPE set is balanced across all of Opex labour.

Sector	CPI-H	AWE PST	AWE ASS	AWE EGWS
CAGR (2012 to 2019) (% pa)	1.7	0.9	3.6	1.9
Indicative RPE	n/a	(0.8)	1.9	0.2

Table 9. Modelling of CAGRs and RPEs for Opex Labour (2012 to 2019)

As both ASS and EGWS categories are likely to represent a significant element of the permanent and contract NGN workforce, we highlight Opex labour as an area where an alternative RPE will be needed to mitigate the risk of labour cost escalation in excess of CPI-H[6]. As the difference between employment types has been so great over the period, we recommend that a combination of indices is used for RIIO-GD2.



Graph 7 highlights the potential for significant discrepancy, particularly for ASS, where the RPE exceeds 6% on two occasions during the seven-year period 2012 to 2018.

Our observation is that there is a strong case for the adoption of a more detailed assessment of Opex labour FTEs.

Graph 7. Annual Capex and Repex Labour RPEs for RIIO-GD2

[6] In the impact assessment we have used a 50:50 split for AWE ASS and AWE EGWS.

3.3 Capex and Repex materials – PE pipe and asphalt.

Expenditure on materials associated with Capex, Repex and Opex totals approximately £15 million. According to the materiality assessment in table 5, this means that the RPE would need to be in excess of 5% to have a significant impact on annual Totex. Ofgem allowed an ex-ante materials RPE of 1.2% for RIIO-GD1.

	Capex (£m)	Repex (£m)	Opex (£m)	Total (£m)
Materials	3.49	0.61	2.90	7.00
Materials (PE Pipe)t	-	7.56		7.56
Total	3.49	8.17	2.90	14.56

Table 10. Summary of Totex materials (Annual expenditure)

We have not yet undertaken an analysis of the breakdown of materials. Our assumption is that expenditure on PE pipe and associated work comprises approximately 80% of total spend on materials. The remainder is primarily focused on asphalt and other materials associated with street works. The following analysis sets out details of a range of direct and indirect trackers of cost pressure affecting the costs of key input materials.

This approach differs from Ofgem's as described in Graph 3 above, which uses a PAFI index to track movement in the sector. This analysis explores a wider range of indices to understand potential trends.

RPEs for PE Pipe

The indices that are tracked for PE pipe are as follows:

MM22 JU09 – Plastic plates, sheets tubes and profile

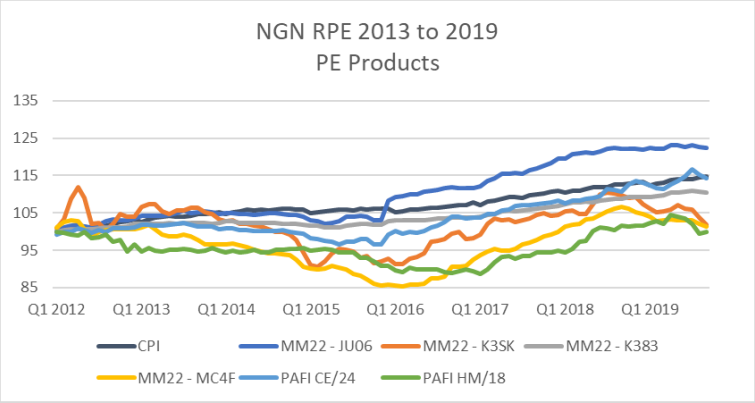
MM 22 MC4F Petro-chemical input materials

MM22 K3SK – Plastics imported from the EU

MM22 K383 – Rubber and plastics products

PAFI 4/CE/24 Plastic products

PAFI 4/HM/R/18 Thermoplastic



Graph 8 shows that cost trends for PE pipe have been volatile during the control period. Accordingly, NGN will have been exposed to short periods of significant inflation over this period.

Any price fluctuations took place against the context of deflation driven by the very low cost of oil during the control period.

Over the period, Ofgem's chosen metric, PAFI, lagged RPE. By contrast, another measure of plastic products, MM22 JU06 saw inflation at a rate slightly above RPI.

Graph 8. Potential Capex and Repex RPEs for RIIO-GD2 – PE Pipe

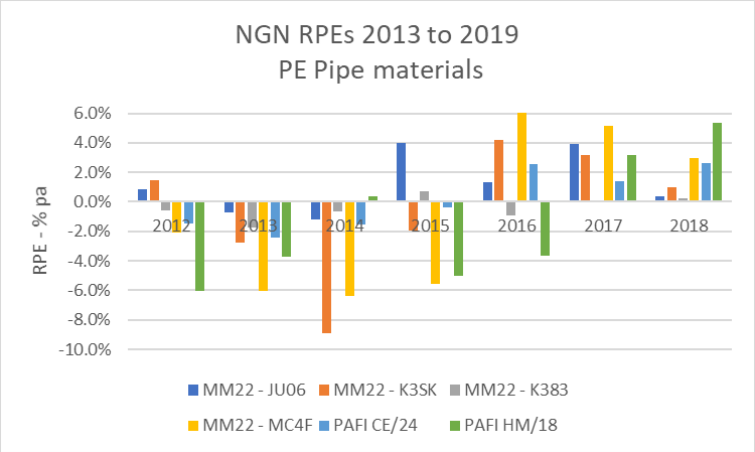
An analysis of CAGR is set out in table 11 below. It is worth noting that none of the inflation trends measured during the control period is sufficiently high over the period to deliver a material change in Totex as defined in section 3. However, some annual variation over the period is significant and should be picked up as an RPE.

Index	CPI-H	MM22 JU06 Plastic Products	MM22 MC4F Inputs into plastic manufacture	MM22 K3SK Plastic products from the EU	MM22 K383 Rubber and plastic products	PAFI 4/CE/24 Plastic Products	PAFI 4/HM/R/18 Thermo-plastic
CAGR (2012 to 2019) (% pa)	1.7	2.9	0.7	1.0	1.3	1.8	0.2
Indicative RPE	n/a	1.2	(1.0)	(0.7)	(0.4)	0.1	(1.5)

Table 11. Modelling of CAGRs and RPEs for Capex and Repex PE Pipe materials (2012 to 2019)

This assessment shows that inflation associated with PE pipes during the control period has been well below the long-term trend adopted by Ofgem. Graph 8 also highlights a significant volatility in prices over the period 2012 to 2019.

This is illustrated in greater detail in Graph 9 below, which highlights the significant variation in positive and negative RPEs over the period as the cost of feedstock fluctuated. It is also worth noting that Ofgem's preferred measured of RPE PAFI CE/24 is most closely tracked by CPI-H.



Graph 9. Annual Totex Materials (PE Pipe) RPEs for RIIO-GD2

This analysis suggests that MM22 JU06 – an index tracking the cost of plastic products as an input cost for other industries is responsive to the cost of inputs and as a result is a better RPE proxy.

We also note that, in the context of a category where cost is highly dependent on feedstock costs, the JU06 index provides a greater level of certainty than other indices compared in this section.

The suitability of this index is considered further in section 5.

Given the potential for further volatility in the price of plastics over RIIO-GD2, we recommend that some additional work is done tracking the actual price paid for PE pipe against the range on indices used in this assessment in order to provide an analysis of tracking error.

RPEs for Asphalt products

We have assumed that Asphalt and related materials comprises the remaining 20% of Totex expenditure allocated to materials (Table 10 refers).

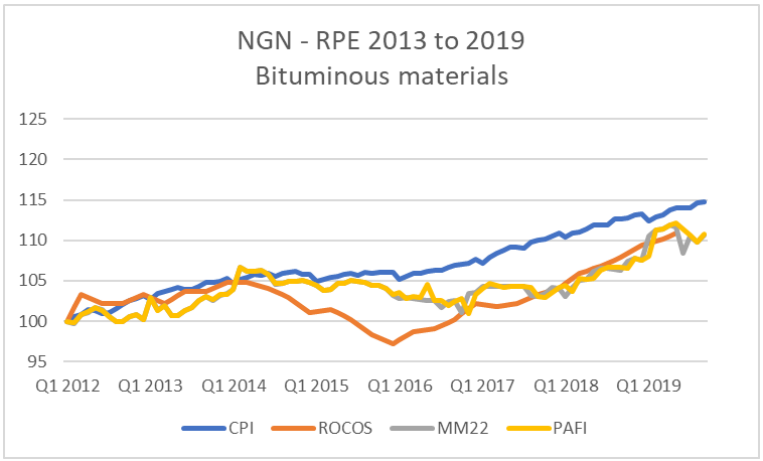
In RIIO-GD1, Ofgem used a related index, FOCOS, to track material input costs associated with civil works. FOCOS tracks material inputs for the entire infrastructure sector and as a result is likely to be based on a very wide range of inputs, not all of which will follow the same cost trend.

For this assessment, we have used the following index series. The results are plotted in graph 10 overleaf

ROCOS – resource cost index for Road Construction (materials)

MM22 JUY6 – bituminous mixtures based on stone

PAFI 4/HM/R/11 Asphalt for paving



The analysis shows that there no positive RPE recorded over the period. The escalation trend is slightly above that set by Ofgem's preferred index. FOCOS recorded a CAGR over the period 2012 to 2019 of 1.1% (negative RPE of 1.5%).

Whilst there is no evidence of a material trend affecting bituminous materials, we consider that there will be the value in having a range of post-ante RPE assessment tools in place to deal with a range of potential outcomes.

Graph 10. Potential Capex and Repex RPEs for RIIO-GD2 – Bituminous materials

The analysis of CAGR is set out in Table 12 below, highlighting a relatively small variation in RPE over the period.

Sector	CPI-H	ROCOS	MM22 JUY6 Bituminous mixtures	PAFI 4/HM/R/11 Asphalt
CAGR (2012 to 2019) (% pa)	1.7	1.3	1.4	1.1
Indicative RPE	n/a	(0.4)	(0.2)	(0.6)

Table 12. Modelling of CAGRs and RPEs for Capex and Repex materials – bituminous products (2012 to 2019)

4 Impact assessment

This section of the report presents an initial assessment of the potential impact of RPEs as a means of mitigating potential inflation risk. This is detailed in table 13, highlighting the significant RPE exposure associated with Capex/Repex labour.

The assessment is based on a back cast of indices from 2012 to 2019. Each % change value is based on the annual average value for indices rather than a single monthly value. The value allocation is based on the analysis detailed in table 4.

The top section summarises the RPE and the bottom section assesses the cost impact. The table includes multiple indices for the same RPE. Values for Opex labour have been partially allocated across the PST, ASS and EGWS bands and as a result, the assessment is indicative.

The analysis highlights that the RPEs operate on a positive and negative basis. Across the five years, the 0.5% materiality threshold (£1.23m pa) is met using BCIS labour indices and the ASS index for Opex Blue Collar. The 0.2% materiality threshold is crossed by labour indices and for PE pipe (2018 and 2019 only).

Assessment of impact of alternate RPEs

Net RPE (% pa)

				Segment Value (£m)	Period 12-13	13-14	14-15	15-16	16-17	17-18	18-19
Direct Labour (Capex)		Construction employment (ONS AWE)		109.77	-2.3	-3.4	8.3	5.4	3.7	-2.6	3.3
Contract Labour (Capex)		BCIS 4/CE/01 - Labour		109.77	-0.7	-0.7	1.7	2.8	1.2	0.4	1.1
		BCIS 4/CE/02 - Management		109.77	-2.5	-2.1	1.7	1.5	0.8	-1.2	-1.0
Opex Labour Blue Collar		EGWS employment (ONS AWE)		17.60	-0.4	-1.9	0.0	3.4	2.1	-1.4	0.2
Opex Labour Blue Collar		ASS employment (ONS AWE)		17.60	-2.3	-3.4	8.3	5.4	3.7	-2.6	3.3
Opex Labour White Collar		PST employment (ONS AWE)		25.00	-4.8	-2.0	1.2	2.1	-3.6	-0.5	1.8
Repex materials	PE pipe	BCIS 4/CE/24 - Plastic products		11.65	-1.3	-1.8	-2.7	-1.7	3.6	1.6	1.5
Capex materials	PE pipe	BCIS 4/HM/R/18 Thermoplastic		11.65	-5.0	-4.6	-0.8	-3.1	-4.1	2.3	5.1
Totex materials	PE pipe	Inputs for petrochemicals	JU09	11.65	-1.3	-0.3	-1.7	1.0	4.8	2.5	1.5
	PE pipe	Inputs for petrochemicals	MB4R	11.65	-3.1	-3.5	-4.1	-3.5	2.0	3.8	2.3
	PE pipe	Inputs for rubber and plastics	MC4F	11.65	-4.0	-5.3	-5.7	-6.1	1.9	6.1	4.2
	PE pipe	Imports European Primary Plastics	K383	11.65	-1.4	-1.3	-1.2	-0.1	0.3	-0.2	0.1
	PE pipe	UK manufactured primary plastic	K3SK	11.65	-2.1	-2.8	-7.7	-4.7	4.4	3.0	1.4
	Road surfa	Bituminous materials	JUY3	2.91	3.3	0.1	0.4	-1.1	-2.1	-1.9	-1.8
	Road surfa	BCIS 4/HM/R/11		2.91	3.3	0.1	0.4	-1.1	-2.1	-1.9	-1.8
	ROCOS materials			2.91	-1.0	-0.6	-2.7	-3.9	0.9	0.2	2.3

RPE total (£m)

				Segment Value (£m)	Period 12-13	13-14	14-15	15-16	16-17	17-18	18-19	5 Year RPE Value (£m)
Direct Labour (Capex)		Construction employment (ONS AWE)		109.77	-2.52	-3.73	9.11	5.93	4.06	-2.85	3.62	13.6
Contract Labour (Capex)		BCIS 4/CE/01 - Labour		109.77	-0.77	-0.77	1.87	3.07	1.32	0.44	1.21	6.4
		BCIS 4/CE/02 - Management		109.77	-2.74	-2.31	1.87	1.65	0.88	-1.32	-1.10	-3.1
Opex Labour Blue Collar		EGWS employment (ONS AWE)		17.60	-0.07	-0.33	0.00	0.60	0.37	-0.25	0.04	0.4
Opex Labour Blue Collar		ASS employment (ONS AWE)		17.60	-0.40	-0.60	1.46	0.95	0.65	-0.46	0.58	2.2
Opex Labour White Collar		PST employment (ONS AWE)		25.00	-1.20	-0.50	0.30	0.53	-0.90	-0.13	0.45	-1.5
Repex materials	PE pipe	BCIS 4/CE/24 - Plastic products		11.65	-0.15	-0.21	-0.31	-0.20	0.42	0.19	0.17	-0.1
Capex materials	PE pipe	BCIS 4/HM/R/18 Thermoplastic		11.65	-0.58	-0.54	-0.09	-0.36	-0.48	0.27	0.59	-1.2
Totex materials	PE pipe	Inputs for petrochemicals	JU09	11.65	-0.15	-0.03	-0.20	0.12	0.56	0.29	0.17	0.8
	PE pipe	Inputs for petrochemicals	MB4R	11.65	-0.36	-0.41	-0.48	-0.41	0.23	0.44	0.27	-0.7
	PE pipe	Inputs for rubber and plastics	MC4F	11.65	-0.47	-0.62	-0.66	-0.71	0.22	0.71	0.49	-1.0
	PE pipe	Imports European Primary Plastics	K383	11.65	-0.16	-0.15	-0.14	-0.01	0.03	-0.02	0.01	-0.4
	PE pipe	UK manufactured primary plastic	K3SK	11.65	-0.24	-0.33	-0.90	-0.55	0.51	0.35	0.16	-1.0
	Road surfa	Bituminous materials	JUY3	2.91	0.10	0.00	0.01	-0.03	-0.06	-0.06	-0.05	-0.1
	Road surfa	BCIS 4/HM/R/11 - Asphalt		2.91	0.10	0.00	0.01	-0.03	-0.06	-0.06	-0.05	-0.1
	ROCOS materials			2.91	-0.03	-0.02	-0.08	-0.11	0.03	0.01	0.07	-0.1

Table 13. Assessment of the value of alternative RPE indices (2012 to 2019)

5 Suitability of the proposed index series

This section presents an initial assessment of the suitability of the indices described in this report according to the criteria advised by Ofgem and CEPA.

Index Series	Simplicity		Credibility		Accuracy		Independence		Transparency		Timeliness	
	Essential	Desirable	Essential	Desirable	Essential	Desirable	Essential	Desirable	Essential	Desirable	Essential	Desirable
Construction wages (ONS AWE)	5	3 (1)	5	Check	5	Check	5	n/a	n/a	4 (2)	n/a	5
Construction wages (BCIS 4/CE/01)	5	3 (1)	5	4	3	Check	5	n/a	n/a	2 (2)	n/a	5
Construction wages (BCIS 4/CE/02)	5	3 (1)	5	4	3	Check	5	n/a	n/a	2 (2)	n/a	5
Blue collar wages (ONS AWE EGWS)	5	3 (1)	5	Check	5	Check	5	n/a	n/a	4 (2)	n/a	5
Blue collar wages (ONS AWE ASS)	5	3 (1)	5	Check	5	Check	5	n/a	n/a	4 (2)	n/a	5
White collar wages (ONS AWE PST)	5	3 (1)	5	Check	5	Check	5	n/a	n/a	4 (2)	n/a	5
PE Pipe (BCIS 4/CE/24)	4 (3)	5	5	4	5	Check	5	n/a	n/a	4 (2)	n/a	5
PE Pipe (BCIS 4/HM/R/18)	4 (3)	5	5	4	5	Check	5	n/a	n/a	4 (2)	n/a	5
PE Pipe MM22 JU06	3.5 (3)	5	5	4	5	Check	5	n/a	n/a	4 (2)	n/a	5
PE Pipe MM22 MB4R	2.5 (4)	5	5	4	5	Check	5	n/a	n/a	4 (2)	n/a	5
PE Pipe MM22 MC4F	2.5 (4)	5	5	4	5	Check	5	n/a	n/a	4 (2)	n/a	5
PE Pipe MM22 K383	2.5 (4)	5	5	4	5	Check	5	n/a	n/a	4 (2)	n/a	5
PE Pipe MM22 K3SK	2.5 (4)	5	5	4	5	Check	5	n/a	n/a	4 (2)	n/a	5
Bituminous materials MM22 JUY3	4 (3)	5	5	4	5	Check	5	n/a	n/a	4 (2)	n/a	5
Asphalt BCIS 4?HM/R/11	4 (3)	5	5	4	5	Check	5	n/a	n/a	4 (2)	n/a	5
ROCOS materials	4	5	5	4	5	Check	5	n/a	n/a	4 (2)	n/a	5

Table 14. RPE index suitability assessment

Real price effects analysis

We have used a simple 5-point scale to make the assessment, with 5 representing a high scoring outcome. The footnotes to the table below set out an explanation to some of the rankings.

The outstanding checks are associated with the representativeness of the index tracking

Footnotes:

(1) Industry specific index and as a result potentially records efficiency/inefficiency of the construction and utilities sectors.

(2) No forecasts available to meet the criteria

(3) Producer price index – input costs only

(4) Manufacturer input cost assessment – does not track costs to NGN

The analysis confirms that most of the proposed indices score highly against Ofgem's criteria. The sector specific labour indices may not be acceptable due to the application of the efficiency/inefficiency consideration.

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