# CMA RPEs methodology in the NIE inquiry

## APPLICATION OF CMA INPUT INDICES TO GB DNOS

## Introduction and summary

Ofgem published the RIIO-ED1 draft determination for the slow-tracked electricity distribution network operators (DNOs) on 30 July 2014. As part of this publication, Ofgem set out its draft real price effects (RPE) allowances for the DNOs. The indices and methodology used by Ofgem differ substantially from those used by the Competition and Markets Authority (CMA) in its final determination for the Northern Ireland Electricity (NIE) price determination, which was published on 26 March 2014.[1]

The five slow-tracked DNOs, via the Energy Networks Association, have asked us to determine what the slow-tracked DNOs' RPE allowances would have been if at draft determination Ofgem had used the approach the CMA took in the NIE inquiry. We have done this by applying the indices and methodology used by the CMA to Ofgem's RIIO-ED1 modelled costs for the slow-tracked DNOs.

There are some instances where we were unable to directly apply the CMA's approach from the NIE inquiry. For example, the RIIO-ED1 time period is different to the one the CMA considered under the NIE inquiry, and more data is now available since the CMA performed its analysis. We have therefore had to infer how the CMA would have made use of this extra data in a way that was consistent with its application to NIE. The table below shows a complete list of the instances where we have had to make assumptions about how the CMA approach should be applied to the GB DNOs; further detail is provided in the section that describes our methodology. We note that the CMA may not have taken this approach if faced with the same data in the NIE inquiry.

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[1]     At the time of the NIE inquiry the CMA was called the 'Competition Commission'. For ease we refer to it as the 'Competition and Markets Authority' throughout this note.

Draft

**Table 1.** Assumptions in relation to application of CMA approach

| Element of approach | CMA's appraoch in NIE inquiry | Our application of CMA's approach |
|---|---|---|
| **2013/14 nominal wage growth** | For its 'historic forecasts' the CMA used a growth rate of 3.25%. It decided to use a slightly reduced figure compared to the GB DNOs' average wage settlements, as ONS ASHE data for relevant occupations showed lower growth than the wage settlements. | We have assumed that the average of the DNOs' wage settlements for 2013/14 should be used. We have looked at the ONS ASHE figures for the relevant occupations and do not consider than an adjustment should be made because of that data. |
| **2019/20 until 2022/23 nominal wage growth** | The CMA used the OBR's December 2013 publication. The OBR forecasts for wage growth were available for the whole of the CMA's forecast period. | We assumed that the most recent OBR publication from March 2014 should be used. The OBR's forecasts do not cover the whole RIIO-ED1 forecast period. We have assumed that an average of the OBR's forecasts from 2014/15 until 2018/19 should be used. |
| **2014/15 until 2022/23 nominal inflation for other inputs** | The CMA used a long-term historical average growth rate from 1996 until 2012. | There is now one additional year of data for these indices. We have assumed that a long-term historical average growth rate from 1996 until 2013 should be used. |
| **2014/15 until 2018/19 RPI growth** | The CMA used the OBR's December 2013 publication. The OBR forecasts for Q3 of each year were used, as NIE's RPE allowances were calculated on an October-October basis. | We assumed that the OBR publication from March 2014 would be used. We have assumed that the OBR RPI forecasts for Q2 of each year should be used as the DNOs' RPE allowances are set on an April-April basis. |
| **2019/20 until 2022/23 RPI growth** | The OBR forecasts for RPI growth were available for the whole of the CMA's forecast period. | The OBR's forecasts do not cover the whole RIIO-ED1 forecast period. We have assumed that an average of the RPI growth forecasts for 2014/15 until 2018/19 should be used. |

Source: Frontier Economics

Our analysis shows that, if at draft determinations Ofgem had used the input indices adopted by the CMA in the NIE inquiry, the industry-wide RPE allowance would increase by £175m. The table below shows this headline result, and how the allowances compare to the ones in the draft determination.[2] It also shows what the RPE allowances would be if Ofgem had used the CMA's input indices, and used industry average weights. We have run this test as we understand that the Ofgem precedent is to use industry average weights rather than DNO specific weights, as the CMA did. The results of four further sensitivities are included in the table below, an explanation of these tests is provided later in this note.

**Table 2.** Industry total RPE allowances[3]

| Approach | Industry total RPE allowances (£m) | Difference to Ofgem draft determination (£m) |
|---|---|---|
| **Ofgem draft determination** | -77.9 | 0 |
| **Headline result – CMA approach (i.e. DNO specific weights)** | 97.2 | +175.1 |
| **CMA input indices, and industry average weights** | 87.4 | +165.3 |
| **CMA approach, with adaptation to its estimation of RPI forecasts** | 265.5 | +343.4 |
| **CMA approach, with 2014/15 wage settlements** | 173.0 | +250.9 |
| **CMA approach, with NIE's materials split** | 138.2 | +216.1 |
| **CMA approach, with adjustment to OBR's RPI forecast** | 369.3 | +447.2 |

Source: Frontier Economics

While this work will provide a useful benchmark, it is important to note that in the event of an appeal, the CMA would not necessarily apply the approach it adopted for NIE.

The remainder of this note is structured as follows:

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2    Note that Ofgem first sets a RIIO-ED1 cost allowance, excluding RPEs, and then sets its RPE allowances. The figures in the table below are these RPE allowances, i.e. the figures are adjustments relative to Ofgem's cost allowance excluding RPEs.

3    Note that these sensitivities are not cumulative.

- overview of the CMA methodology;

- RPE allowances using the CMA's methodology and indices;

- additional sensitivities; and

- conclusion.

## Overview of the CMA methodology

To forecast overall capex and opex RPEs for NIE, the CMA first split NIE's costs into five input categories, based on those used by Ofgem at DPCR5. These input categories were:

- labour;

- general materials (construction materials excluding metals);

- specialised materials (including cables, cable containment, transformers and switchgear);

- plant and equipment (including equipment used on site but not integral to the networks); and

- other.[4]

NIE submitted to the CMA that it should split labour into general labour and specialised labour, where specialised labour would attract a higher RPE. However, the CMA did not use this split for NIE as it believed that "in many instances the distinction between the two categories would be arbitrary."[5]

The RP5 period for NIE began in April 2012, and in its decision the CMA set NIE's revenue from April 2012 until September 2017. Given that the CMA made its final decision in March 2013, it set allowances for 2012/13 retrospectively. The price base year of NIE's revenue control is 2009/10. As such, the CMA forecast RPEs from October 2010 until the end of the revenue control in September 2017.[6]

As the price control for NIE had already started, the CMA was able to base its RPE estimates for past years on actual data (or in the case of some cost heads, in

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[4]    Paragraph 11.30, Competition Commission, Northern Ireland Electricity Limited Price Determination, Final Determination, Notified 26 March 2014

[5]    Paragraph 11.37, Competition Commission, Northern Ireland Electricity Limited Price Determination, Final Determination, Notified 26 March 2014

[6]    The CMA used the RPI index from October to calculate annual RPI growth because NIE sets tariffs on an annual basis, with October as the starting month. The CMA decided to align the timing of the new revenue control to NIE's price setting basis, and in turn this meant that the RPI calculations should work on the basis of October being the first month of the year.

particular indirect costs, undertake analysis on more up to date data that the effect of setting a later base year). Estimates for past years covered the years 2010/11 to 2012/13, and were termed 'historic forecasts'. The CMA's estimates for future years (2013/14 to September 2017) were termed 'forward looking forecasts'.[7] For general materials, specialised materials and equipment and plant, the CMA based its forecast of nominal input price inflation on a long-term average growth rate over the years 1996-2012.

The CMA estimated a historic and forward looking RPE allowance for each of the above input categories. The CMA's methodology followed three steps:[8]

- first it forecast nominal price inflation for the input category;

- second, it compared its forecast of nominal price inflation to the RPI to determine an RPE for each input category; and

- finally, it weighted each input category to reach an aggregate RPE, with different weights applied for capex and opex (see **Table 4** below).

## Data used

For each input category, the CMA used what it described as the best data source(s) available to enable it to estimate the quantum of RPE most appropriate to the category. These sources were primarily:

- the Office for Budget Responsibility's (OBR's) economic and fiscal outlook from December 2013, which was used to estimate labour RPEs; and

- producer price inflation indices to estimate material, plant and equipment RPEs.

The data sources for the CMA's 'historic and forward looking forecasts' are set out in **Table 3** below for each cost category.

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[7]    Financial years were used, running from April to March, with a six month forecast used for the period April 2017 to September 2017 (the end of the revenue control period).

[8]    Paragraph 11.31, Competition Commission, Northern Ireland Electricity Limited Price Determination, Final Determination, Notified 26 March 2014

**Table 3.** Data used by the CMA in its RPE forecasts

| Input | Data source(s) used | Notes |
|---|---|---|
| **Labour** | *'Historic forecasts':* GB DNO wage settlements and ONS ASHE data<br><br>*'Forward-looking forecasts':* OBR | The CMA did not distinguish between specialised and general labour, as set out above. |
| **General materials** | BIS: Resource Cost Index of Infrastructure Materials (FOCOS)<br><br>BIS: Resource Cost Index of Building (non-housing) Materials (NOCOS) | An un-weighted average was calculated when the CMA used multiple price indices.<br><br>*'Historic forecasts':* The CMA used actual growth rates.<br><br>*'Forward-looking forecasts':* The CMA calculated a long-term average growth rate over the years 1996-2012. |
| **Specialised materials** | ONS PPI: Electric motors, generators and transformers; electricity distribution and control equipment (JV6R)<br><br>ONS PPI: Electricity distribution and control apparatus (JV72)<br><br>ONS PPI: Other electronic and electric wires and cables (K32F)<br><br>ONS PPI: Cold Drawn Wire (JV2C)<br><br>BEAMA: Materials in Electrical Engineering | |
| **Plant and equipment** | ONS PPI: Machinery and equipment output<br><br>BCIS: Plant and Road Vehicles (90/2) | |
| **Other** | *'Historic forecasts':* ONS: RPI<br><br>*'Forward-looking forecasts':* OBR: RPI | The CMA assumed that 'other' costs inflated at the same rate as the RPI. |

Source: Competition Commission, Northern Ireland Electricity Limited Price Determination, Final Determination, Notified 26 March 2014

Having estimated the RPEs in each cost category, the CMA weighted its estimates to reach an aggregate RPE for capex and opex. The CMA used NIE's actual input weights as shown in **Table 4**.

**Table 4. NIE's actual weights**

|  | Capex | Opex |
|---|---|---|
| **Labour** | 52.8 | 77.3 |
| **General materials** | 11.6 | 7.7 |
| **Specialised materials** | 18.6 | 0 |
| **Plant and equipment** | 5.9 | 0 |
| **Other** | 11.0 | 15.0 |

NIE Statement of Case, 10 May 2013, p. 218

The CMA rejected the Utility Regulator's proposal to use a notional company structure based on Ofgem's weightings from DPCR5, in which Ofgem averaged the cost weights across the electricity DNOs' business plans. The CMA stated that it used NIE's own weightings as these reflect the characteristics of its business, and it considered the risk of NIE changing its input weightings to improve future RPE allocations very low.

# RPE allowances using the CMA's approach and indices

We have applied the methodology and input indices used by the CMA in the NIE inquiry to Ofgem's modelled costs for the slow-tracked GB DNOs. Given that the base year of RIIO-ED1 is 2012/13, it is necessary to calculate a RPE index from 2013/14 until 2022/23 in order to set RPE allowances for the price control period.

The remainder of this section describes:

- the approach we took to calculating RPE allowances; and

- the results of our analysis.

## Approach used

- **Nominal price growth.** We estimated nominal price inflation for each of the five input categories that the CMA used for 2013/14 until 2022/23, using the same indices as the CMA. Our dataset for the input indices, except

for labour, had an additional year of data to the one used by the CMA, and we also used the most recent OBR forecast from March 2014.[9]

□    For RIIO-ED1, Ofgem has treated 2013/14 as an actual year, so we applied the CMA's approach for 'historic forecasts' and used actual rates of inflation for this year. In the case of general materials, specialised materials, and plant and equipment we used actual nominal inflation for 2013/14 as per the relevant CMA indices.

In the NIE inquiry, the CMA used a combination of the GB DNOs' average wage settlements and information from the ONS ASHE dataset for its estimate of nominal labour inflation. The CMA looked at the growth rates of what it considered to be relevant occupations in the ASHE dataset and concluded that these were in general lower than the average of the DNOs' wage settlements. It decided to use a figure of 3.25% rather than use the average of the DNOs' wage settlements directly, which was 3.4%. We looked at the 2013 growth rates of the occupations that the CMA considered; these are shown in the table below.[10] There are a number of occupations that have higher growth rates than the average of the GB DNOs' wage settlements for 2013/14, which was not the case for the time period considered in the NIE inquiry.

**Table 5.** 2013 growth rates of occupations considered by the CMA

| Occupation | Growth rate in weekly gross pay (%) |
|---|---|
| Professional occupations (2) | 0.5 |
| Engineering professionals (212) | 2 |
| Electrical engineers (2123) | -1.2 |
| Electronics engineers (2124) | 4.6 |
| Electrical and electronics technicians (3112) | -5.7 |
| Engineering technicians (3113) | 0.7 |

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9      The CMA used the OBR forecast from December 2013.

10     Note that the CMA used its figure of 3.25% for each of the three years of 'historic forecasts' (i.e. 2010/11 until 2012/13). It looked at the growth rates in the ONS ASHE dataset for 2010 and for 2012. We have therefore replicated its approach by comparing the 2013/14 wage settlements with the 2013 figures from the ONS ASHE data.

| | |
|---|---|
| Building and civil engineering technicians (3114) | 9.5 |
| Skilled metal, electrical and electronic trades (52) | 2.7 |
| Electrical and electronic trades n.e.c. (5249) | 4.7 |
| Electricians and electrical fitters (5241) | 4.2 |
| Skilled construction and building trades (53) | 1.7 |

Source: ONS ASHE, Provisional 2013 results, Table 14.1a   Weekly pay - Gross (£) - For all employee jobsa: United Kingdom, 2013

On the basis of this, we used the average of the GB DNOs' wage settlements for 2013/14 nominal labour inflation.[11] We note that it is possible that the CMA would have chosen a different approach had it faced the same data.[12]

▫ For the remainder of the period, we used the CMA's approach for 'forward-looking forecasts'. In the case of general materials, specialised materials, and plant and equipment we calculated a long-term average growth rate over the years 1996-2013 (our extra year of data allowed us to calculate our average over a slightly longer time period than did the CMA for NIE. Note it is possible that the CMA may have chosen to adopt a rolling window for estimation, shifting the start year so as to retain an estimate over the same number of years, but we estimate the difference between the approaches to be small). For labour inflation, we used the OBR forecasts until 2018/19, and for 2019/20 until 2022/23 we used an average of the OBR forecasts from 2015/16 until 2018/19.[13]

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[11]  This average includes all DNOs. The wage settlement data for WPD was provided by Scottish Power; we understand that Scottish Power had found this information in a publically available source.

[12]  We have not included 2014/15 wage settlements in our headline result because our remit was to estimate what the RPE allowances would have been if Ofgem had adopted the CMA's approach at draft determinations. At the time of draft determinations Ofgem would not have had the data on actual wage settlements for 2014/15 for all DNOs. However, if Ofgem were to adopt the CMAs' approach at final determinations, it would be within the spirit of the CMA's approach to use actual data for 2014/15 where it was available. If the pay deals for 2014/15 are settled for all of the DNOs by the time of final determinations, and Ofgem adopted the CMA's approach, it could be expected to use the data on 2014/15 wage settlements. We have tested the impact of this as a sensitivity, further details of which are provided below, and it shows that this increases the RPE allowances for the industry by £76m compared to our headline result.

[13]  We could not use OBR forecasts for the full length of the RIIO-ED1 period, because the most recent OBR publication only includes forecasts until 2018/19. The CMA did not have to do this, as the OBR forecasts covered the whole period that the CMA required in the NIE inquiry.

We note that it is possible that the CMA would have chosen a different approach had it faced the same issue.

- **Real price growth and input indices.** We then compared the nominal rates of inflation of each of the input categories to the RPI to determine the real rates of price growth.[14] We used the CMA's methodology to generate our RPI forecast. As with the nominal input forecasts, we used actual RPI growth for 2013/14 and the OBR forecasts for 2014/15 until 2018/19. For the remaining four years (i.e. 2019/20 – 2022/23) we used the average of the growth rates of the years 2015/16 – 2018/19. Again, we note that this extra step in the process was not needed by the CMA and it may have chosen a different approach had it faced the same issue in the NIE inquiry.

We note that Ofgem made an adjustment to its forecasts of real input price growth, to take account of the step-change in RPI growth from 2010. We understand that this adjustment was necessary because Ofgem used long-term <u>historical</u> average real growth rates as its forecasts of future real growth rates. This approach implicitly uses the long-term historical average RPI growth. Ofgem concluded that an adjustment was necessary because the long-term historical average RPI growth rate was not a good forecast of future RPI growth (due to the step-change in RPI growth in 2010). Given that the CMA's approach uses the OBR's forecasts of future RPI growth to determine its real price growth forecasts, it already takes account of this step-change in RPI growth. As such, no RPI adjustment is required in our analysis.

The table below shows the resulting input indices. As highlighted above, the base year for RIIO-ED1 is 2012/13. The indices for 2013/14 are 100 because this year is an actual year in the RIIO-ED1 price control, which means that by definition a RPE adjustment is not required for this year.

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[14]    Our approach mirrors the CMA's approach, apart from the fact that we calculated annual RPI growth from April to April, whereas the CMA calculated annual RPI growth from October to October, as explained earlier.

**Table 6.** Input indices 2013/14 - 2022/23

| Year | Labour | General materials | Specialised materials | Plant and equipment | Other |
|---|---|---|---|---|---|
| 2013/14 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| 2014/15 | 100.40 | 98.67 | 95.24 | 98.41 | 100.00 |
| 2015/16 | 100.85 | 99.02 | 94.56 | 97.11 | 100.00 |
| 2016/17 | 101.61 | 99.28 | 93.79 | 95.74 | 100.00 |
| 2017/18 | 102.28 | 99.34 | 92.85 | 94.19 | 100.00 |
| 2018/19 | 102.82 | 99.39 | 91.91 | 92.67 | 100.00 |
| 2019/20 | 103.43 | 99.58 | 91.09 | 91.28 | 100.00 |
| 2020/21 | 104.05 | 99.76 | 90.29 | 89.92 | 100.00 |
| 2021/22 | 104.67 | 99.94 | 89.49 | 88.58 | 100.00 |
| 2022/23 | 105.29 | 100.13 | 88.69 | 87.26 | 100.00 |

Source: Frontier Economics

For comparison, we also provide below the input indices that Ofgem used in its draft determination. We note that these are not all directly comparable as Ofgem did not use the same input categories as the CMA.

**Table 7.** Ofgem input indices used in draft determination 2013/14 - 2022/23

| Year | Gen. Lab. (cap) | Gen. Lab. (opex) | Spec. Lab. (cap) | Spec. Lab. (opex) | Mat. (cap) | Mat. (opex) | Equip. /Plant | Tranp. | Other |
|---|---|---|---|---|---|---|---|---|---|
| 13/14 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| 14/15 | 98.36 | 98.36 | 98.60 | 98.60 | 95.86 | 98.68 | 97.09 | 99.20 | 99.20 |
| 15/16 | 98.14 | 98.14 | 98.37 | 98.37 | 96.67 | 99.92 | 95.87 | 98.80 | 98.80 |
| 16/17 | 98.54 | 98.54 | 99.38 | 99.38 | 97.48 | 101.18 | 94.67 | 98.41 | 98.41 |
| 17/18 | 98.95 | 98.95 | 100.39 | 100.39 | 98.30 | 102.45 | 93.48 | 98.02 | 98.02 |
| 18/19 | 99.35 | 99.35 | 101.42 | 101.42 | 99.13 | 103.74 | 92.30 | 97.62 | 97.62 |
| 19/20 | 99.76 | 99.76 | 102.46 | 102.46 | 99.96 | 105.05 | 91.14 | 97.23 | 97.23 |
| 20/21 | 100.17 | 100.17 | 103.50 | 103.50 | 100.80 | 106.37 | 89.99 | 96.84 | 96.84 |
| 21/22 | 100.58 | 100.58 | 104.56 | 104.56 | 101.65 | 107.71 | 88.86 | 96.46 | 96.46 |
| 22/23 | 100.99 | 100.99 | 105.63 | 105.63 | 102.51 | 109.07 | 87.75 | 96.07 | 96.07 |

Source: Ofgem analysis

- **RPE index for cost categories.** For each DNO, we calculated a RPE index for each of the following cost categories by weighting the input categories with the DNO's own weights:

  - load-related capex;

  - non-load relatex capex (asset replacement);

  - non-load related capex (other);

  - faults;

  - tree cutting; and

  - controllable opex.

  We also calculated a RPE index for totex, by weighting across these six cost categories, using each DNO's own weights.[15]

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[15]    This approach differs slightly to the CMA's approach in the NIE inquiry. The CMA only calculated a RPE index for two cost categories: capex and opex. We adopted our approach due to the nature of the data that is available to us, i.e. we have costs broken down at a more disaggregated level than did the CMA for NIE. We do not consider this would significantly affect the results.

- **Monetary allowances.** We used these RPE indices to calculate monetary allowances for the DNOs. In-line with Ofgem's cost assessment process, and using Ofgem's modelled costs we calculated a weighted average of monetary allowances across Ofgem's three benchmarking models.[16] We applied Ofgem's weighting (i.e. 25% to each of the totex models and 50% to the disaggregated model) to these monetary allowances to determine the final RPE allowance for each of the DNOs.

## Results

The table below shows the RIIO-ED1 RPE allowance for the industry as a whole, and how this compares to Ofgem's draft allowances.

**Table 8.** RPE allowance for GB DNOs under the draft determination and using CMA approach

| Approach | Industry total RPE allowance (£m) |
|---|---|
| **Ofgem draft determination** | -77.9 |
| **CMA approach** | 97.2 |
| **Difference to draft determination** | +175.1 |

Source: Frontier Economics

### *Drivers of the difference*

There are some important differences between the Ofgem methodology and the CMA methodology that we have adopted in our analysis, which are best explained via a step-by-step description of the two methodologies.

- **Stage 1: Input categories.** There are differences in the input categories used by Ofgem and the CMA.

    Ofgem used the following input indices:

    □ general labour;

    □ specialist labour;

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[16] Specifically, for each of Ofgem's two totex models we applied the RPE index for totex to modelled totex to determine the monetary allowance. For the disaggregated models, we applied the RPE index of the relevant cost category to the disaggregated modelled cost to determine the monetary allowances for each of the disaggregated models. (NB: By relevant cost category, we mean the cost category as used by Ofgem in its RPE calculation.) The sum of these amounts is the RPE allowance for the disaggregated model.

- materials (capex);

- materials (opex);

- equipment and plant;

- transport; and

- other.

In contrast, the CMA used the following input indices:

- labour;

- general materials;

- specialised materials;

- plant and equipment; and

- other.

- **Step 2: Input indices – to estimate real price growth.** Ofgem uses a long-term average of historical <u>real</u> input price growth rates to forecast RPEs. In contrast, the CMA calculates RPEs by deducting its forecast of the RPI from the nominal price growth rates it estimates for each input. Ofgem is therefore implicitly using a long-term historical average RPI measure as its RPI forecast.[17] To the extent that the long-term historical average RPI differs from forecast RPI, this amounts to a difference between the two approaches.

  Even if there was no difference in the use of the RPI, and the same set of input categories had been used, there could still be a difference in the choice of indices. For example, the index used by the CMA for plant and equipment is not the same as that used by Ofgem.

  The most material difference is in the labour indices. The chart below shows that the CMA used a method that results in higher rates of assumed real wage growth than has been assumed by Ofgem.

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[17]    As explained above, this means that in contrast to Ofgem's approach, the CMA's approach already takes account of the step-change in RPI growth. Therefore an equivalent of Ofgem's RPI adjustment is not required in our analysis.

**Figure 1.** Labour indices[18]
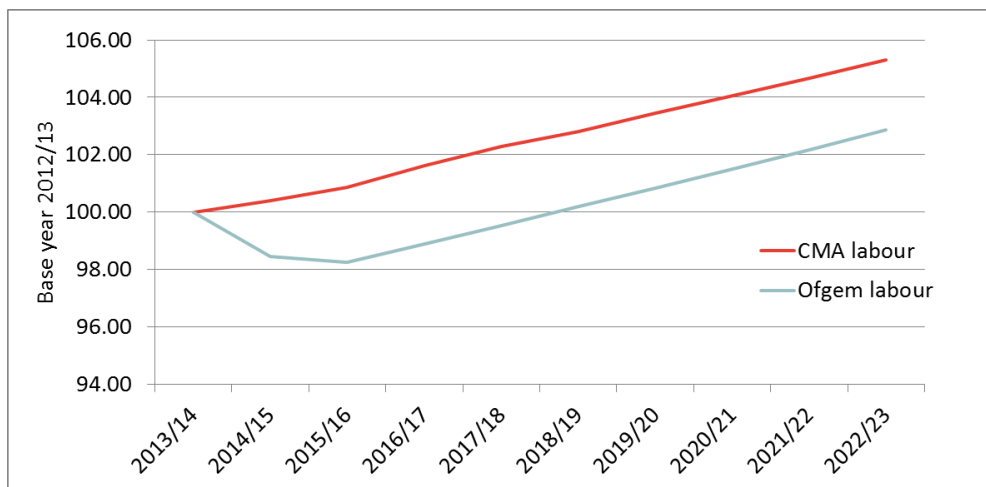


Source: Frontier Economics

- **Stage 3: Weights applied to the input indices.** Ofgem used industry average weights, whereas the CMA's approach applies each DNO's own weights to the input indices.

Given the differences in the methodologies adopted by Ofgem and the CMA, it is not possible to decompose the £175m change in RPE allowances into separate elements. However, from the analysis that we have undertaken, it is possible to identify that the choice of labour index is the key driver of our headline result. Our analysis also shows that using the DNO specific weights, as opposed to industry average weights, is beneficial but has a smaller impact.

# Additional sensitivities

We have run some additional sensitivities to test the impact of some uncertainties in relation to the data that we have used in our analysis. A short description of these sensitivities is provided below, along with a further explanation in the remainder of this section. Note that we have analysed these sensitivities separately, i.e. they are not cumulative.

- **An adaptation to the CMA's approach to estimating RPI forecasts.** In the NIE inquiry, the CMA used the OBR's forecasts to calculate RPI growth

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18    To calculate the Ofgem index for labour we inserted a weighted average of Ofgem's index for general and specialised labour into our analysis (given that the CMA only uses one index for labour as a whole). In this weighted average we used the industry average weight between general and specialised labour, across all six cost categories used by Ofgem.

on an annual basis for October of each year. If it were to apply its approach to the GB DNOs, it would be reasonable for the CMA to adapt the approach it used for NIE in relation to RPI growth. This is because the RPE allowances for GB DNOs are calculated on a financial year basis, rather than October to October.

● **Use of DNOs' wage settlements for 2014/15.** Although 2014/15 is not treated as an actual year in Ofgem's cost assessment for the draft determinations, all but one of the slow-track DNOs have already set their 2014/15 wage deals. As such, it could be argued that the average of the DNOs' 2014/15 wage settlements should be used in the analysis.

● **Use of NIE's split between general and specialised materials.** The DNOs did not submit their split between general and specialised materials in the BPDTs, as this was not required by Ofgem. As part of this work, we have collected this data from the DNOs. However, in some cases, the DNOs have informed us that the data they provided us with was based on rough approximations and assumptions. To test the importance of this split on the final result, we have calculated the RPE allowances using NIE's split between general and specialised materials. Note however, that the NIE split is not necessarily appropriate to use in the GB DNO case, as NIE's business contains both distribution and transmission elements to it.

● **Adjustment to OBR's RPI forecast.** We have been informed by Northern Powergrid that there is a potential error in the OBR's RPI forecasts. We have therefore tested the impact of this on the RPE allowances in our analysis.

### *Adaptation of CMA's approach to estimating RPI forecasts*

It appears to us that the CMA's approach to estimating RPI forecasts has been specifically designed to take account of the fact that NIE's RPE allowances were set on an October to October basis. Given that the GB DNOs' RPE allowances are set on a financial year basis, we consider that a specific element of the way that the CMA estimates its RPI forecasts could be adapted.

As described above, the CMA deducts RPI growth from nominal input price growth to estimate real input price growth. For its 'historic forecasts' the CMA uses the growth rate between the ONS' RPI for April of each year.[19] In this case, 2013/14 is the only year in which we have applied the CMA's approach for 'historic forecasts'. We calculated the 2013/14 RPI growth rate by calculating the

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[19]    As described above, in the NIE inquiry the CMA used October but it is appropriate for us to use April when applying the CMA's methodology to the GB DNOs.

rate of growth between the ONS' April 2013 RPI and the ONS' April 2014 RPI. For its 'forward-looking forecasts' the CMA projected out the RPI on a monthly basis for the duration of its forecast period, and calculates RPI growth from this projected series from October of each year.

The table below shows how the CMA did this, using the first four months of the year as an example.

**Table 9.** CMA's approach to estimating RPI growth

|  | **Jan** | **Feb** | **March** | **April** |
|---|---|---|---|---|
| **2014 RPI – ONS actual** | 252.6 | 254.2 | 254.8 | 255.7 |
| **RPI growth rate applied** | 2.9% (OBR's forecast for 2015 Q1) | 2.9 (OBR's forecast for 2015 Q1) | 2.9 (OBR's forecast for 2015 Q1) | 3.1 (OBR's forecast for 2015 Q2) |
| **2015 RPI forecast** | 259.9 | 261.6 | 262.2 | 263.6 |
| **Calculated growth rate** | 2.9 | 2.9 | 2.9 | 3.1 |

Source: Frontier Economics

For each month, the CMA takes the RPI from Year X (in our example the 2014 RPI, as published by the ONS) and applies the OBR's forecasts of annual RPI growth that are published on a quarterly basis. For example, for the first three months of the year it applies the Q1 growth rate (i.e. the growth in the RPI from Year X,Q1 to the RPI in Year X+1 Q1), and for months four to six it applies the Q2 growth rate. It performs this step to estimate RPI for Year X+1. It then calculates the forecast annual RPI growth rates for each month as the growth between its estimates of RPI in Year X+1, Month Y, and the RPI of Year X, Month Y. It calculates these RPI growth rates for each month of each year within its forecast period.

In its RPEs analysis however, it only uses the RPI growth rate that it has calculated for October of each year. Due to the set-up of its calculations, this means that it ultimately uses the OBR's forecasts for RPI growth from Q4 to Q4 of each year.

Given that the GB DNOs' RPE allowances are set on a April to April basis, a direct application of the CMA's approach (i.e. in our headline result) would result in the RPI growth rates being based on the OBR's forecasts for RPI growth from Q2 to Q2 of each year. We consider however that it would be more appropriate

to use an annual average of RPI growth (i.e. the growth from the average of RPI in Year X to the average of RPI in Year X+1). In the case of the GB DNOs, the OBR's forecasts of RPI growth on an annual average basis (financial year, i.e. April to April), could have been used. This approach would take account of the inflation that occurs throughout the whole year, rather than only one quarter. It would also mean that the RPI used in the RPE calculations would exactly align with the calculation of RPI growth that is used to uprate ex-ante revenue allowances each year (which is done on an annual average, financial year basis). We therefore consider that this adaptation would be eminently sensible.

We have tested the impact on the RPE allowances of using the OBR's RPI growth forecasts on an annual average (financial year) basis. The results of this are shown in the table below.

**Table 10.** RPE allowance for GB DNOs under the draft determination, and using CMA input indices with an adaption to the CMA's approach to estimating RPI

| Approach | Industry total RPE allowance (£m) |
|---|---|
| **Ofgem draft determination** | -77.9 |
| **CMA input indices, with adaptation to CMA's approach to estimating RPI** | 265.3 |
| **Difference to draft determination** | +343.2 |

Source: Frontier Economics

This adaptation to the methodology for forecasting RPI results in industry wide allowances of £265m, which is £168m more than our headline result. This difference is because the OBR's forecasts of RPI growth for the annual average (on a financial year basis) are lower than its forecasts of RPI growth for Q2, in the earlier years of the forecast period.

### *Use of DNOs' wage settlements for 2014/15*

The CMA used GB DNOs' wage settlements in its 'historic forecasts' of nominal wage growth. In our analysis we have therefore used an average of the DNOs' wage settlements for 2013/14 nominal wage growth, as it is treated as an actual year in Ofgem's draft determination.

Currently, all but one of the slow-tracked DNOs have set their pay deals for 2014/15. We have therefore not included 2014/15 wage settlements in our headline result. This is because our remit was to estimate what the RPE allowances would have been if Ofgem had adopted the CMA's approach at draft determinations (and at the time of draft determinations Ofgem would not have had the data on actual wage settlements for all DNOs). However, if Ofgem were

to adopt the CMAs' approach at final determinations, it would be within the spirit of the CMA's approach to use actual data for 2014/15 where it was available. If the pay deals for 2014/15 are settled for all of the DNOs by the time of final determinations, and Ofgem adopted the CMA's approach, it could be expected to use the data on 2014/15 wage settlements.

We have therefore tested the impact of using the 2014/15 wage settlements in the analysis. For this we have used the average of the slow-tracked DNOs' 2014/15 wage settlements, which is based on an expected settlement for one of the DNOs. The results of this are shown in the table below.[20]

**Table 11.** RPE allowance for GB DNOs under the draft determination, and using CMA input indices with 2014/15 wage settlements

| Approach | Industry total RPE allowance (£m) |
|---|---|
| **Ofgem draft determination** | -77.9 |
| **CMA input indices, with 2014/15 wage settlements** | 172.8 |
| **Difference to draft determination** | +250.7 |

Source: Frontier Economics

The use of the 2014/15 wage settlements results in industry wide allowances of £173m, which is £76m more than our headline result. This is because the average of the DNOs' 2014/15 wage settlements is higher than the OBR's forecast of nominal wage growth.

### *Use of NIE's split between general and specialised materials*

Ofgem did not use a separate input index for general and specialised materials. As a result, DNOs were not required to split materials into its general and specialised components in their submissions to Ofgem. As part of this work however, we have requested this split from the DNOs. We used this split to determine the weights that we applied to the CMA's input index for general and specialised materials. For example, a DNO could have stated that 20% of its load related capex was spent on materials, and that its split between general and specialised materials for load related capex is 50:50. For this DNO, we would

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[20]    Note we do not have access to WPD's 2014/15 wage settlements, so WPD is not included in this average. One of the DNOs sets pay deals on a calendar year basis, and has yet to make a settlement for 2015. We have therefore used a weighted average of its settlement for 2014 and its expected settlement for 2015.

have applied a 10% weight to the general materials index and a 10% weight to the specialised materials index for load related capex.

A number of DNOs have told us that the split they submitted to us was based on assumptions, rather than actual data. As a result, we thought it would be prudent to test the impact that the weight on general and specialised materials has in our calculations. To do this, we calculated what the RPE allowances would be if we had used NIE's split between general and specialised materials.[21] We calculated this split from NIE's actual input weights that were published in the CMA's final determination (these are shown in **Table 4**). Note that it is not necessarily appropriate to apply NIE's split to GB DNOs, as NIE operates both a distribution and transmission business. However, it allows to test the materiality of the split on the final result.

The results of this test are shown in the table below. This shows that across the industry, the split between general and specialised materials does have a material impact on the results.

**Table 12.** RPE allowance for GB DNOs under the draft determination, and using CMA input indices with NIE's split between general and specialised materials

| Approach | Industry total RPE allowance (£m) |
|---|---|
| **Ofgem draft determination** | -77.9 |
| **CMA input indices, with NIE's split between general and specialised materials** | 137.9 |
| **Difference to draft determination** | +215.8 |

Source: Frontier Economics

This shows that the RPE allowances for the industry are £138m if NIE's split between general and specialised materials is used rather than the split reported by DNOs. This is £41m more than our headline result. This is because, for most of the cost categories, NIE has a greater proportion of its materials expenditure classified as general materials than most of the DNOs, and general materials has a higher index than specialised materials.

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[21]   The NIE data allows us to calculate a split for both materials capex and opex. For each cost category in Ofgem's analysis, the DNOs submitted the proportion of spend in that category on materials capex and materials opex separately. This allowed us to apply the NIE materials capex split between general and specialised materials to the DNOs' submitted weight for materials capex, and the NIE materials opex split to the DNOs' submitted weight for materials opex. We used the same split for each cost category.

## *Adjustment to OBR's RPI forecast*

We ran a sensitivity in relation to the OBR's RPI forecast because Northern Powergrid informed us that there was a potential error in the way that the OBR has forecast the RPI.

The OBR's RPI forecast is made up of:

- its CPI forecast (which over the medium-long term is the Bank of England's 2.0% target rate); and

- its estimate of the RPI-CPI wedge (which ranges from 0.8-1.9 percentage points over the period 2014/15 to 2018/19).

There are a number of differences between the RPI and the CPI, which must be accounted for when estimating the RPI-CPI wedge. The ONS measures the historical RPI-CPI wedge and decomposes it into a number of separate elements. In estimating the size of the RPI-CPI wedge over the long-term, the OBR also decomposes the wedge into a number of elements.

The table below shows the separate elements of both the ONS' and OBR's decomposition of the RPI-CPI wedge.

**Table 13.** Decomposition of the RPI-CPI wedge

| OBR/ONS approach | Element | Description | ONS ('05-Oct '11) | OBR[22] |
|---|---|---|---|---|
| **Common elements to ONS and OBR** | **Housing** | The RPI includes housing components such as housing depreciation, council tax and rates, and mortgage interest rate payments. | 0.3 | 0.5 |
| | **Coverage** | The CPI includes a number of components that are not included in the RPI such as brokerage fees, and student accommodation fees. | -0.1 | 0 |
| | **'Formula effect'** | The RPI uses the Carli formula, which only uses the arithmetic mean of the basket of goods, whereas the CPI uses the Jevons formula which uses a combination of a geometric mean and arithmetic mean. | 0.6 | 0.9 |
| **Only ONS** | **Other difference inc. weights** | The ONS sets this as a residual term, i.e. it subtracts the elements above from the overall difference between the RPI and the CPI and sets this as its final term in its decomposition. | -0.3 | 0 |
| **Only OBR** | **Difference in weights** | The weights given to the components of the basket differ. | N/A | 0 |

Source: http://budgetresponsibility.org.uk/wordpress/docs/Working-paper-No2-The-long-run-difference-between-RPI-and-CPI-inflation.pdf

In its decomposition of the RPI-CPI wedge, the OBR has broadly followed the ONS' approach. The only difference between the components of the ONS' decomposition and the OBR's decomposition is that the ONS has a term called 'other differences including weights' and the OBR has a term called 'differences in weights'.

The ONS calculates 'other differences including weights' as a residual term, which it is able to do given that it is working with historical data.[23] This term is calculated as the difference between the RPI and the CPI minus the sum of the

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[22]    This is the mid-point of the OBR's forecast for the long-term published in a working paper. This is not the RPI-CPI wedge that is used to estimate its RPI forecasts.

[23]    http://www.ons.gov.uk/ons/guide-method/user-guidance/prices/cpi-and-rpi/consumer-price-index-and-retail-price-index---analysing-differences.pdf

first three terms of the ONS' decomposition (i.e. housing, coverage, and the 'formula effect'). As it is a residual term, it incorporates the impact of the difference in weights between the RPI and the CPI, and any other differences. For example, included in this difference is any interaction between the weights used and the 'formula effect'. We would expect the impact of this interaction to be non-zero.[24]

It is not possible for the OBR to include a residual term, like the ONS does, because the OBR is working with forecasts rather than historical data (i.e. the OBR uses its estimate of the RPI-CPI wedge to forecast RPI, rather than using the outturn CPI and RPI to calculate the RPI-CPI wedge). However, in estimating the 'difference in weights' only, it is possible that the OBR has not included some elements of the RPI-CPI wedge in its forecast.

To test the impact of this potential error in the OBR's methodology, we have looked at the size of the difference between the ONS' 'other differences including weights' and the OBR's 'differences in weights'. In a working paper, the OBR has estimated that its 'differences in weights' term is zero over the longer-term. The OBR states that the average of the ONS' 'other differences including weights' from 2005 until October 2011 is -0.3 percentage points. We therefore consider that an appropriate sensitivity test would be to reduce the OBR's RPI-CPI wedge by -0.3 percentage points, which would imply (all other things being equal) a -0.3 percentage points reduction in the OBR's RPI forecasts. [25]

The results of this are shown in the table below.

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[24]   The nature of the 'formula effect' is such that not all goods within the basket are affected by the use of different formulas by the same amount. For example, clothing is heavily affected by which formula is used to calculate the index. Given that clothing (and other goods which are affected by the 'formula effect') has a different weight in the RPI and the CPI, the measurement of the 'formula effect' would differ in size depending on which weights were used. The standard measurement of the 'formula effect' uses the CPI weights (i.e. it is calculated by comparing the CPI using the Jevons formula, with the CPI using the Carli formula). However, the decomposition should also include a term which takes account of the fact that the RPI uses different weights to the CPI, and that this difference in weights interacts with the difference in formula. The ONS' residual term effectively incorporates this interaction, although this isn't necessarily clear from the names given to the elements of the decomposition.

[25]   It is not necessary to make a similar adjustment to the forecasts of nominal inflation for the inputs, as these forecasts are not directly linked to the RPI forecast (and therefore do not contain the same potential error). This is true for labour inflation, even though it is also forecast by the OBR, as the OBR's labour inflation forecasts are not directly linked to its forecasts of RPI (they are determined by a forecast of inflation more generally).

**Table 14.** RPE allowance for GB DNOs under the draft determination, and using CMA input indices with an adjustment to the OBR's RPI forecasts

| Approach | Industry total RPE allowance (£m) |
|---|:---:|
| **Ofgem draft determination** | -77.9 |
| **CMA input indices, with adaptation to CMA's approach to estimating RPI** | 369.0 |
| **Difference to draft determination** | +446.9 |

Source: Frontier Economics

Given that real input price growth, which determines the input indices, is calculated from nominal input price growth and the RPI, reducing the RPI forecasts increases the real input price growth. Reducing the RPI forecasts substantially increases the RPE allowances that are calculated, in comparison to the baseline case. The industry wide RPE allowance is £369m, £272m higher than our headline result.

It is not clear whether such an adjustment would be considered valid by Ofgem. We would consider that the ONS and/or the OBR would need to clarify that this is a genuine issue with the OBR RPI forecast. If the DNOs wished to pursue this avenue therefore, they would need to convince both the OBR (and possibly also the ONS), and Ofgem that it had merit. In practice, it seems unlikely that this would happen before the end of the price control review.

# Conclusion

Our application of the CMA's input indices and methodology from the NIE inquiry to the GB DNOs results in substantially more generous RPE allowances than the ones set by Ofgem in its draft determination. The industry wide allowances would have been £175m higher if Ofgem had adopted the CMA's input indices and methodology.

Due to the differences in the two methodologies, it is not possible to decompose this change in RPE allowances into separate elements. However, we do know that the choice of labour index is the key driver of our headline result.

We identified that there were some potential issues in the data that we used in our analysis. To test the impact of these, we ran three analysis sensitivities. If it was confirmed that there are issues with the data, and some adjustments or adaptations were required to resolve these issues, our analysis has shown that these adjustments would result in higher RPE allowances.

Our analysis should not be used to draw any conclusions about what RPE allowances GB DNOs would get if their price control was referred to the CMA. This is because the CMA may not use the approach is used in the NIE inquiry in a referral from a GB DNO. For example, the CMA may not be inclined to rely on the OBR forecasts in a referral case from a GB DNO. While the OBR forecasts covered the entire forecast period in the NIE inquiry, the current publications from the OBR do not include forecasts that cover the whole RIIO-ED1 period. Similarly, it is possible that the CMA's methodology would be influenced by Ofgem's: in the NIE inquiry the CMA stated that it had used Ofgem precedent at the time (i.e. from DPCR5) to determine its input categories.

# Annex

This annex presents the results of our analysis by DNO.

**Table 15** shows the RPE allowances under our headline result, i.e. using the CMA's approach, for each DNO.

**Table 15.** RPE allowances for GB DNOs under the draft determination and using CMA input indices

| DNO | Using CMA input indices, DNO specific weights (£m) | Ofgem draft allowances (£m) | Difference (£m) |
|---|---|---|---|
| **ENWL** | 1.0 | -7.7 | 8.7 |
| **NPGN** | 12.2 | -5.9 | 18.1 |
| **NPGY** | 15.9 | -8.0 | 23.9 |
| **LPN** | 20.7 | -7.8 | 28.5 |
| **SPN** | 22.3 | -7.6 | 29.9 |
| **EPN** | 33.3 | -11.1 | 44.4 |
| **SPD** | 0.4 | -6.9 | 7.3 |
| **SPMW** | 1.6 | -8.2 | 9.8 |
| **SSEH** | -4.3 | -4.4 | 0.0 |
| **SSES** | -5.9 | -10.4 | 4.5 |
| **Industry total** | 97.2 | -77.9 | 175.1 |

Source: Frontier Economics

CMA RPEs methodology in the NIE inquiry                    Draft

**Table 16** shows the RPE allowances that are calculated using the CMA's input indices and industry average weights, for each DNO.

**Table 16.** RPE allowances for GB DNOs under the draft determination and using CMA input indices, with industry average weights

| DNO | Using CMA input indices, industry average weights (£m) | Ofgem draft allowances (£m) | Difference (£m) |
|---|---|---|---|
| ENWL | 9.2 | -7.74 | 17.0 |
| NPGN | 6.5 | -5.92 | 12.4 |
| NPGY | 8.7 | -7.95 | 16.7 |
| LPN | 7.4 | -7.76 | 15.1 |
| SPN | 8.5 | -7.63 | 16.1 |
| EPN | 12.7 | -11.05 | 23.7 |
| SPD | 7.9 | -6.90 | 14.8 |
| SPMW | 7.3 | -8.17 | 15.5 |
| SSEH | 6.5 | -4.38 | 10.9 |
| SSES | 12.3 | -10.40 | 22.7 |
| **Industry total** | 87.1 | -77.90 | 165.0 |

Source: Frontier Economics

**Table 17** shows the results of our fist sensitivity test – calculating the RPE allowances using the CMA's input indices and adapting the CMA's approach to estimating RPI – for each DNO.

**Table 17.** RPE allowances calculated with adaptation to the CMA's RPI estimation

| DNO | Using CMA input indices, DNO specific weights (£m) | Using CMA input indices – adaptation to CMA RPI approach (£m) | Ofgem draft allowances (£m) |
|---|---|---|---|
| ENWL | 1.0 | 18.9 | -7.74 |
| NPGN | 12.2 | 24.2 | -5.92 |
| NPGY | 15.9 | 32.4 | -7.95 |
| LPN | 20.7 | 37.1 | -7.76 |
| SPN | 22.3 | 38.8 | -7.63 |
| EPN | 33.3 | 58.1 | -11.05 |
| SPD | 0.4 | 15.2 | -6.90 |
| SPMW | 1.6 | 17.3 | -8.17 |
| SSEH | -4.3 | 6.5 | -4.38 |
| SSES | -5.9 | 16.7 | -10.40 |
| Industry total | 97.2 | 265.3 | -77.90 |

Source: Frontier Economics

**Table 18** shows the results of our second sensitivity test – calculating the RPE allowances using the CMA's input indices, and using 2014/15 wage settlements – for each DNO.

**Table 18.** RPE allowances with 2014/15 wage settlements

| DNO | Using CMA input indices, DNO specific weights (£m) | Using CMA input indices – 2014/15 wage settlements (£m) | Ofgem draft allowances (£m) |
|---|---|---|---|
| ENWL | 1.0 | 8.2 | -7.7 |
| NPGN | 12.2 | 18.1 | -5.9 |
| NPGY | 15.9 | 23.9 | -7.9 |
| LPN | 20.7 | 28.8 | -7.8 |
| SPN | 22.3 | 30.5 | -7.6 |
| EPN | 33.3 | 45.6 | -11.0 |
| SPD | 0.4 | 6.8 | -6.9 |
| SPMW | 1.6 | 8.5 | -8.2 |
| SSEH | -4.3 | -0.6 | -4.4 |
| SSES | -5.9 | 2.8 | -10.4 |
| Industry total | 97.2 | 172.8 | -77.9 |

Source: Frontier Economics

**Table 19** shows the results of our third sensitivity test – calculating the RPE allowances using the CMA's input indices and using NIE's split between general and specialised materials – for each DNO.

**Table 19.** RPE allowances calculated using NIE materials split

| DNO | Using CMA input indices, DNO specific weights (£m) | Using CMA input indices – NIE split (£m) | Ofgem draft allowances (£m) |
|---|---|---|---|
| ENWL | 1.0 | 4.0 | -7.74 |
| NPGN | 12.2 | 13.6 | -5.92 |
| NPGY | 15.9 | 17.6 | -7.95 |
| LPN | 20.7 | 23.3 | -7.76 |
| SPN | 22.3 | 25.3 | -7.63 |
| EPN | 33.3 | 37.8 | -11.05 |
| SPD | 0.4 | 9.8 | -6.90 |
| SPMW | 1.6 | 10.6 | -8.17 |
| SSEH | -4.3 | -4.8 | -4.38 |
| SSES | -5.9 | 0.8 | -10.40 |
| **Industry total** | 97.2 | 137.9 | -77.90 |

Source: Frontier Economics

**Table 20** shows the results of our fourth sensitivity test – calculating the RPE allowances using the CMA's input indices, with an adjustment to the OBR's RPI forecasts – for each DNO.

**Table 20.** RPE allowances with RPI adjustment

| DNO | Using CMA input indices, DNO specific weights (£m) | Using CMA input indices – RPI adjustment (£m) | Ofgem draft allowances (£m) |
|---|---|---|---|
| ENWL | 1.0 | 30.0 | -7.74 |
| NPGN | 12.2 | 31.5 | -5.92 |
| NPGY | 15.9 | 42.4 | -7.95 |
| LPN | 20.7 | 47.2 | -7.76 |
| SPN | 22.3 | 49.0 | -7.63 |
| EPN | 33.3 | 73.6 | -11.05 |
| SPD | 0.4 | 24.3 | -6.90 |
| SPMW | 1.6 | 26.9 | -8.17 |
| SSEH | -4.3 | 13.3 | -4.38 |
| SSES | -5.9 | 30.7 | -10.40 |
| **Industry total** | 97.2 | 369.0 | -77.90 |

Source: Frontier Economics

CMA RPEs methodology in the NIE inquiry                     Draft