Real Price Effects, 2013/14 to 2022/23

Prepared for WPD

FIRST ECONOMICS

www.first-economics.com

14 January 2013

1. Introduction

This paper contains First Economics' estimates of the real price effects (RPEs) that are likely to confront an efficient electricity DNO over the period 2013/14 to 2022/23. It is intended to be a contribution to the business plan that WPD is preparing as part of Ofgem's RIIO-ED1 review.

The paper is structured into two main parts:

- section 2 gives an update on our approach to this work, focusing especially on our reasons for deviating from the methodology that Ofgem used in its December 2012 RIIO-GD1 and RIIO-T1 final proposals; and
- sections 3 to 6 contain the input-by-input nominal inflation projections and our calculation of RPEs.

2. Methodology

This report has been prepared at roughly the same time as Ofgem's final analysis of RPEs for National Grid's electricity transmission business and the GB gas transmission and gas distribution networks. It is therefore an opportune moment to compare our approach to Ofgem's approach and to explain the differences in the methodologies.

There are four key points to highlight.

Real vs nominal input price forecasts

This report, like all of First Economics' previous reports, produces each RPE forecast via a two-step calculation in which we first estimate the expected rate of nominal input inflation and then subtract the expected rate of RPI-measured inflation. Ofgem, by contrast, prefers to focus from the outset on real price trends and makes forecasts of RPEs independently of the expected rate of RPI-measured inflation in any given year.

We have explained in previous reports why our approach is to be preferred to Ofgem's method. A very important consideration for us in preparing this latest analysis has been that RPI has not been especially well-behaved in recent times and is not expected to give 'normal' readings for the foreseeable future. This is partly a short-term consequence of the effects of recession, but it also reflects two factors that will cause CPI inflation and RPI inflation to drift apart over the forecast period:

- first, the 'formula effect' difference between RPI- and CPI-measured inflation has widened recently as a result of technical changes that the ONS has made to the way that it collects and averages price data for certain items in the inflation basket. This means that the government's 2% CPI inflation target probably now translates to RPI inflation of around 3.4% per annum, where previously most forecasters would have used a figure of around 2.8%; and
- second, there is an expectation that RPI inflation will move up at some point during the next five years when the Bank of England takes interest rates back up from their current historical lows. Because mortgage interest rates are not included in CPI, this will not affect readings of CPI inflation.

Given these unusual influences on RPI, it is not realistic to think that RPEs that are measured against RPI inflation will revert to some sort of pre-recession trend. If this were to be the case – i.e. if wages, material and equipment prices were to follow RPI inflation up in the next few years – the economy would fall into an inflation spiral. This is an implausible scenario at a time when there is an explicit government CPI inflation target.

It is much more tenable to suggest that nominal input price increases will revert to trend, with measured RPEs having no significance in their own right other than as the mathematical consequence of the contemporaneous path that RPI-measured inflation takes over the forecast period. In our way of looking at things, RPI is best thought of as an exogenous benchmark which is used for regulatory purposes to rebase nominal input price inflation forecasts rather than a driver of nominal input price inflation itself.

For these reasons, we are clear that we should stick with our two-step approach.

Office for Budget Responsibility forecasts vs consensus forecasts

We have previously anchored our forecasts as closely as possible to the most recent Office of Budget Responsibility (OBR) economic forecasts. Ofgem in its RIIO final proposals explicitly rejects this approach and prefers instead to refer to the latest HM Treasury round-up of independent economic forecasts.

The principal reason that Ofgem gave for this stance was the better reliability it thought it would obtain through crowd-sourcing economic forecasts rather than relying on a single forecaster. Ofgem also faced a practical issue when preparing its RIIO final proposals in that the most recent OBR forecast at the time of publication was from March 2012 and felt increasingly out-of-date, whereas the most recent HM Treasury round-up was published in November 2012.

We do not think that the benefit from the first of these things should be over-stated. Although more data is usually to be preferred to less data, in this case the single forecast on which we rely comes from a very authoritative source. The OBR, unlike private forecasters, has more up-to-date visibility of economic data and government fiscal policy and is explicitly tasked with taking a coherent overall look at the UK economy's prospects. This informational advantage ought to be taken into consideration and given considerable weight.

On the second point, the OBR December 2012 forecast gives a very up-to-date anchor for these January 2013 estimates. The OBR also provides a richer data set – for example, financial year data and average earnings forecasts going out to 2017/18, as compared to calendar year data and forecasts for wages only up to 2013 in the case of the HM Treasury round-up. This makes the OBR forecast the practically more useful data at the time of writing.

For these reasons, we do not see how Ofgem could justify rejecting forecasts of input prices or RPI-measured inflation as not being 'well justified' if they are taken from the OBR. Accordingly, our GDP, RPI and wage forecasts through to 2017/18 are taken directly from the OBR's December 2012 spreadsheets.

Extrapolation

All studies of this type extrapolate to some extent from historical data, especially when making input price inflation forecasts for the later years in the forecast period. We prefer to use data from the years leading up to the 2008 recession as the best available guide to likely input price pressures at a time of normal GDP growth. Ofgem in its proposals has stated it prefers to use historical averages over a 20-year period up to 2009/10.

This is troubling for two reasons:

- 2008/09 and 2009/10 saw shrinking GDP growth. It is not obvious why data from these two years would be an indicator of input price inflation during a period of healthy economic growth; and
- the drivers of wage and material price increases during the 1990s were very different from the drivers of inflation going forward. On the labour side, there wasn't the mismatch that exists today between the supply and demand of skilled infrastructure specialists, principally because there wasn't anything like the level of infrastructure investment that there is now. On the materials side, global GDP growth was between 2% and 3% per annum throughout the 1990s as compared to 4% to 5% per annum going forward. As a consequence, there wasn't the same pressures on commodity prices or the same cost-push inflation that companies have been having to deal with over the next last 8-10 years and can reasonably expect to have to continue grappling with over the next decade.

We not think that it is tenable to stick rigidly to a policy of extrapolating from price trends over a 20-year horizon if this means ignoring fundamental changes in market conditions during that time. It is much better to be flexible about the period of time that one goes to to collect historical data, informed by as full an understanding as possible of what has driven past price changes and the likelihood of seeing similar cost drivers in the future.

Choice of indices

At a very detailed level, there are differences in the indices that we have examined in our previous reports and the indices that Ofgem references in its RIIO final proposals.

The most notable difference is in the analysis of plant and equipment, where Ofgem adds two ONS PPI machinery and equipment indices to the BCIS plant and road vehicles index that we have used in our work. We think this might reflect a misunderstanding on Ofgem's part as to what 'plant and equipment' means. The costs that are of interest here relate to the heavy plant and road vehicles that DNOs use when installing apparatus onto their networks. It does not relate to the cost of that apparatus, which is picked up elsewhere under materials inputs. Insofar as the PPI machinery and equipment indices comprise the prices of things like transformers, control apparatus, wires and cables, and other electrical equipment, there is a clear double count in Ofgem's RIIO-T1/RIIO-GD1 work.

The other differences in our choices of indices are less fundamental. We can nevertheless observe that:

- wages – the electricity, gas and water sector average weekly earnings index is likely to give more accurate insights into DNO wage inflation than the construction sector or transport/storage sector average weekly earnings indices; and
- materials – Ofgem should not really be including the costs of intermediate goods like basic metals in the calculation of materials inflation. As Ofgem itself notes in the RIIO final proposals, it is the cost of final output that is of interest rather than the cost of raw inputs.

Summary

For the reasons set out above we have not changed our approach to calculating RPEs since we last produced forecasts for WPD in June 2012. We have, however, updated the forecasts for the latest economic developments, as set out below.

3. GDP Growth

3.1 Latest evidence

Our detailed January 2013 forecasts start with a brief summary of the current economic outlook.

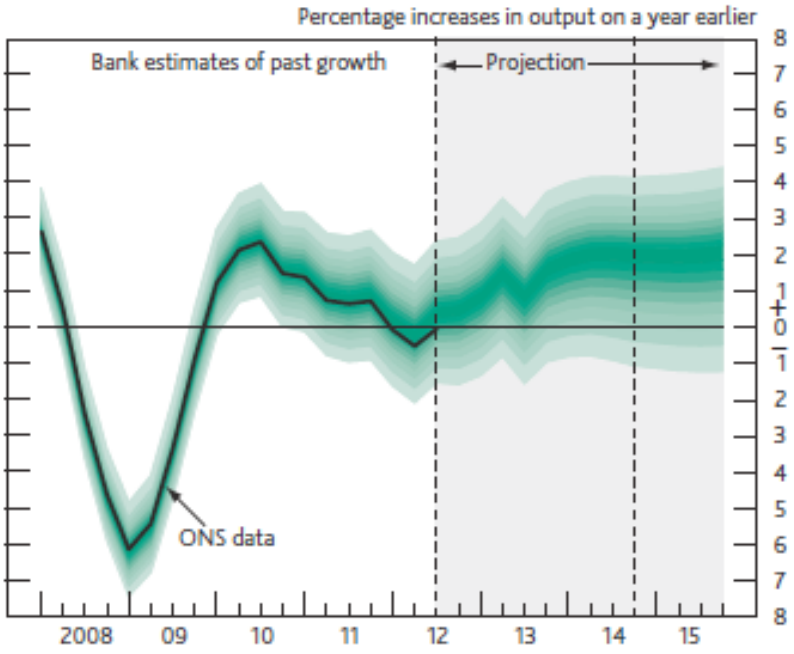
Table 3.1 and figure 3.2 reproduce figures that may be found in the OBR's December 2012 economic forecasts and the Bank of England's November 2012 Inflation Report.

Table 3.1: OBR's December 2012 forecasts of GDP growth

	Percentage change on a year earlier, unless otherwise stated						
	Outturn	Forecast					
	2011	2012	2013	2014	2015	2016	2017
UK economy							
Gross domestic product (GDP)	0.9	- 0.1	1.2	2.0	2.3	2.7	2.8
GDP Level (2011=100)	100.0	99.9	101.1	103.2	105.6	108.4	111.4
Nominal GDP	3.6	2.2	3.3	4.1	4.4	4.7	4.9
Output Gap (per cent of potential output)	- 2.7	- 3.1	- 3.5	- 3.3	- 3.0	- 2.5	- 1.9
World economy							
World GDP at purchasing power parity	3.9	3.2	3.5	4.2	4.5	4.6	4.7
Euro Area GDP	1.5	-0.4	0.0	1.1	1.4	1.7	1.9
World trade in goods and services	5.8	3.0	4.4	5.9	6.3	6.5	6.6
UK export markets[5]	6.0	2.7	4.3	5.5	5.8	6.0	6.1

Source: OBR.

Figure 3.2: The Bank of England's November 2012 forecasts of GDP growth



Source: Bank of England.

The two sets of numbers tell a fairly consistent story about the path which the UK economy is set to follow, albeit with the Bank of England painting a slightly more pessimistic picture than the OBR. In both cases, there is a year of disappointing growth during 2013 as households continue to grapple with shrinking real incomes, exporters struggle with sluggish external demand and the

government reins back its spending. Thereafter the recovery gathers pace through 2014 and starts to exhibit growth of 2% to 3% per annum from late 2013 onwards.

The Bank of England helpfully identifies the key uncertainties around the central case. The main downside risk is around the challenges within the eurozone, but there are also continued concerns about the erosion of household incomes by inflation. Balanced against this on the upside, the Bank is positive about the growth of credit and notes that either a slowdown in inflation or increased productivity growth would help boost wages and support household consumption. It is also possible that fears about the eurozone economies have been exaggerated. Figure 3.2 shows a balanced set of risks around the central case, with the downside probabilities no greater than the upside probabilities in the Bank's estimation.

As far as the global economy is concerned, the figures in table 3.1 show a small dip in world GDP growth in 2012 and 2013 as the effects of the eurozone recession and weak growth in the US affect export-oriented economies around the world. However, the scale of this slowdown is not to be overstated and there is a return to very strong global growth from 2014 onwards.

Looked at side-by-side, the implication of these forecasts is that inflationary pressures will be weak generally for the next 12-18 months before strong global growth and the much-delayed recovery of the UK economy put new pressures on prices. We now consider to what extent this is apparent in recent data and what the prognosis is for the 2013/14 to 2022/23 period.

4. Input price inflation

4.1 Wages – general

Our analysis of wage increases for the majority of people that regulated networks employ is based on the ONS index for private sector wages including and excluding bonuses.

Figure 4.1: Private sector wage inflation

Source: ONS.

The chart shows a marked shift in wage pressures due to recession. After growing at an average annual rate of just over 4% between 2000 and 2008, wages declined in absolute terms in 2009, after accounting for the effects of withdrawn bonuses, and have grown by only around 2.0% per annum since. The latest monthly data from Q3 2012 shows still very weak wage pressures, with annual private-sector wage growth at 1.9% on both of the above measures.

Going forward the expectation is one of subdued wage growth for at least another 2 years. This is based to a large extent on historical experience which shows that pay increases typically lag behind the growth in GDP by several quarters, mainly because recession creates a pool of unemployed workers who compete vigorously for jobs once economic activity picks up and firms resume hiring. Although this recession resulted in fewer redundancies than previous recessions, there are still as many as 1m more individuals than normal in unemployment and many more who have been forced onto part-time hours or into jobs that they might not otherwise have taken. This should mean that employers, including the electricity DNOs when they are looking to fill roles that do not have sector-specific features, will for a period find that they do not need to offer significant pay increases in order to attract and retain good staff.

The OBR's December 2012 report gives a sense of what sort of increases firms should expect to have to pay during the next five years.

Table 4.2: OBR December 2012 Labour market forecasts

	Percentage change on a year earlier, unless otherwise stated						
	Outturn	Forecast					
	2011	2012	2013	2014	2015	2016	2017
Labour market							
Employment (millions)	29.2	29.5	29.6	29.7	29.9	30.2	30.4
Wages and salaries	2.5	3.3	2.7	3.2	4.5	4.8	4.9
Average earnings[4]	2.2	2.7	2.2	2.8	3.7	4.0	4.0
ILO unemployment (% rate)	8.1	8.0	8.2	8.2	8.0	7.6	7.1
Claimant count (millions)	1.53	1.59	1.66	1.69	1.63	1.53	1.43

Source: OBR.

The projections have average earnings growth accelerating from around 2% currently to 4.0% by the end of the forecast period. We use the financial year equivalents as the best available estimates of the wage inflation for general workers employed by an electricity DNO in the period to 2017/18, as set out in table 4.3 below. From 2018/19 onwards we think it is prudent for DNOs to allow for pay increases in line with the pre-recession growth of average weekly earnings including bonuses of 4.25% per annum.

Table 4.3: General wage inflation

	Average earnings growth
2013/14	2.2%
2014/15	3.0%
2015/16	3.9%
2016/17	4.0%
2017/18	3.9%
2018/19 and thereafter	4.25%

4.2 Wages – specialist

In previous reports we have argued that certain types of worker – most notably electrical engineers and labour with specialist infrastructure skills like civil engineers, project managers and surveyors – will be able to extract above-average wage increases. Our contention has been that the coincidence of the ramp up in expenditure and investment that is occurring simultaneously in the different infrastructure industries, the exacerbatory impact of major projects like the Crossrail, and the continued existence of skills shortage in a number of the skilled professions, create a mismatch in supply and demand that gives significant bargaining power to the specialist labour that the networks require. Our June 2012 report assumed that this bargaining power would translate in to a premium of up to 1.25% per annum.

Data published during the last 4 years confirms the story that we told. Table 4.4 compares increases in indices tracking skilled infrastructure workers' wage increases with average earnings growth between 2007 and 2011. It shows that clearly that specialist wages have grown much more than average during and after the recession.

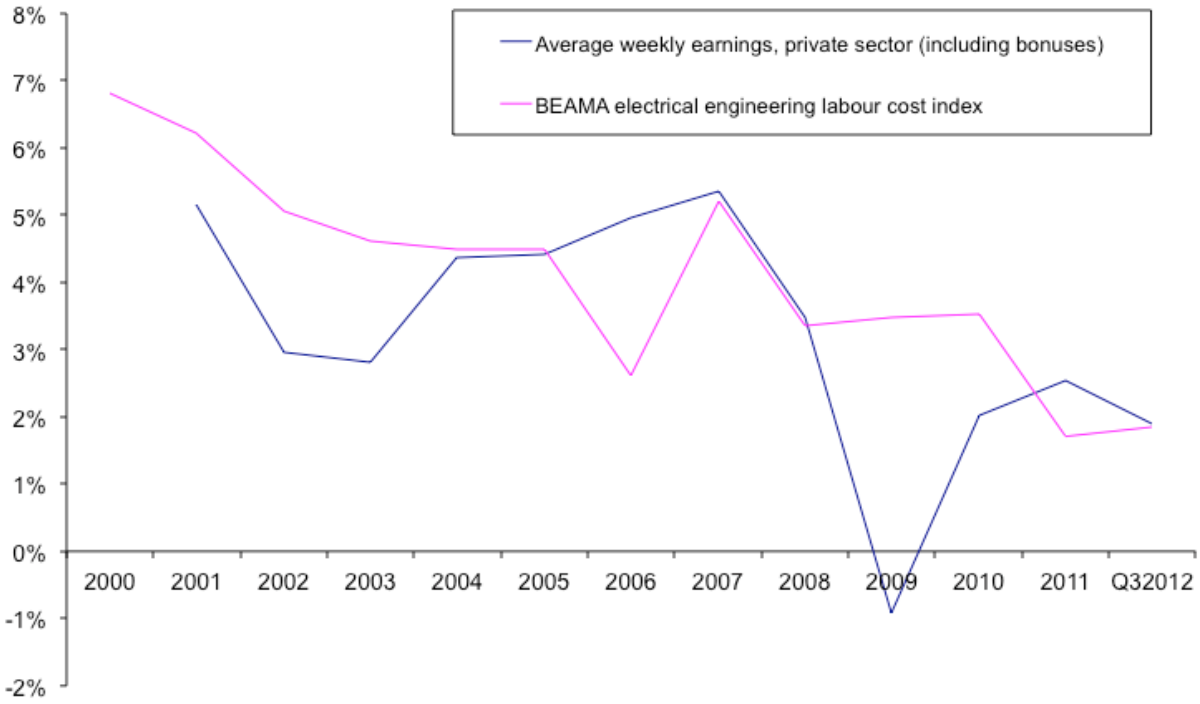
Table 4.4: Wage increases, 2011 vs 2007

Index	Growth
ONS: electricity, gas and water sector, incl. bonuses	9.3%
BEAMA: electrical engineering	12.6%
BEAMA: mechanical engineering	17.3%
BCIS: electrical labour	14.8%
ONS: private-sector average earnings growth, incl. bonus	7.2%
ONS: private-sector average earnings growth, excl. bonus	8.6%

Source: ONS, BEAMA, BCIS.

There has, however, been a noticeable slowdown in specialist wage inflation during the last 12-18 months on all four of the skills-specific measures identified above. As evidence of this, Figure 4.5 compares the BEAMA electrical engineering series and average weekly earnings index.

Figure 4.5: Wage inflation among electrical engineers



Source: ONS, BEAMA.

This is not sufficient to cause us to alter our assessment of the differential between average and specialist wage inflation. Going forward, demand for specialist skills is certain to remain high. We note, in particular, that step increases in transmission capex, increased DNO capex, continued high levels of investment in the water sector, a ramp up in Network Rail's expenditure, and a steady stream of other infrastructure projects will create considerable competition for the specialist skills that the electricity DNOs need. As a consequence, wage inflation for specialist labour is almost certain to go on outstripping average earnings growth.

Our reading of table 4.4 and figure 4.5 is that it remains prudent to add 1.25% to the base trend in average earnings for the specialist workers in the DNO input mix. This gives inflation expectations for this type of labour set out in the table below.

Table 4.6: Wage inflation for workers with specialist skills

	Specialist wage growth
2013/14	3.45%
2014/15	4.25%
2015/16	5.15%
2016/17	5.25%
2017/18	5.15%
2018/19 and thereafter	5.5%

4.3 Materials

Materials have tended to be the hardest of all the items in the DNO input mix to forecast. Up until around ten years ago materials costs were typically flat or falling over time, just like the prices of most other physical goods. This picture then changed with the emergence of China and other

developing economies as major consumers of raw commodities. Recession temporarily reined back most prices, but in the last 2-3 years companies have once again had to deal with significant price increases.

We consider the situation currently confronting the DNOs by looking at different material types in turn.

Materials – general/civils

Figure 4.7 plots the BIS cost of infrastructure materials and cost of construction (non-housing) materials series over the period since 2000.

Table 4.7: Materials costs

Source: BCIS.

The chart shows that 2009 was the only year since 2002 in which the two indices did not register inflation of more than 4%. Price increases in 2010 and 2011 then exceeded 6%.

We recognise that there is a legitimate view that the price increases that companies have faced since 2005 cannot carry on forever. But at the same time, we do not think it is tenable to argue that price pressures will disappear. Ofgem in its GDPCR calculations and First Economics in our DPCR5 work both previously assumed that the rate of increase of general materials costs in steady state is 4.5% and we continue to take the view that this is a reasonable medium-term benchmark to factor into forward-looking RPE calculations. In this forecast, we allow for a small slowdown in cost increases in the short term to be consistent with the weakening of global growth over the next year or so

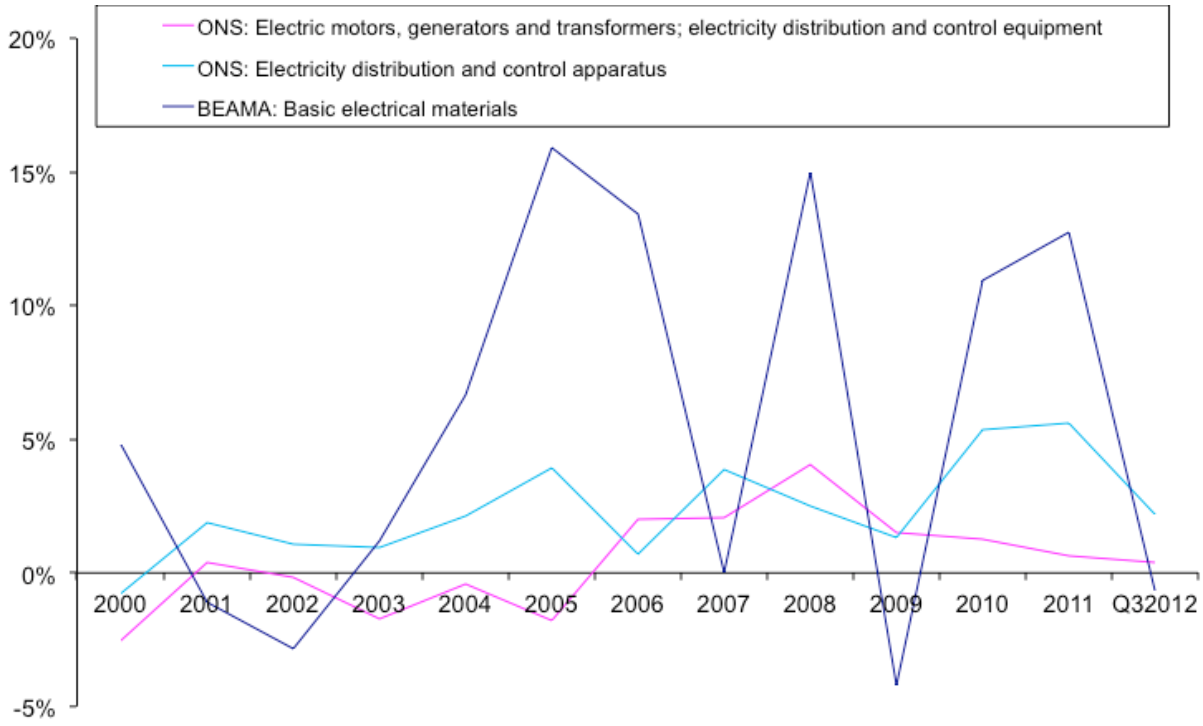
Table 4.8: Forecasts of general materials inflation

	Materials cost increases
2013/14	3.5%
2014/15 and thereafter	4.5%

Materials – electrical

The BEAMA electrical materials index gives a more precise reading of the inflation affecting the specialist electrical equipment than the DNOs are installing on their networks. Figure 4.9 plots the change in the value of the index over the last ten years alongside movements in two series from the ONS's producer price indices.

Figure 4.9: Electrical material cost increases



Sources: BEAMA; ONS.

As in the previous chart, the data shows buyers having to deal with significant price increases in 2010 and 2011 after a temporary cooling of inflationary pressures during the crisis of 2009. During 2012 prices have been subdued due to the slowdown in global GDP growth.

In forecasting what will happen to these indices in the coming months and years, one has to take account first and foremost of likely commodity price movements. Here the story for the foreseeable future remains one of growing demand from China and other developing countries putting pressure on the supply of metals and driving prices up. Insofar as the outlook for global economic growth is one of slightly slower growth in 2012 and 2013 followed by strong expansion from 2014 onwards (as shown in the OBR forecasts in table 3.1 above), the likeliest or central scenario has to be one in which price increases ease in the short term but then revert back towards the trend rates of growth that has been observed in our selected indices since around 2003.

The historical growth of the main BEAMA index over the period 2003 to 2011 would, in isolation, justify a forecast of at least 8% per annum. However, recognising that the ONS indices show a lower rate of price increases, we consider it is prudent for the DNOs to factor equilibrium price increases of 5% per annum over the forecast period.

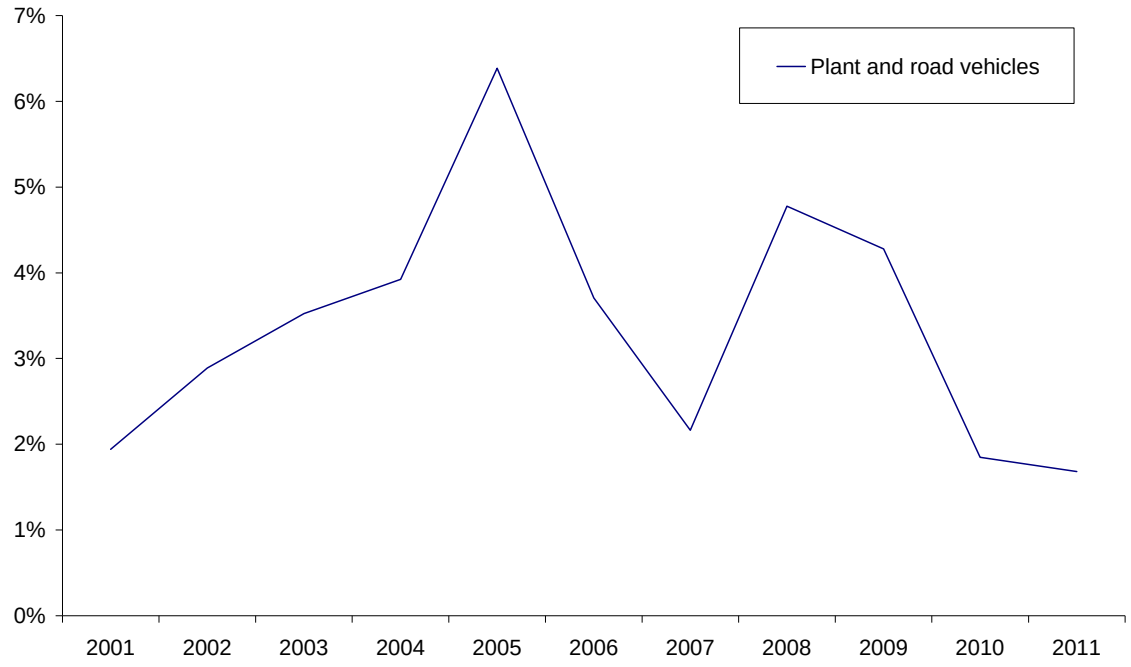
Table 4.10: Specialist electrical materials cost inflation

	Specialist electrical materials cost increases
2013/14	3%
2014/15 and thereafter	5%

4.4 Plant and equipment

The best indicator of the cost pressures impacting on the plant and equipment that the DNOs use to repair and extend their networks is the BCIS plant and road vehicles index. Figure 4.11 plots the annual change in this index in recent years.

Figure 4.11: Plant and equipment cost increases



Source: BCIS.

The chart shows more of a discernible slowing of price pressures since 2010. This probably reflects redundancy in the construction sector generally, which has been of benefit to all purchasers/leasers of plant and equipment that is used for the purposes of transporting and installing materials.

On the basis of this recent experience, we have suggested in previous reports that it is prudent to allow for comparable price increases of 4% per annum in the medium term. The most recent evidence does nothing to alter our views on this matter. As elsewhere, we provide for a glidepath back to this run rate.

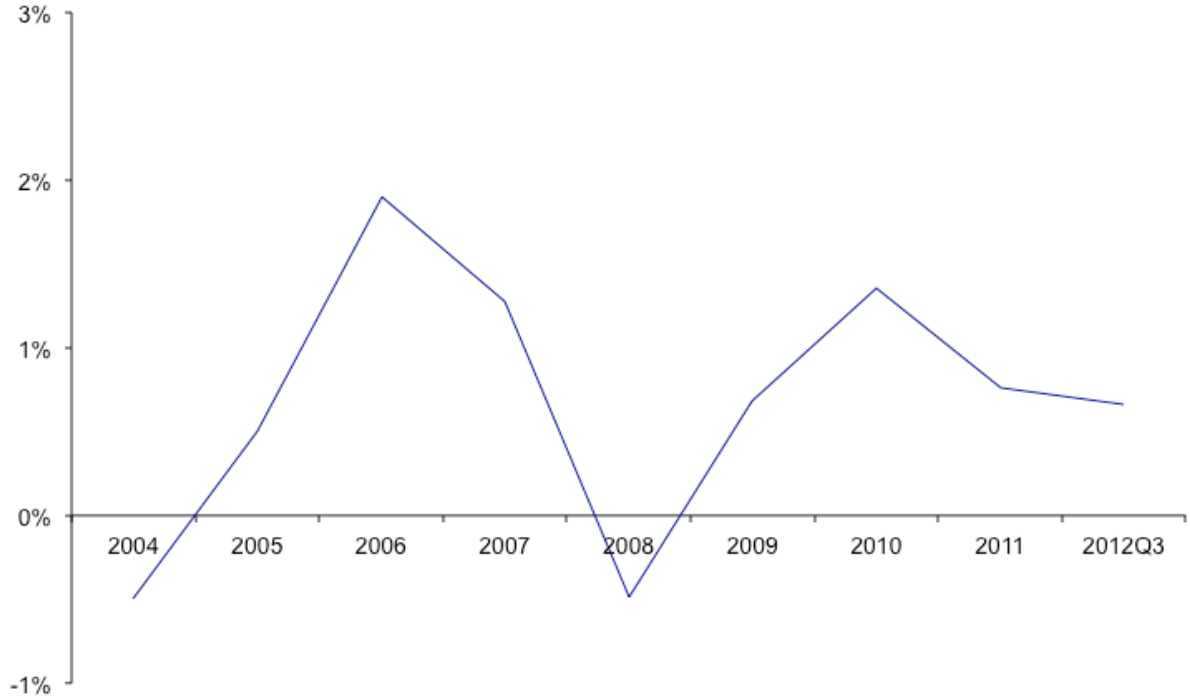
Table 4.12: Plant and equipment cost inflation

	Plant and equipment cost increases
2012/13	2%
2013/14	3%
2014/15 and thereafter	4%

4.5 IT

The prices of IT hardware and software are notoriously difficult to track on a consistent, like-for-like basis. After suspending the publication of its corporate IT price indices in 1999, the ONS launched a new data series in 2005 as part of its experimental service producer price index. Figure 4.13 plots the data.

Figure 4.13: Business IT cost increases



Source: ONS.

Our reading of this chart is that we should provide for input price increases of 0.75% per annum going forwards.

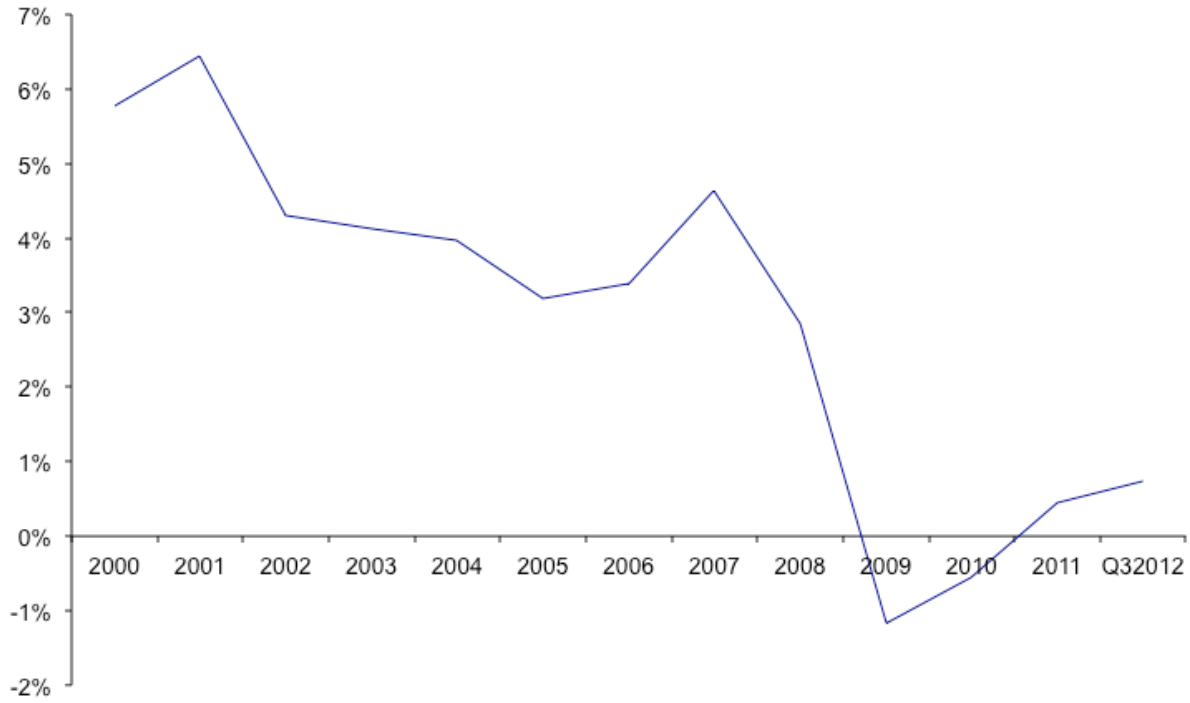
Table 4.14: IT cost inflation

	IT cost increases
2012/13 and thereafter	0.75%

4.6 Rents

There is also a series for property rentals within the ONS service producer price index.

Figure 4.15: Property rental increases



Source: ONS.

This chart shows a very clear relationship with GDP growth. Looking forwards, the expectation in most quarters is that property prices and property rentals will begin to increase slowly in the 2-3 years ahead as the economy starts to grow again before reverting back to normal rates of growth thereafter.

The OBR in its forecasts assumes that residential housing costs will move in line with average earnings growth. The residential and commercial sectors are very closely linked and it seems appropriate as a central case estimate to apply the same assumption to property rentals.

Table 4.16: Property rental inflation

	Property rental increases
2013/14	2.2%
2014/15	3.0%
2015/16	3.9%
2016/17	4.0%
2017/18	3.9%
2018/19 and thereafter	4.25%

4.7 Summary

Table 4.17 contains an overall summary of the estimates emerging from the above analysis.

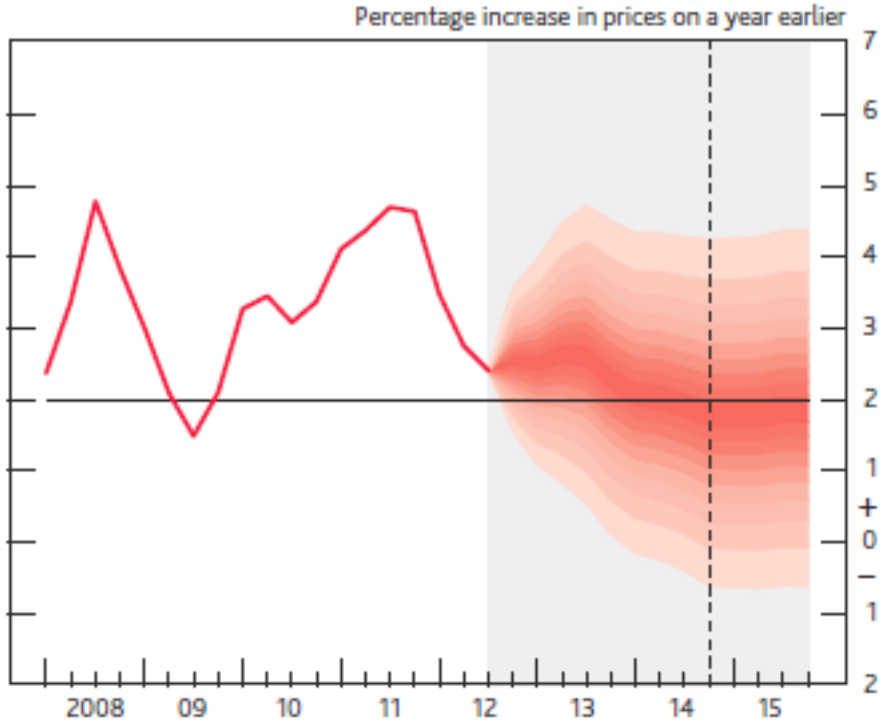
Table 4.17: Input price inflation forecasts (%)

	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19 to 2022/23
Labour – general	2.2	3.0	3.9	4.0	3.9	4.25
Labour – specialist	3.45	4.25	5.15	5.25	5.15	5.5
Materials – general/civils	3.5	4.5	4.5	4.5	4.5	4.5
Materials – electrical	3.0	5.0	5.0	5.0	5.0	5.0
Plant and equipment	3.0	4.0	4.0	4.0	4.0	4.0
IT	0.75	0.75	0.75	0.75	0.75	0.75
Property rentals	2.2	3.0	3.9	4.0	3.9	4.25

5. RPI

Having opted to anchor our analysis to the GDP forecasts prepared by the OBR and the Bank of England, it is only logical that our forecasts of RPI-measured inflation are derived from the same sources. Figure 5.1 and table 5.2 reproduce the projections found in the Bank's November 2012 Inflation Report and the OBR December 2012 economic forecasts.

Figure 5.1: The Bank of England's November 2012 CPI Forecasts



Source: Bank of England.

Table 5.2: OBR's December 2012 inflation forecasts

	Percentage change on a year earlier, unless otherwise stated						
	Outturn	Forecast					
	2011	2012	2013	2014	2015	2016	2017
Inflation							
CPI	4.5	2.8	2.5	2.2	2.0	2.0	2.0
RPI	5.2	3.2	3.0	2.6	3.1	3.4	3.7
GDP deflator at market prices	2.7	2.3	2.0	2.0	2.0	2.0	2.0

Source: OBR.

As always with these forecasts, CPI-measured inflation is assumed to come more or less into line with the government's 2% target two years from now and stay at 2% thereafter. In the intervening 24 months, the forecast has CPI-measured inflation noticeably above target as the aftermath of the significant import price shock that hit the UK between 2009 and 2011 continues to impact upon consumer prices.

The most interesting part of the numbers is the forecast of RPI-measured inflation that sits alongside the CPI numbers. Between 2012 and 2014 RPI-measured inflation moves in broadly the same way as CPI-measured inflation. Thereafter, a bigger wedge opens up between the RPI and CPI inflation rates. This surprisingly large gap is explained by the OBR to be a function of two main factors:

- a temporary divergence between the two measures of inflation caused by the upward movement in mortgage interest rates (which are included in the RPI basket but not the CPI basket) back to 'normal' levels; and
- a more permanent widening of the gap that naturally exists between CPI- and RPI-measured inflation from around 0.5 to 0.8 percentage points historically to around 1.4 percentage points going forward.

Box: The long-run gap between CPI- and RPI-measured inflation

In a working paper published alongside its November 2011 forecast document, the OBR explained that the government's 2% annual CPI inflation target is now best thought of as converting to annual RPI-measured inflation over the long term of 3.3% to 3.5% per annum. This is a noticeably higher number than anyone has ever talked of before. (In previous price reviews, Ofgem has typically converted the government's 2% CPI inflation target to RPI-measured inflation of 2.5% to 2.8% per annum.)

The 1.3 to 1.5 percentage point gap between the two measures of annual inflation is attributable to three factors. Two are linked to housing costs:

- the RPI measure of inflation includes the effects of rising house prices, but CPI does not. If one assumes that house prices in the long term rise with average earnings growth, and if average earnings go up by around 4% to 4.5% in normal economic conditions, this serves to pull RPI inflation up by around **0.35 percentage points** per annum; and
- the RPI measure also includes the effects of changes in mortgage interest payments. CPI does not. If mortgage interest rates can be assumed to be stable over long horizons,

mortgage interest payments will move up in line with house prices. This is thought to add another **0.15 percentage points** per annum to RPI inflation.

The third driver of the difference between CPI- and RPI-measured inflation is something known as the 'formula effect'. This is a reference to the way in which the CPI measure of inflation collates the tens of thousands of different prices collected by the ONS statisticians using geometric averages, whereas the RPI measure of inflation makes use of arithmetic averages. As a mathematical fact, geometric averages of non-identical numbers will always be lower than arithmetic averages, meaning that CPI will always show lower increases than RPI even if the two measures are using exactly the same source data.

Historically, the so-called formula effect has been a very stable 0.5 percentage points per annum. However, in recent months the effect has been measured at around 1.0 percentage points per annum. The ONS attributes this increase to changes in the way that it is measuring certain prices, most notably the prices of clothing and footwear. Specifically, because the ONS is now using a much larger number of data points to track the price of clothes and shoes, the dispersion in the data set has grown and the gap between geometric and arithmetic averages has widened.

Now that the ONS has confirmed that it will not be making any remedial changes to the RPI calculation, it is not tenable to assume that the formula effect will be the historical 0.5 percentage points per annum. The OBR in its forecasts allows for a formula effect in the future of **0.8 to 1.0 percentage points** per annum.

Added to the two other factors identified above, the net result is that RPI-measured inflation will sit naturally 1.3 to 1.5 percentage points above CPI-measured inflation.

RPI-measured inflation of 3.4% per annum is a higher run rate than we have included in our previous forecasts and means that any given nominal rate of input inflation will now convert to a lower rate of real input price inflation relative to RPI (but not, for the avoidance of doubt, to a higher rate of real input price inflation relative to CPI).

Our RPI forecasts follow the December 2012 OBR financial year projections as set out below.

Table 5.3: RPI-measured inflation forecasts

	RPI-measured inflation
2013/14	2.8%
2014/15	2.8%
2015/16	3.2%
2016/17	3.5%
2017/18	3.7%
2018/19 and thereafter	3.4%

6. Conclusions and Interpretation

Table 6.1 combines the numbers in sections 4 and 5 into overall calculations of RPEs.

Table 6.1: First Economics' RPE estimates

	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19 to 2022/23
Labour – general	(0.6)	0.2	0.7	0.5	0.2	0.85
Labour – specialist	0.65	1.45	1.95	1.75	1.45	2.1
Materials – general/civils	0.7	1.7	1.3	1.0	0.8	1.1
Materials – electrical	0.2	2.2	1.8	1.5	1.3	1.6
Plant and equipment	0.2	1.2	0.8	0.5	0.3	0.6
IT	(2.05)	(2.05)	(2.45)	(2.75)	(2.95)	(2.65)
Property rentals	(0.6)	0.2	0.7	0.5	0.2	0.85

The story that this table tells is slightly different from the one that we put forward in our June 2012 report, but aligns quite closely to Ofgem's RIIO-GD1 and RIIO-T1 estimates.

Compared to our June 2012 numbers, the RPE estimates in table 6.1:

- assume a later and slower recovery from recession;
- provide for more subdued nominal wage growth through to 2017/18 than previously indicated, consistent with the latest OBR forecast; and
- extend by one year to 2017/18 the period of time in which elevated RPI-measured inflation depresses overall RPEs.

The net result is that aggregate real input price is significantly lower than previously in 2013/14 and 2014/15, slightly lower than previously in 2017/18, but broadly similar to our previous forecast in all other years.

Ofgem's estimates and our forecasts:

- converge to similar long-term trends for wage growth and materials price increases (with our estimate of plant and equipment price inflation sitting significantly above Ofgem's estimate due to what we think is Ofgem's misunderstanding of the definition of 'equipment');
- give a similar overall RPE calculation for 2013/14; but
- diverge slightly in the period 2014/15 to 2017/18, when we see lower RPEs than Ofgem provided for in its final proposals.

As ever, there is opportunity for anyone using this analysis to cherry-pick from the different pieces of work and to produce either much lower or much higher numbers than either we or Ofgem recommend. We would caution against this and are happy to commend the estimates in table 6.1 as an intuitively sensible snapshot of likely RPEs over the next ten years.