Supporting Document 07

Determining our Allowed Revenue

General assumptions

Summary

Our Business Plan for the RIIO-T1 period (1 April 2013 to 31 March 2021) is the result of thorough engagement and consultation with stakeholders; described in the supporting document **Our customer and stakeholder engagement process**. This has been underpinned by our own in-house expertise, which has a proven track-record in terms of managing, maintaining and investing in our network for both today's and future customers.

The following document sets out, at a high level, how we intend to recover our costs over the RIIO-T1 period, the regulatory mechanisms that we will apply and the financial assumptions necessary to make our plans viable.

Many of these mechanisms mentioned apply in the current price control settlement, for example, pass through arrangements and logging up. For these mechanisms, we are not proposing to apply a different methodology from that already in place, but we have suggested some changes to the costs that should come under these mechanisms. For example, we believe it is more appropriate to put in place provisions to trigger a re-opener for costs relating to BT 21st Century Networks should costs exceed a materiality threshold.

In addition to the existing mechanisms, this annex sets out how we plan to recover our network investment costs using an appropriate mix of an **ex ante** provision for base and relatively certain costs, **revenue drivers** for less certain local enabling works and the **within period determination mechanism** for less certain wider works. It also sets out our approach to deal with the knock-on uncertainty of our capital programme on our operational expenditure. To this end, we have developed an **opex escalator**.

In terms of sharing any under and out performance achieved over the period, we question whether Ofgem's proposal to extend the **Information Quality Incentive (IQI)** to SHETL is the 'right' approach given the nature of our capital programme. However, if it is to be applied, we believe it must be limited to the *ex ante* capital expenditure allowance, with a sharing factor of 30%. We do not believe it is appropriate to extend any element of the IQI mechanism to the uncertainty mechanisms. Instead, where relevant, we believe these should be subject to their own, bespoke, incentive mechanisms and sharing factors. For the within period determination mechanism, where project costs are likely to be significant, we believe this should be, at most, 25%.

General assumptions

We also set out our position and view on the **mid-period review**. To avoid reducing RIIO-T1 to two 4-year price controls, we believe it is key that the scope of this review is clearly set out and is limited in its content.

Finally, but by no means least, we put forward the **financeability assumptions** necessary to make the overall settlement viable. This (and the uncertainty mechanisms relating to our capital programme) is the crux of the RIIO-T1 settlement for SHETL. To this end, we have set out our requirements for an automatic adjustment to the cost of capital and gearing assumptions for SHETL when the main construction period concludes. This reflects the specific risks SHETL faces as a small business with a large construction programme during the early years of RIIO-T1.

All costs shown in the document are in 2009/10 prices. Note that we do not discuss the Transmission Investment for Renewable Generation (TIRG) mechanism in this document, as we do not expect this (other than the application of indexation) to change in RIIO-T1.

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General assumptions

Inflation

Our Business Plan has been prepared in 2009/10 prices, but will be subject to **Retail Price Index (RPI)** inflation ahead of determining our allowed revenue within each year of the price control.

We acknowledge Ofgem's recent decision of 1 July 2011 to change the regulatory approach to RPI indexation. Whilst our support was for an approach that did not require forecasting, which we believe will result in unnecessary charge volatility, we will apply Ofgem's decision to all applications of RPI indexation including the TIRG mechanism from 1 April 2012.

Our Regulatory Asset Value (RAV), including forecast additions, will continue to be adjusted in line with full year RPI each year.

Real Price Effects

Real Price Effects (RPE) are inflationary pressures that our business is exposed to, over-and-above RPI. These are an important part of our cost forecasts, particularly as we will agree a fixed settlement for the period out to 2020/21.

In order to assist us in the preparation of this part of our Business Plan, we, along with National Grid Electricity Transmission and Scottish Power Transmission, commissioned a paper by First Economics to assess the level of RPEs over the RIIO-T1 period. First Economics' paper is attached to this document.

To incorporate RPEs within our Business Plan cost forecasts, we have used the output from this paper to calculate the likely impact of RPEs. In addition we have used our own assessments and calculations of the potential split of various categories of expenditure (load related capital expenditure, non-load related capital expenditure, direct operating costs, etc) between the various cost categories of labour, contractor and material costs.

Summary of First Economics RPE Assessment

Overleaf we replicate three tables that show the main results of First Economics' (FE) analysis.

General assumptions

FE Table 4.11 Input price inflation forecasts by main cost category (%)

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17 to 2020/21
Labour – general	2.0	2.5	4.1	4.4	4.5	4.25
Labour – specialist	3.25	3.75	5.35	5.65	5.75	5.5
Materials – general/civils	4.5	4.5	4.5	4.5	4.5	4.5
Materials – electrical	5.0	5.0	5.0	5.0	5.0	5.0
Materials – steel for pipelines	20.0	5.0	5.0	5.0	5.0	5.0
Plant and equipment	4.0	4.0	4.0	4.0	4.0	4.0

FE Table 5.3 RPI forecasts

	RPI-measured inflation
2011/12	5.2%
2012/13	3.4%
2013/14	3.5%
2014/15	3.6%
2015/16	3.8%
2016/17 and thereafter	3.2%

FE Table 5.1 RPE estimates by main cost category

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17 to 2020/21
Labour – general	(3.2)	(0.9)	0.6	0.8	0.7	1.05
Labour – specialist	(1.95)	0.35	1.85	2.05	1.95	2.3
Materials – general/civil	(0.7)	1.1	1.0	0.9	0.7	1.3
Materials – electrical	(0.2)	1.6	1.5	1.4	1.2	1.8
Materials – steel for pipelines	14.8	1.6	1.5	1.4	1.2	1.8
Plant and equipment	(1.2)	0.6	0.5	0.4	0.2	0.8

General assumptions

Our approach to RPE

To allow us to incorporate RPEs into our cost forecasts, we carried out the following analysis and assessments:

- To obtain a RPE rate for Direct Labour and Contracted Labour, we take a view of the mix within our proposed capital programme of general labour and specialist labour. To arrive at this composite rate we have reviewed the type of staff within SHETL involved in direct activities and our assessment of staff within our contractors. This was done at a high level and we have assumed a 50/50 split of general and specialist labour.

- From an analysis of a sample of historic and projected future capital projects, our engineering team has assessed the likely mix of materials split between civils and electrical. Based on this analysis, we believe that a 35% civil and 65% electrical split of materials is appropriate.

- The RPE rate we have applied for transport is based on the average composite RPE figure from the FE calculations. This is not highlighted in the FE report but has been provided to us as part of the back-up to its calculations.

- To arrive at the weightings for our capital expenditure, our engineering team has reviewed a number of completed projects and established the split between the cost categories. It has also examined and assessed the likely split for future projects. We have assumed the same weighting for each year of the forecast period.

- The weightings applied for our operating costs have been based on the actual split of cost categories in 2010/11 and an assessment of contractor costs between labour and materials. We have assumed the same weighting for each year of the forecast period.

Tariff forecasts

We are required to make our annual tariff forecast by 30 January of the preceding year. This means that not all the information necessary to make an accurate forecast of the tariff is known.

Currently, a retrospective adjustment to account for inaccurate forecasting is made through the **k-factor** term. We intend to continue to use the k-factor term in the RIIO-T1 period.

General assumptions

The k-factor currently incorporates a mechanism to penalise us if we forecast our tariff too high and, hence, over recover. For SHETL, this mechanism applies when we over recover by more than two per cent. It has been noted in joint working groups that there is an inconsistency in approach to the k-factor penalty mechanism between network licences. We are not aware of any reason for this divergence in approach and would support a move to align the electricity transmission licence with other networks.

Excluded services

We will continue to treat post-vesting connections, chargeable diversion works, telecoms rental income and outage change costs as **excluded services** in the RIIO-T1 period.

In addition, we believe our control room costs should be treated as an excluded service. These costs relate to the operation of the Western Isles, which SHETL undertakes on National Grid's behalf. SHETL's costs in carrying out this function are subsequently reimbursed by National Grid. It therefore stands to reason that these costs should be excluded from the price control recovery mechanism.

Force Majeure

We note Ofgem's position in its March strategy decision document to maintain the current **disapplication** provisions. We are not opposed to this decision *per se,* however, in a recent joint gas distribution network operator / transmission owner licence drafting working group, the inconsistency in approach between the two licences was raised. We are not aware of any reason for this divergence in approach and would support a move to align the electricity transmission licence with that of the gas distribution networks.

Mid-period review

In order to address the risks inherently associated with an eight year price control period, a mid-period review is proposed. If this is to successfully address these risks, and importantly not create new and unnecessary uncertainty, clear rules are needed for the operation and scope of the mid-period review. Such rules must seek to ensure the mid-period review is neither a "mini review" (creating a four-plus-four settlement) nor a "cursory glance" (that does not address substantive issues because they are considered outwith scope).

General assumptions

We strongly believe that Ofgem should clearly set out upfront the scope of the mid-period review to avoid undermining the move to an eight year price control period. To this end, our support is for a limited and succinct review with clear rules around the areas that are subject to review.

On the duration of the mid-period review, we believe a twelve month review process, even if this is intended to be an upper bound, will result in unwarranted and unhelpful uncertainty. Strategic decisions taken in the first half of the price control must not be undermined as a result of the review process. We agree that the mid-period review must not be used to make retrospective adjustments.

Finally, we believe the mid-period review should be subject to a two-way trigger, i.e. it should be capable of being triggered by either ourselves or Ofgem. This should be subject to high-level criteria that are underpinned by a materiality threshold. In particular, both output measures and cost allowances should be within the scope of the mid-period review. Whilst we recognise that currently changes to costs and drivers tend to be borne by the network companies, it is clear that over an eight year period there is significantly more potential for exogenous influences on input prices and/or drivers to change, and for the aggregate impact of several individually hitherto seemingly insubstantial increases to have a material impact.

We strongly believe that any mid-period settlement proposal should be able to be referred to the Competition Commission. This again relies on a clear set of rules for the mid-period review. In particular, a referral should be possible where a licensee requests a mid-period review and the Authority rejects that request.

Cost recovery and managing uncertainty: Unknown external costs

Cost recovery and managing uncertainty: Unknown external costs

Pass through costs

We believe it is appropriate to maintain the current TPCR4 pass through arrangements for licence fees, network rates, costs incurred as a consequence of temporary physical disconnection at the request of the system operator and the income adjusting event term. This includes the obligation to use reasonable endeavours to minimise the amount payable for network rates.

These existing arrangements recognise costs that may come forward in the period that are outside our control. We are not aware of any policy changes that warrant a change to these arrangements for the RIIO-T1 period and therefore propose to recover RIIO-T1 costs in line with the existing pass through arrangements.

We have, however, identified a need for two new categories of income adjusting event in RIIO-T1:

- To reflect the planned investment in subsea cables and the resulting potential for subsea cable faults. Subsea cable faults in the RIIO-T1 period are unlikely to be any reflection of the asset age or wear and tear, yet these faults have the potential to be costly and drawn out given the global demand for the vessels, equipment and expertise necessary for their repair. As such, we believe it is necessary to bring these costs under the income adjusting event within the pass through arrangements. A corresponding adjustment will also be required to the list of exceptional events under the network reliability incentive scheme.

- To reflect the potential for significant legislative or legislative-driven changes at Scottish, UK and European level during the period. In particular, we are mindful of the development of European Network Codes that could fundamentally affect the way we develop our network.

  We note that the existing income adjusting event provisions refer to an event arising from an amendment to the System Operator – Transmission Owner Code (STC). We believe that this should be extended to include legislation, licence change or other code changes.

Re-openers

Whilst we prefer to limit the use of re-openers, we believe there is a case in RIIO-T1 to include provisions for a re-opener for efficiently incurred costs relating to BT 21st Century Networks (BT21CN). There is ongoing uncertainty over the

Cost recovery and managing uncertainty: Unknown external costs

timetable for the implementation of BT21CN, the potential withdrawal of older platforms and whether BT will offer the equivalent services going forward. However, it is becoming increasingly apparent that any costs could potentially be significant.

Given that we do not want to introduce re-openers unnecessarily, we believe the best approach would be to establish a materiality threshold; to this end, we suggest 1% of base revenue. Costs incurred below this threshold level would be logged-up (see below), with an *ex post* efficiency assessment and RAV / cash adjustment at the end of the period (including an appropriate adjustment for financing costs). However, where costs exceed (or are forecast to exceed) the materiality threshold, SHETL has the means to apply for a re-opener and to recover these costs within the period. We believe this is the most pragmatic solution.

Logged-up costs

We have discussed above our proposed 'hybrid' approach to BT21CN costs. Whilst we believe it is prudent to retain an element of logging-up of these costs, given their potential scale, we believe the fallback position of a within period re-opener is warranted.

We believe that there are three further cost categories of uncertain costs that should be subject to the logging-up mechanism:

- The cost of compensating landowners under their wayleave agreement or deed of servitude.
- The cost of improving security at sites of Critical National Infrastructure, including network data and software security.
- The cost of works to address visual amenity concerns where these are not part of capital expenditure in our Business Plan.

As per previous price controls, all logged-up costs will be subject to an *ex post* efficiency review at the end of the price control period. Where costs are deemed to have been efficiently incurred, a one-off RAV / cash adjustment will be made at the end of the price control. SHETL will be held whole as a result of logged-up expenditure, i.e. any adjustment will reflect the costs of financing this expenditure during the period.

Cost recovery and managing uncertainty: Costs associated with the growth of our network

Cost recovery and managing uncertainty: Costs associated with the growth of our network

As described in our supporting document **Our approach to developing our Business Plan**, we have made every effort to submit a robust, well-thought through, justified Business Plan for the RIIO-T1 period.

An important principle to the development of our Business Plan is to identify uncertain costs, and then apply a cost recovery mechanism that ensures strong incentives on us to reduce costs and ensure that the cost paid by the customer is reflective of the costs we incur.

The mechanisms set out in the previous sections allowing us to recover appropriate costs and manage uncertainty relate to those costs that are associated with third parties and, hence, not in our direct control; for example, costs relating to licence fees, providing critical national infrastructure and the possible replacement of BT21CN.

However, such mechanisms are equally required, if not more so, in respect of some costs that, at face value, are in our direct control. Such mechanisms are intended to ensure that users of our network are not exposed to forecast costs that do not materialise and, by the same token, that we are not exposed to costs, which despite this robust review process, are not forecast.

The following section sets out how we seek to recover and manage the uncertainty relating to our investment in and operation of the network over the RIIO-T1 period. We also describe how we can be incentivised to ensure we control costs. It is vital that appropriate mechanisms are put in place to recognise and respond to this.

Cost uncertainty

Our forecast costs have different levels of certainty.

In submitting our Business Plan, we have identified an underlying base of relatively certain costs. These include:

- load and non-load related capital expenditure;
- costs relating to the connection of new renewables where we are already contractually committed or have a strong degree of certainty over the works;
- system reinforcement costs for which we already have Ofgem approval or, again, a strong degree of certainty; and
- costs relating to network design works.

For all three of our future network growth scenarios, described in the supporting document **Information to support our proposed growth capital expenditure**

Cost recovery and managing uncertainty: Costs associated with the growth of our network

programme, these 'base' costs amount to around £1 billion. Given the certainty with which we will incur these costs, allowances for these costs will be on an ***ex ante* basis**.

Any efficient under or over-spend against this *ex ante* allowance will be subject to an efficiency sharing factor. For base, *ex ante* costs we believe an appropriate sharing factor is in the region of 30%. This is discussed below.

In addition to these base costs, we identify two other categories of expenditure:

- costs relating to the connection of new renewables where we do not have certainty over the works; and
- system reinforcement costs for which we do not currently have strong certainty over the need for the works.

This first category is associated with the new network that we will need to build to connect new renewable generators. Some of the expenditure to do with this activity is certain and, hence, is included in our base cost forecast referred to above. However, some of the expenditure is uncertain. This is as we look later in the RIIO-T1 period where we cannot identify particular projects or projects are ill-defined.

We propose that these less certain costs are accommodated under the **connections revenue drivers**, which we have developed as part of our Business Plan.

The aforementioned base *ex ante* allowance provides for 1,258 MW of generation to be connected directly to SHETL's network during the RIIO-T1 period and the delivery of 1,096 MVA of additional capacity through shared-use infrastructure to accommodate new generation. However, should the volume of generation seeking connection during the RIIO-T1 period exceed these thresholds, funding for the resultant local enabling works, i.e. both any sole-use and shared-use infrastructure, will be met through the proposed revenue drivers. This will increase our allowed revenue in response to capacity delivered. The detail behind these mechanisms is set out in our supporting document **Information to support our proposed growth capital expenditure programme**. Any local connection assets for generators connecting directly to our transmission network will be paid for in full by the customer. As such, they sit outside the mechanisms discussed here.

The second category of uncertain costs relates to the Large Capital Projects (LCP) that will be necessary to accommodate the increased flows of renewable

Cost recovery and managing uncertainty: Costs associated with the growth of our network

energy on our network. We know what these projects are, but we don't yet know when the right time will be to build them. The right time is when we have enough certainty that the generation is going to be in place to use the assets. We don't want to build too soon, or too late.

We propose to use a within period determination mechanism to allow funding for these projects when the needs case can be demonstrated. By waiting until the needs case is made, customers are not asked to pay for these schemes too early. Again, the detail behind this mechanism is set out in our supporting document **Information to support our proposed growth capital expenditure programme**. This mechanism builds on the current Transmission Investment Incentives mechanism developed as part of the Government's Transmission Access Review in 2009.

Operating Cost Escalator

Given the uncertainty with our growth capital expenditure, it is extremely difficult to accurately assess our future operating costs. For this reason, we have made a distinction between our 'business as usual' operating costs and additional operating costs that are incurred following the completion of LCP. It is this second category of costs that is uncertain and, as such, we are proposing that they should be subject to an uncertainty mechanism.

We are proposing that an Operating Cost escalator is used to automatically allow the future operating costs of new LCP. Because this mechanism applies automatically, it will cover for the uncertainty of timing and future level of operating costs associated with new LCP.

There is a regulatory precedent for this mechanism. In TPCR4, the Deep Revenue Driver mechanism included an automatic allowance of 1% of the Gross Asset Value (GAV) for operating costs associated with new LCP.

Within our Business Plan we have included an automatic escalator of 1% of GAV for new LCP. The escalator would be an integral part of the Within Period Determination mechanism, so would automatically reflect the actual outturn.

The Operating Cost escalator would be triggered in the year following completion of the new LCP. For the central case in our Business Plan, the escalator would result in additional operating costs of £18.2 million p.a. by 2020/21.

Cost recovery and managing uncertainty: Costs associated with the growth of our network

This escalator would cover all direct operating costs, closely associated indirect costs, and IT and insurance premium related costs associated with new LCP.

Information Quality Incentive

The Information Quality Incentive (IQI) mechanism is a regulatory device that is designed to drive network operators to put forward realistic and credible cost forecasts for the forthcoming period.

Operators that submit costs in line with Ofgem or its consultants' views are awarded an upfront 'cash' uplift in recognition of this and awarded a higher efficiency incentive rate for the period. This means that they are able to retain a higher share of any under-spend against allowance during the period and, historically (and, we would argue, perversely), a higher share of any overspend.

To our knowledge, this mechanism has worked well in electricity distribution where network operators have tended to converge towards Ofgem's or its consultants' view of costs. However, we are less clear that this is the right mechanism for SHETL, particularly over the course of RIIO-T1 given the scale of our capital programme and the uncertainty over its timing.

As set out earlier in this section, SHETL is forecasting significant expenditure in the RIIO-T1 period on new LCP. However the timing / phasing of this expenditure is extremely uncertain as it depends on schemes that may or may not advance to construction during the RIIO-T1 period.

Our forecast capital expenditure can be broken down into three elements:

- Relatively certain expenditure that cuts across all elements of our business, for example, costs relating to already committed or approved works;
- less certain expenditure relating to sole use and shared infrastructure required to connect renewable generation; and
- highly uncertain expenditure relating to future LCP.

The main source of uncertainty in terms of this expenditure stems from the profiling of this spend over the RIIO-T1 period. This is accentuated by the significant cost and size of some of these projects. Whilst the first of the three elements set out above will be met through the *ex ante* allowance, the

Cost recovery and managing uncertainty: Costs associated with the growth of our network

remaining two elements will be met through the appropriate uncertainty mechanisms: revenue drivers and within period determination respectively. As discussed above, these mechanisms ensure that any funding over and above our *ex ante* allowance is in line with actual activity during the period.

Our total capital expenditure forecast is between £2-6.5 billion. Importantly, the *ex ante* element accounts for just £1 billion of our forecasts regardless of the eventual outturn scenario; this means that the remaining £1 to £5.5 billion will be accommodated through the uncertainty mechanisms.

We do not believe that the IQI mechanism should apply to the revenue driver or within period determination mechanism. Rather, as we describe above, these mechanisms have their own incentive properties.

While we are broadly comfortable with an IQI-type mechanism being applied to our *ex ante* base forecast; however we question what this will achieve on two counts.

Firstly, and as set out above, historically, the IQI mechanism has been introduced in order to drive network operators' forecasts towards Ofgem's (or its consultants') view of costs, which in turn dictates the sharing factor that will apply to any under- or over-spend during the period. However, we do not expect our view of base costs to vary markedly from Ofgem's (or indeed its consultants') view of costs given the basis on which these have been put forward. In this regard, it is important to realise that transmission expenditure tends to be a small number of large value projects, compared with the large number of small value projects in electricity distribution. It is therefore questionable what this will achieve.

Secondly, even if there was to be a difference between the two forecasts, we do not believe that a sliding scale incentive will necessarily drive any refinement / narrowing of the gap between Ofgem and our own cost forecast. In particular we note that our expenditure forecasts are heavily driven by renewables connections work.

Our capital programme places SHETL at higher business risk over the RIIO-T1 period. Given this, we need to take a balanced approach to the amount of risk we accept through incentive mechanisms. This is a key consideration for our financial assumptions.

At present, capex under- and over-spends are subject to a 25% sharing factor. We have long taken the view that this level of exposure is about right for

Cost recovery and managing uncertainty: Costs associated with the growth of our network

base capital expenditure in electricity transmission. Ofgem has proposed that for RIIO-T1, the sharing factor should increase to between 40% and 50% via the IQI mechanism; this marks a significant step change from the current regime. We are concerned that Ofgem has proposed this increase in the sharing factor without detailed consideration of the impact of this on electricity transmission businesses; and in particular the knock-on affects associated with increased business risk.

To this end, we believe a more appropriate sharing factor for our *ex ante* capital expenditure allowance over the RIIO-T1 period is 30%. This recognises Ofgem's desire to increase on the current sharing factor, but is tempered by a view of our overall business risk. To increase the sharing factor above 30% would, in our view, warrant an increase in the cost of equity.

Finally, if Ofgem is to adopt an IQI-type mechanism, then it is critical to ensure that comparisons are between like-for-like costs and are cognisant of the different possible approaches where they achieve the same set of outputs. In electricity distribution, specific cost categories were excluded from the mechanism, namely indirects, non-operational capex, work force renewal costs and real price effects. It will also be necessary to exclude certain 'building blocks' from any IQI-type mechanism under RIIO-T1.

Our financial assumptions

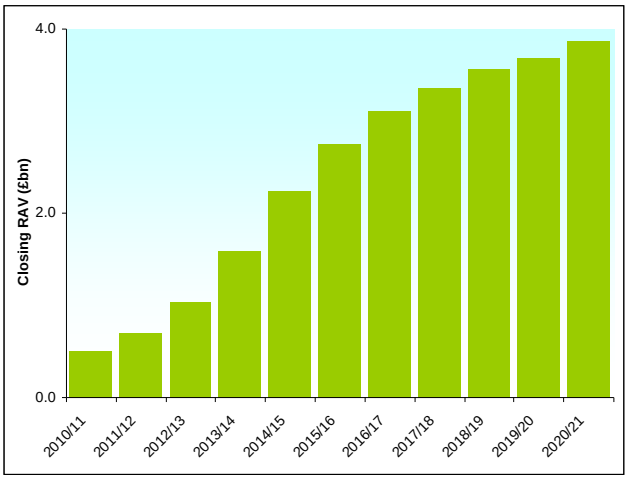
Our financial assumptions

This section summarises the financial assumptions that underpin our Business Plan for the RIIO-T1 period from 1 April 2013 to 31 March 2021.

During the Business Plan period, SHETL is expected to grow significantly. At 31 March 2011, the Regulatory Asset Value (RAV) of the business was £512 million. By 31 March 2021, for the central case in our Business Plan, the RAV is forecast to be £3,866 million (Figure 1). When inflation is taken into account, this will represent a near ten-fold increase in ten years.

The financial assumptions we have made in preparing our Business Plan reflect the unique financing challenges associated with a rapidly growing business. The fact that our financial considerations are 'not normal' was recognised in Ofgem's March 2011 Strategy paper[1]. In that paper Ofgem stated that licensees might make assumptions different to those in its Strategy paper, so long as there was sufficient justification. As we describe below, we believe that there is strong justification that SHETL requires a bespoke financing package.

Figure 1 Forecast closing RAV for the central case in our Business Plan



In considering the development of our business over the coming decade we distinguish between a period of intense growth followed by a period of sustainable growth (Figure 2):

§ **Intense growth** is characterised by annual capital expenditure exceeding 25% of the prevailing RAV and exceeding 100% of annual revenue.

§ **Sustainable growth** is characterised by ongoing capital expenditure on new assets, but the business has grown to sufficient size for this to be nearer a 'business as usual' position.

[1] Decision on strategy for the next transmission price control – RIIO-T1, 31 March 2011.

Our financial assumptions

Figure 2 Annual capital expenditure as % of closing RAV and as % of allowed revenue

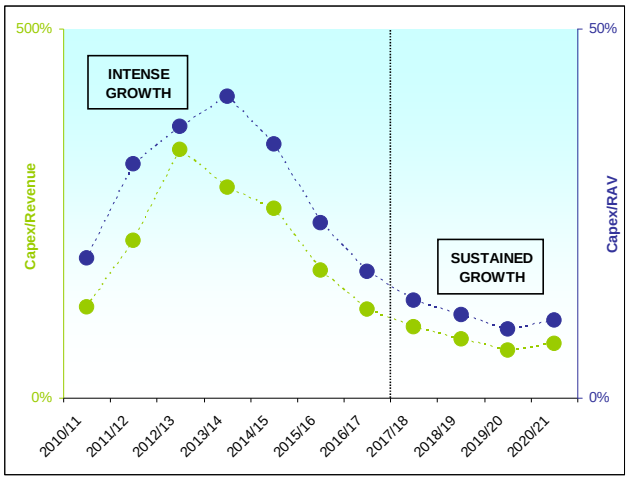


Figure 3 Our financial assumptions

	INTENSE GROWTH	SUSTAINABLE GROWTH
Applicability	RAV <£3.25 bn	RAV >£3.25 bn
Cost of equity	8.25%	7.5%
Cost of debt	Bespoke index with 72 bps uplift	
Notional gearing	50%	55%
Depreciation	45 years sum-of-digit on new assets from 1 April 2013 (except TIRG)	
Capitalisation	Actual ratio of capex to opex	
Equity issuance	5% notional new equity	

Our financial assumptions are different for the intense growth period and the sustainable growth period. Our financial assumptions are summarised in **Figure 3**.

Applicability

We propose an automatic trigger to switch between our financial assumptions for the intense growth period and the sustainable growth period.

As illustrated in **Figure 2**, for the central case in our Business Plan, the transition from intense growth to sustainable growth will occur in 2017/18. In 2017/18, the RAV exceeds £3.25 billion for the first time (**Figure 1**). When SHETL's closing RAV is less than £3.25 billion, then the intense growth financial assumptions will apply. However, when SHETL's closing RAV exceeds £3.25 billion there will be an automatic transition to the sustainable growth assumptions.

Our financial assumptions

Cost of equity

In order to finance the capital expenditure requirement of the period of intense growth we will need to attract sufficient new equity to maintain the creditworthiness of our business. At the same time, the significant levels of construction – including on new technologies in new situations – will increase our business risk. This requires a relatively higher cost of equity during the intense growth period.

Cost of debt

We will also need to issue new debt. At 31 March 2011, SHETL's debt was £234 million; by 31 March 2021, for the central case in our business plan, we expect SHETL's debt to be around £2.25 billion. We forecast that over £2 billion new debt will be issued over the Business Plan period.

Given this, it is not viable to assume our cost of debt will be comparable to a 10-year simple trailing average index[2] as per the standard approach proposed by Ofgem. Thus, we require a bespoke approach that weights the index by our actual capital expenditure. In addition, we believe that there is strong evidence that the index must be uplifted by 72bps to allow for the real world costs associated with our forecast debt issuance.

Notional gearing

To maintain our credit ratios, in particular FFO/Debt, our actual gearing will be depressed during the intense growth period. Over the past five years, SHETL's gearing has been significantly below 60% - at 31 March 2011, actual gearing was 45%. For the central case in our Business Plan, we forecast that our gearing will be volatile, but below 60% until at least 2017/18. Thus we assume notional gearing of 50% during the intense growth period. We have assumed that our notional gearing will rise to 55% during the sustainable growth period.

Depreciation

Ofgem has determined that a key element of the RIIO price control principles is the use of economic asset lives as the basis of the regulatory depreciation period. Economic asset lives are a function of both the technical life of the asset and the useful life of the asset to end customers.

[2] Where the index is iBoxx GBP Non-Financials indices of 10+ years maturity with credit ratings of broad A and broad BBB.

Our financial assumptions

The nature of our capital investment programme means it is uniquely difficult to accurately determine economic asset lives. In particular:

- Our investment programme is largely driven by the need to create network capacity for new renewable generation. These generation schemes are 'first tranche' renewables, in an arena where technology is rapidly developing. Thus we believe that there is some uncertainty around the future life of these schemes including the potential for repowering to a higher output at a later date.

- We propose to invest in infrastructure that is at the technology frontier. Thus we have little evidence base of the useful life of these assets, including the timing of replanting.

Given this uncertainty, and the uncertainty surrounding the timing of our investment programme, we propose to front-load the depreciation profile of our assets using the sum-of-digit methodology. We apply this to the prevailing 45 year expected economic life of electricity transmission assets.

Capitalisation

The scale of our capital programme will distort our overall **capitalisation** rate during the intense growth period. Ofgem has proposed that a notional capitalisation rate is set upfront, based on the proportion of capex-like costs expected during the period. The variability of the ratio of our capital expenditure to operating expenditure means it is very difficult to set a sensible average rate. For example, at the peak of our intense growth period, 98% of our expenditure will be capex-like. Consequently, our Business Plan assumes that the actual capitalisation rate will be used.

Equity issuance

Ofgem propose to set an *ex ante* allowance of five per cent of notional new equity as calculated by the RIIO-T1 financial model. We support this proposal.

First Economics Report

Real Price Effects

Prepared for the GB Transmission Network Owners

30 June 2011

1. Introduction

This paper contains First Economics' estimates of the real price effects (RPEs) that are likely to confront the GB electricity and gas transmission networks over the period 2011 to 2021. It is intended to be a contribution to the business plans that the networks' owners are preparing as part of Ofgem's RIIO-T1 review.

The paper is structured into five main parts:

- section 2 outlines our methodology;
- section 3 explains the assumptions we are making about GDP growth and the ongoing recovery from the 2008-09 recession;
- section 4 provides forecasts of future labour and materials price increases;
- section 5 contains estimates of future RPI-measured inflation; and
- section 6 concludes.

2. Methodology

Our approach to forecasting input price inflation was set out in some detail in papers that we prepared for the electricity DNOs in DPCR5. There are three key parts to the analysis.

Input price inflation forecasts are to be anchored against the most likely path for GDP growth

The rate at which prices for labour and materials change over time is inextricably linked to the demand for those inputs: all other things being equal, the less that buyers want of a good or service the more difficult it is for the supplier to pass on price increases (and vice versa). The starting point in our work must therefore be a projection of the rate at which demand and output are likely to increase in the economy as a whole, which we can then interpret for each of the individual categories of input that we are having to consider in our analysis.

At the time of writing, the UK is still very obviously recovering from the effects of recession. By contrast, the global economy, powered by demand from outside of the US and the EU, is expanding rapidly. This means that we need to analyse both the national and global outlook and consider carefully which provides the most relevant anchor for our analysis of the price increases affecting each individual category of input.

Input price forecasts should be prepared on a nominal basis alongside a separate forecast of RPI-measured inflation

Arguably the key methodological issue that emerged during DPCR5 concerned the link between labour and materials cost increases and RPI-measured inflation. In all of our previous reports we made forecasts of nominal input price inflation and used a separate forecast of RPI in order to calculate the corresponding real price effects. Others have tended to forecast real terms cost increases more directly, often on the basis of the historical correlations between nominal input price inflation and RPI-measured inflation.

Our approach is considered and deliberate. As an overarching point of principle we do not believe that measures of real wage inflation or real terms material cost increases are sufficiently well-behaved to permit a researcher to estimate input price inflation less the increase in the value of the RPI index in one step. This is for two reasons:

- first, RPI is just one measure of inflation and one that happens to be heavily influenced by housing costs. This is an especially important consideration at the current time given that a return to 'normal' mortgage interest rates are going to push RPI up in the next 3-4 years without having any impact on CPI or the Bank of England's ability to meet its 2% inflation target (see section 5 for more on this). To imagine that real price effects tend to a constant when measured relative to an oscillating RPI benchmark is not credible at present; and
- second, in an era of inflation targeting it cannot be that increases (or reductions) in RPI feed directly into increases (or reductions) in nominal rates of input price inflation. If they did, the economy would be prone to price spirals in which a shock that temporarily pushed inflation up would generate a second round of price increases as workers and suppliers sought to preserve their real income growth, in turn pushing up RPI still further and generating a vicious circle of ever-increasing input prices and inflation – a phenomenon that would be causing considerable problems at the current time given the elevated level of inflation in the economy. We believe instead that it is medium-term inflation expectations that influence workers' wage demands, whilst we see materials costs very much as a driver of RPI-measured inflation rather than the other way around. We discuss this further in appendix 1.

This is not to say that nominal input price inflation and RPI are completely independent. Since RPI measures the rate at which prices in the economy are changing, and since prices over time move in line with costs, it must be that the rates of nominal input price increases and RPI-measured inflation are related. We think, however, that this link is best recognised by giving an overall sense-check to the results of the nominal input price inflation less RPI calculations rather than constraining the estimates of real price effects from the outset.

After a period of more than 1-2 years the experiences of the recent past provide the best guide to price increases in the future

No forecaster can ever claim that their predictions are 100% accurate and it is entirely natural for companies in June 2011 to be unclear as to what the 2013-21 period has in store for them, especially when the UK and the global economy is experiencing a sudden and unexpected period of restructuring.

We would, however, caution against being too believing of stories which maintain that the drivers of inflation from now on will be fundamentally different from the factors that influenced inflation in the years prior to recession. While some change is inevitable, it is impossible to say with any certainty what price pressures will be different and what impacts there will be on the inflation rates that we are analysing in this report. Rather than convince ourselves prematurely that there is to be a structural break from the past, we believe instead that observed pre-recession, pre-2008 data constitute a central or best available estimate of the price

increases that one can expect to impact on the transmission networks once the recovery from recession is over and the UK economy goes back to growing at a 'normal' rate.

In practical terms this means that most of our forecasts are built up in to two stages:

- we look first of all at the path of prices in the short-term when price increases will be heavily influenced by short-term expectations of economic growth; and
- we then turn to recent empirical data and try to identify an underlying trend in the rate of growth in wages and materials prices during recent years that exhibited normal economic conditions. We then extrapolate from this historical trend to produce medium- to long-term forecasts of (nominal) input price inflation.

We acknowledge that this methodology is not foolproof. However, we believe that the likely error in our forecasts is symmetrically distributed insofar as nobody at this moment in time can claim with any real credibility why it must be that price increases will settle onto higher or lower trends than those that could be observed prior to the onset of recession.

3. GDP Growth

3.1 Latest evidence

Our 2011-21 forecasting work begins with a brief summary of the economic outlook.

In our previous reports we have relied on HM Treasury and Bank of England projections of GDP growth. The HM Treasury's forecasts are now produced by the independent Office of Budgetary Responsibility (OBR), which in our view strengthens the case for using public-sector numbers rather than a more partial private-sector forecast as the anchor for RPE calculations. Accordingly, we present only the forecasts made by these organisations in the analysis that follows (while acknowledging that there is a reasonable range of views among other experts around these central estimates).

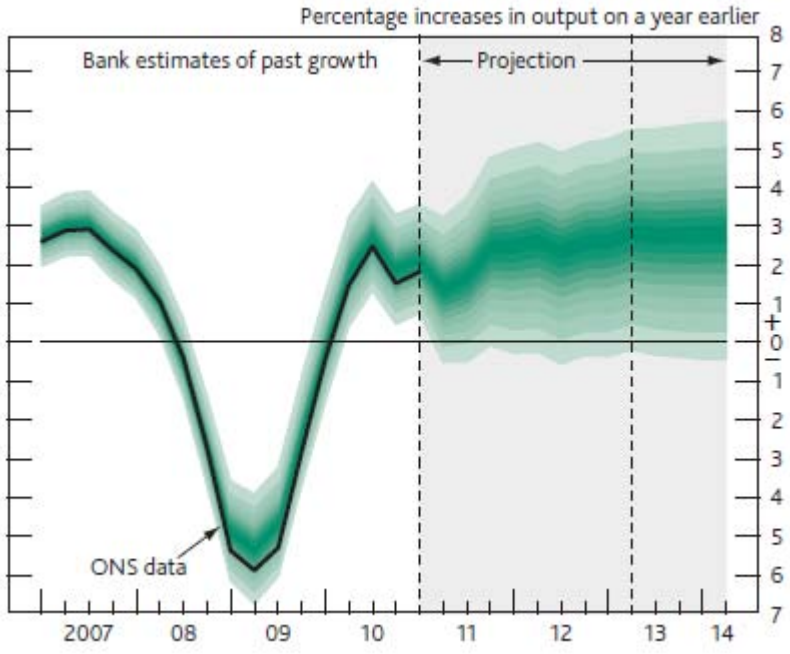
Table 3.1 and figure 3.2 reproduce figures that may be found in HM Treasury's April 2011 Budget and the Bank of England's May 2011 Inflation Report.

Table 3.1: HM Treasury's April 2011 forecasts of GDP growth

	Percentage change on a year earlier, unless otherwise stated						
	Outturn	Forecast[1]					
	2009	2010	2011	2012	2013	2014	2015
World economy							
World GDP at purchasing power parity	-0.7	5.0	4.2	4.3	4.3	4.4	4.4
Euro Area GDP	-4.0	1.7	1.4	1.8	1.8	1.9	1.9
World trade in goods and services	-11.1	12.7	6.9	6.8	6.9	7.0	7.0
UK export markets[1]	-11.4	10.7	5.8	5.8	5.8	6.1	6.0
UK economy							
Gross domestic product (GDP)	- 4.9	1.3	1.7	2.5	2.9	2.9	2.8

Source: HM Treasury.

Figure 3.2: The Bank of England's May 2011 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. In both cases, there is a year of transition in 2011 during which the rebalancing of the UK economy away from growth driven by household consumption and public-sector expansion and towards business investment and export growth depresses overall growth in output. Thereafter the UK economy is seen growing at close to 3% per annum – i.e. just above trend – from 2012 through to 2014 or 2015.

The Bank of England also helpfully identifies the key uncertainties around the central case. The main downside risk is around household expenditure and fears that reductions in real disposable incomes may cause some households to cut back sharply on their expenditure. Balanced against this on the upside, the Bank notes that companies are making historically large profits at present and could boost GDP growth if some of their surpluses were to be spent on new capital investments or transferred to workers in the form of higher wages. 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 fairly strong profile of GDP growth, due in large part to the very rapid recovery from the recession of 2008-09 outside of the US and Europe. Although there are risks to global growth, most notably from a slump back into recession in the US and/or the bursting of various bubbles that appear to have built up in China, the central case is one in which growth continues at a healthy and consistent rate from 2011 onwards.

Looked at side-by-side, the clear implication is that the demand for products that are bought and sold mainly in separate national markets will for a period of time look quite different from the demand for goods and services that are traded globally. For the purposes of our analysis, this might be expected to mean that there

are greater pressures on materials prices than on UK labour costs in the near term. We now consider to what extent this is apparent in recent data and what the prognosis is for the 2011 to 2021 period.

4. Input price inflation

4.1 Wages – general

Our analysis of wage increases for the majority of people that regulated networks employ has previously been focused around the ONS's average earnings index. This index was discontinued by the ONS in 2010 and observers have been directed instead to the newer average weekly earnings index for information on wage increases across the UK economy. Figure 4.1 plots the series for private sector wages including and excluding bonuses.

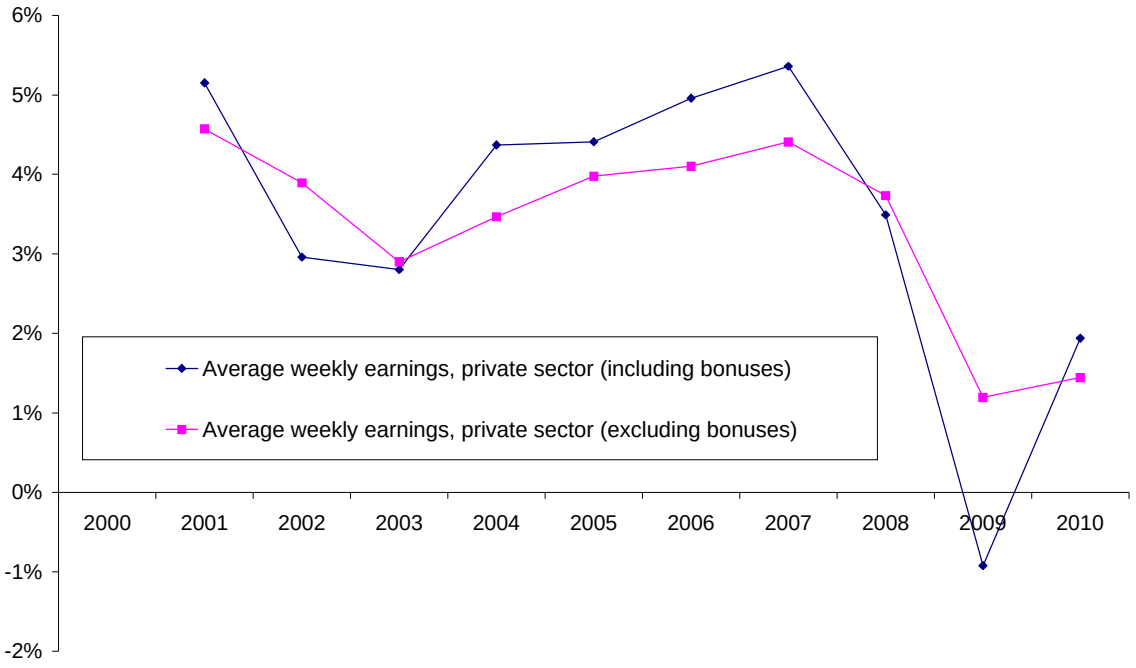


Figure 4.1: Private sector wage inflation

Source: ONS.

The chart shows a marked shift in wage pressures due to recession. After growing at an average annual rate of around 4% on both measures between 2000 and 2008, wages declined in absolute terms in 2009, after accounting for the effects of withdrawn bonuses, and then grew by less than 2% in 2010. The latest monthly data from April 2011 puts annual private-sector wage growth at 1.6% including bonuses and 1.8% excluding bonuses.

Going forward the expectation is one of subdued wage growth stretching over a period of up to 3 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 around 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 transmission networks 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.

HM Treasury's April 2011 Budget report gives a sense of what sort of increases firms should expect to have to pay during the next five years.

Table 4.2: Labour market forecasts

	Percentage change on a year earlier, unless otherwise stated						
	Outturn	Forecast[1]					
	2009	2010	2011	2012	2013	2014	2015
Labour market							
Employment (millions)	29.0	29.0	29.0	29.2	29.5	29.7	30.0
Wages and salaries	- 0.1	1.5	1.8	2.8	4.8	5.3	5.4
Average earnings[6]	1.8	1.7	2.0	2.2	3.8	4.3	4.5
ILO unemployment (% rate)	7.6	7.9	8.2	8.1	7.6	7.0	6.4
Claimant count (millions)	1.53	1.50	1.54	1.53	1.43	1.31	1.18

Source: ONS.

The projections have average earnings growth sticking stubbornly at around 2% during 2011 and 2012 before moving back towards normal levels in 2013. We use the financial year equivalents as the best available estimates of the wage inflation for general workers employed by the transmission networks in the period to 2015/16, as set out in table 4.3 below. From 2016/17 onwards we think it is prudent for the transmission companies 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
2011/12	2.0%
2012/13	2.5%
2013/14	4.1%
2014/15	4.4%
2015/16	4.5%
2016/17 and thereafter	4.25%

4.2 Wages – specialist

During DPCR5 we 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 was 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 transmission networks require. We assumed in the forecasts that we produced that this bargaining power would translate in to a premium of up to 1.5% per annum.

Data published during the last 2-3 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 2010. It shows that clearly that specialist wages have grown much more than average during and after the recession.

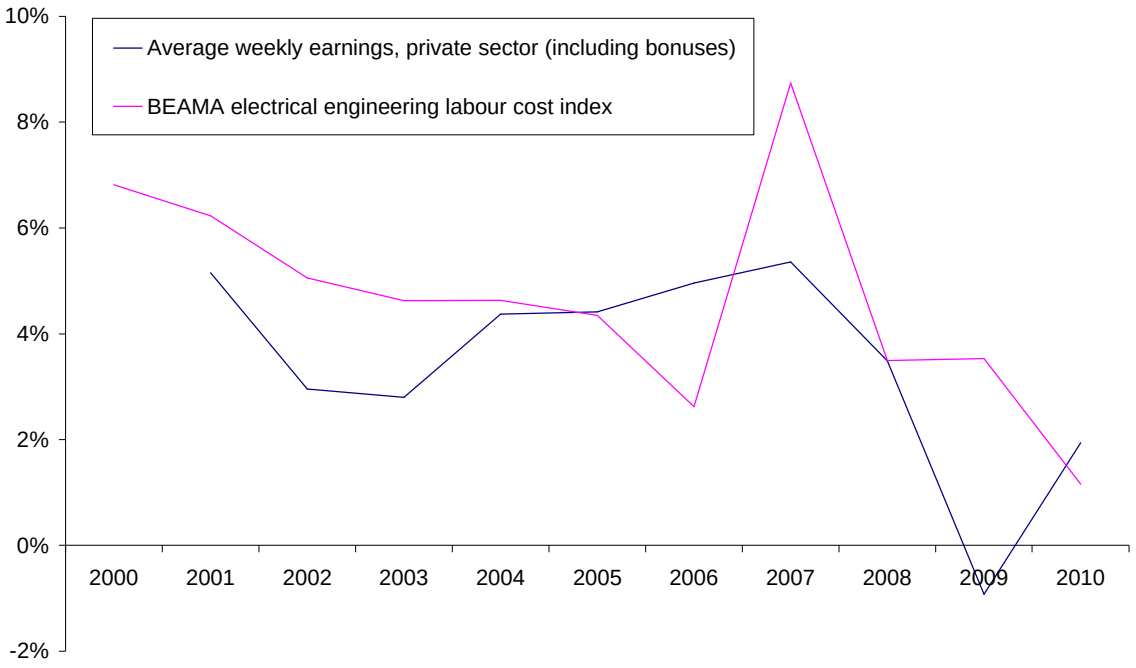
Table 4.4: Wage increases, 2010 vs 2007

Index	Growth
ONS: electricity, gas and water sector, incl. bonuses	9.5%
BEAMA: electrical engineering	8.4%
BEAMA: mechanical engineering	13.4%
BIS: electrical labour	14.2%
ONS: private-sector average earnings growth, incl. bonus	4.5%
ONS: private-sector average earnings growth, excl. bonus	6.5%

Source: ONS, BEAMA, BIS.

These latest three years of data add to the period over which specialist wage inflation has outstripped average earnings growth, as seen in the figure 4.5 comparison of the BEAMA electrical engineering series and average weekly earnings.

Figure 4.5: Wage inflation among electrical engineers



Source: ONS, BEAMA.

Going forward, demand for specialist skills is certain to remain high. The transmission networks have told us that they will be proposing a two- to five-fold increase in capital investment in the next regulatory period. In addition, 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 transmission networks 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 is prudent to add 1.25% to the base trend in average earnings for the specialist workers in the transmission networks' 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
2011/12	3.25%
2012/13	3.75%
2013/14	5.35%
2014/15	5.65%
2015/16	5.75%
2016/17 and thereafter	5.5%

4.3 Materials

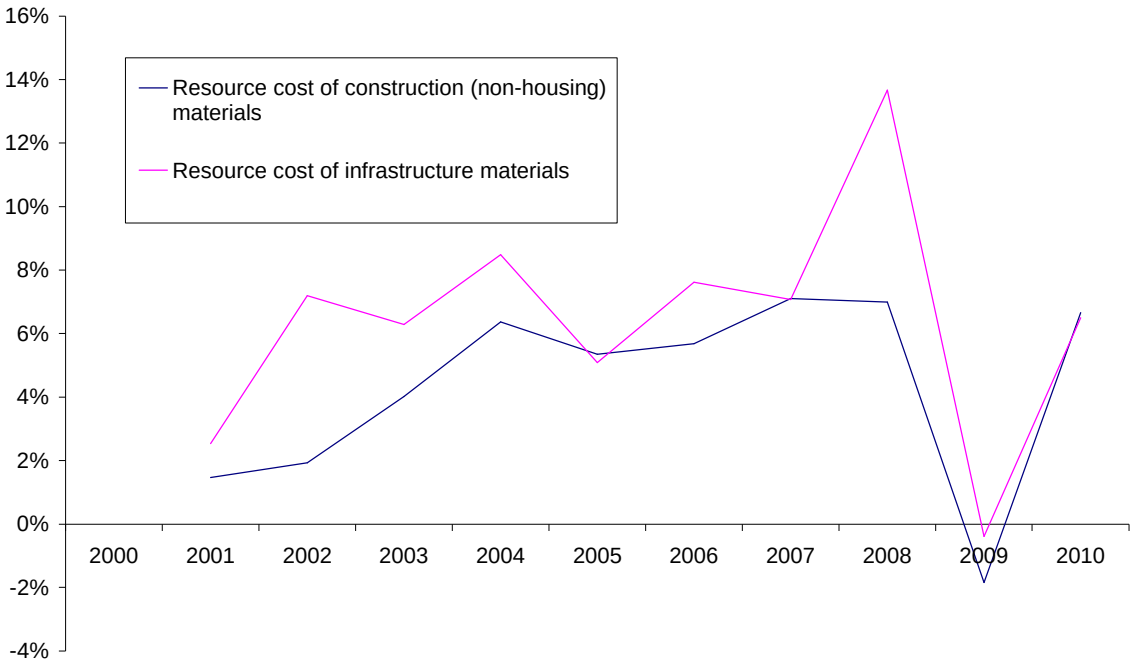
Materials have tended to be the hardest of all the items in the transmission input mix to forecast. Up until around ten years ago materials costs were typically flat or falling over time, just like the prices of most other physical goods. This picture then changed with the emergence of China and other developing economies as major consumers of raw commodities. Recession temporarily reined back most prices, but in the last 18 months companies have once again had to deal with significant price increases.

We consider the situation currently confronting the transmission networks 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 2000 to 2010.

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 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, as some parties did in DPCR5, that inflation will decelerate rapidly. 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 benchmark to factor into forward-looking RPE calculations.

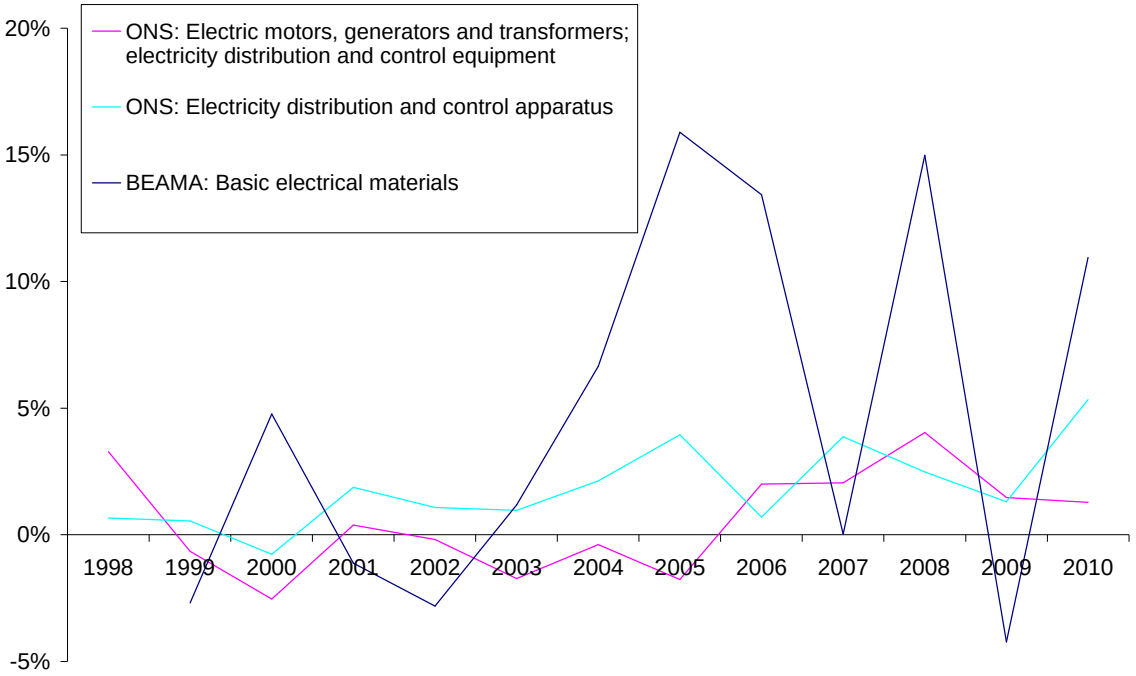
Table 4.8: Forecasts of general materials inflation

	Materials cost increases
2011/12 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 electricity transmission networks 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.

The chart shows that the BEAMA index has fluctuated considerably over time, often showing double-digit growth in one year followed by flat prices the year after. The ONS indices have been less variable and since 2006 have shown inflation of between 1% and 5% per annum.

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 strong and stable expansion (as shown in the OBR forecasts in table 3.1 above), the likeliest or central scenario has to be one in which the average annual increase in the BEAMA index will approach the compound 8% inflation rate seen between 2003 and 2010. Recognising that the ONS indices show a lower rate of price increases, we consider it is prudent for the transmission networks to factor in price increases of 5% per annum over the 2011 to 2021 forecast period.

Table 4.10: Specialist electrical materials cost inflation

	Specialist electrical materials cost increases
2011/12 and thereafter	5%

Materials – gas pipeline

The specialist materials that are relevant to the gas transmission network comprise mainly reinforced steel for new pipes. The two BIS indices which track the prices of specialised steel are shown in figure 4.11.

Figure 4.11: Reinforced/structural steel prices

Source: BCIS.

The vertical axis in this graph has a different scale to any of the previous charts. This reflects the fact that the steel which gas networks use has characteristics which make it close to a 'pure' commodity (whereas general materials and electrical materials have characteristics of manufactured goods, with a higher labour content to dilute the swings in global commodity prices). Smoothing our the bumps over time, the two series both exhibit price increases of close to 100% over the period 2003 to 2010.

Forecasting steel prices requires a huge amount of guesswork; as an illustration of this, when the FT conducted a survey of steel price forecasts for 2011 in January this year, estimates of year-on-year price increase ranged from 13% to 66%. The latest BEAMA data nevertheless show that prices in May 2011 sit 12-14% above the 2010/11 average and we therefore think it is prudent for NGG to factor a 20% increase in prices into the first year of its business plan forecasts. Thereafter we would advise allowing for a 5% increase in prices per annum to reflect continuing growth in global demand, albeit accepting that there is a very large confidence interval around this estimate and recognising that NGG and Ofgem may wish to seek the advice of someone with more sector-specific expertise than ourselves.

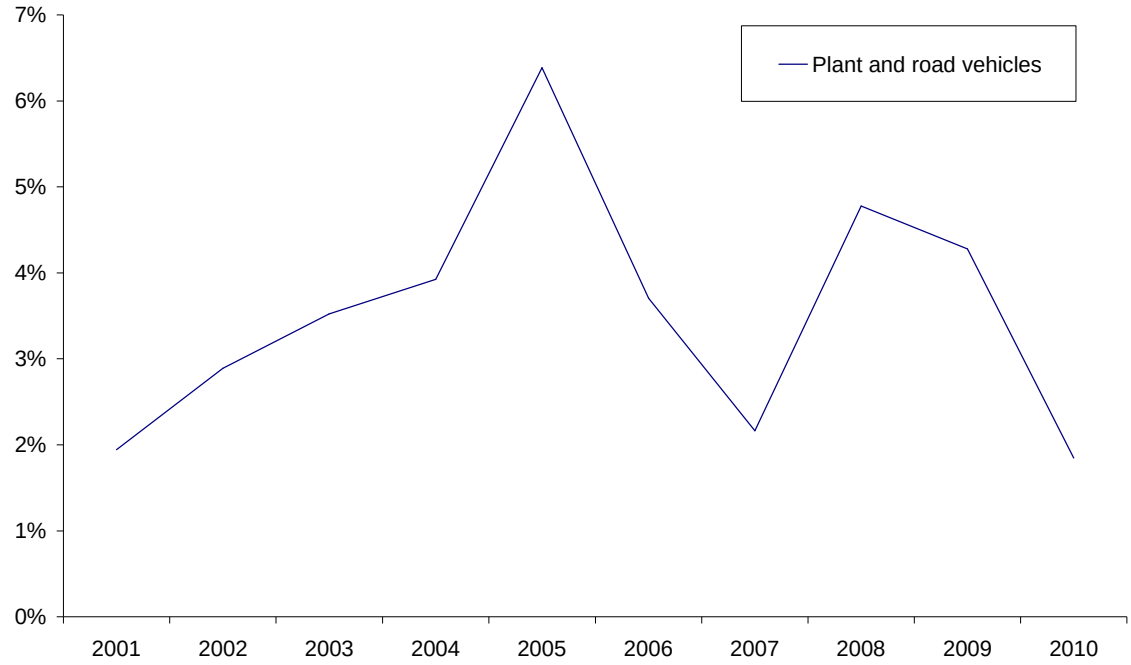
Table 4.12: Steel for gas pipelines cost inflation

	Specialist steel cost increases
2011/12	20%
2012/13 and thereafter	5%

4.4 Plant and equipment

The best indicator of the cost pressures impacting on the plant and equipment that transmission networks to repair and extend their networks is the BIS plant and road vehicles index. Figure 4.13 plots the annual change in this index over the period 2000 to 2010.

Figure 4.13: Plant and equipment cost increases



Source: BCIS.

Despite the significant reduction in demand brought about by the recession in the construction sector, the BIS index still exhibited inflation of 4.3% and 1.8% in 2009 and 2010 respectively. The average annual price increase pre-recession between 2003 and 2008 was just over 4%.

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 going forward. The most recent evidence does nothing to alter our views on this matter.

Table 4.14: Plant and equipment cost inflation

	Plant and equipment cost increases
2011/12 and thereafter	4%

4.5 Summary

Table 4.15 contains an overall summary of the estimates emerging from the above analysis.

Table 4.11: Input price inflation forecasts (%)

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17 to 2020/21
Labour – general	2	2.5	4.1	4.4	4.5	4.25
Labour – specialist	3.25	3.75	5.35	5.65	5.75	5.5
Materials – general/civils	4.5	4.5	4.5	4.5	4.5	4.5
Materials – electrical	5.0	5.0	5.0	5.0	5.0	5.0
Materials – steel for pipelines	20.0	5.0	5.0	5.0	5.0	5.0
Plant and equipment	4.0	4.0	4.0	4.0	4.0	4.0

5.1 RPI

Having opted to anchor our analysis to the GDP forecasts prepared by the Bank of England and HM Treasury, 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 May 2011 Inflation Report and HM Treasury's April 2011 Budget report.

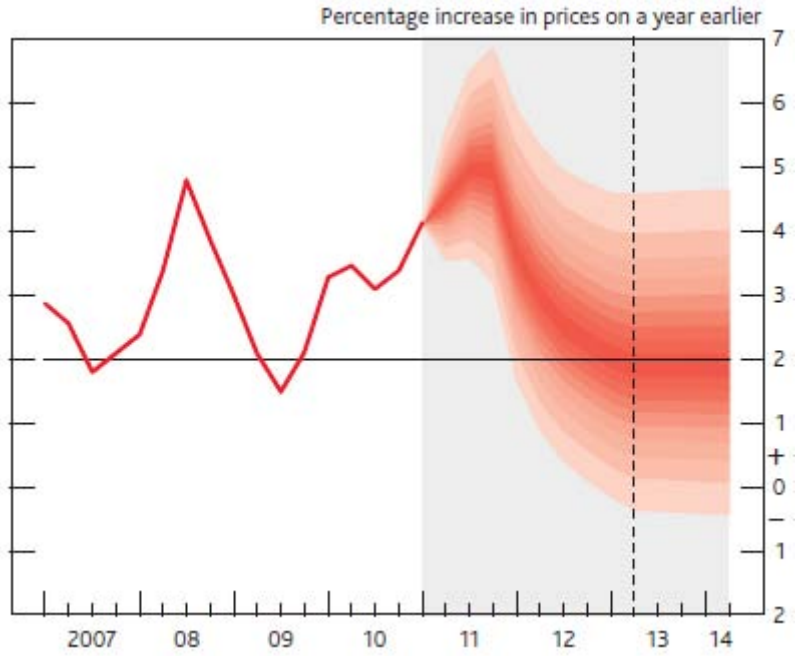


Figure 5.1: The Bank of England's May 2011 CPI Forecasts

Source: Bank of England.

Table 5.2: HM Treasury's April 2011 inflation forecasts

	Percentage change on a year earlier, unless otherwise stated						
	Outturn	Forecast[1]					
	2009	2010	2011	2012	2013	2014	2015
Inflation							
CPI	2.2	3.3	4.2	2.5	2.0	2.0	2.0
RPI	-0.5	4.6	5.1	3.6	3.5	3.6	3.8
Terms of trade[5]	-0.9	-0.3	-2.6	-1.0	-0.2	-0.1	0.0
GDP deflator at market prices	1.5	3.0	3.0	2.4	2.7	2.7	2.7

Source: HM Treasury.

As always with these forecasts, CPI-measured inflation is assumed to come 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 due mainly to upward pressure that has been placed on prices in shops by the January 2011 increase in VAT and the depreciation of sterling over the past 2-3 years.

The most interesting part of the numbers is the forecast of RPI-measured inflation that sits alongside the CPI numbers. In 2011 and 2012 RPI moves higher due to the same factors that are lifting CPI-measured inflation. Thereafter, a wedge of between 1.5 and 2 percentage points 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 1.2 percentage points going forward.

The OBR explains in its April 2011 that the latter of these two effects is partly a statistical phenomenon caused by the different CPI and RPI methods for aggregating prices into an index and partly by expectations that house prices (which are picked up by RPI abut not CPI) will track average earnings growth in future. Taken together the two things mean that a 2% CPI inflation target is now best thought of as converting to a 3.2% RPI-measured inflation rate. This 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).

Table 5.3: RPI forecasts

	RPI-measured inflation
2011/12	5.2%
2012/13	3.4%
2013/14	3.5%
2014/15	3.6%
2015/16	3.8%
2016/17 and thereafter	3.2%

5. Conclusions and Interpretation

Table 5.1 combines the numbers in sections 3 and 4 into overall calculations of RPEs.

Table 5.1: First Economics' RPE estimates

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17 to 2020/21
Labour – general	(3.2)	(0.9)	0.6	0.8	0.7	1.05
Labour – specialist	(1.95)	0.35	1.85	2.05	1.95	2.3
Materials – general/civils	(0.7)	1.1	1.0	0.9	0.7	1.3
Materials – electrical	(0.2)	1.6	1.5	1.4	1.2	1.8
Materials – steel for pipelines	14.8	1.6	1.5	1.4	1.2	1.8
Plant and equipment	(1.2)	0.6	0.5	0.4	0.2	0.8

The story that this table tells is slightly different from the one that we put forward in our DPCR5 reports. This is for two main reasons:

- first, we have reflected the UK's relatively slow recovery from recession in our estimates of wage inflation. The expectation for the UK economy as a whole is that workers will suffer reductions in real incomes for another two years and we need to recognise that the transmission networks will be among the firms that benefit from lower cost pressures as a result of this; and
- second, our calculations of real price effects are against a noticeably higher RPI-measured inflation rate. This is best thought of as a presentational quirk in that the nominal figures in the latter half of the ten-year forecast period are broadly the same as the ones that we gave to the electricity DNOs, hence our view of the real-life cost pressures that the transmission networks will face over the medium to long term has not changed. What is different is our estimate of the amount of cost increase that companies and Ofgem need to capture in RPEs and the amount of cost increase that the networks will be compensated for naturally via the indexation of price controls in line with RPI.

The second of these points highlights something that First Economics has written about in numerous papers over the last six years – i.e. when measuring real input price inflation, one has to pay as much attention to the benchmark against which real is being measured as to the actual price increases that firms are facing.

Annex 1: Forecasting in nominal terms versus forecasting in real terms

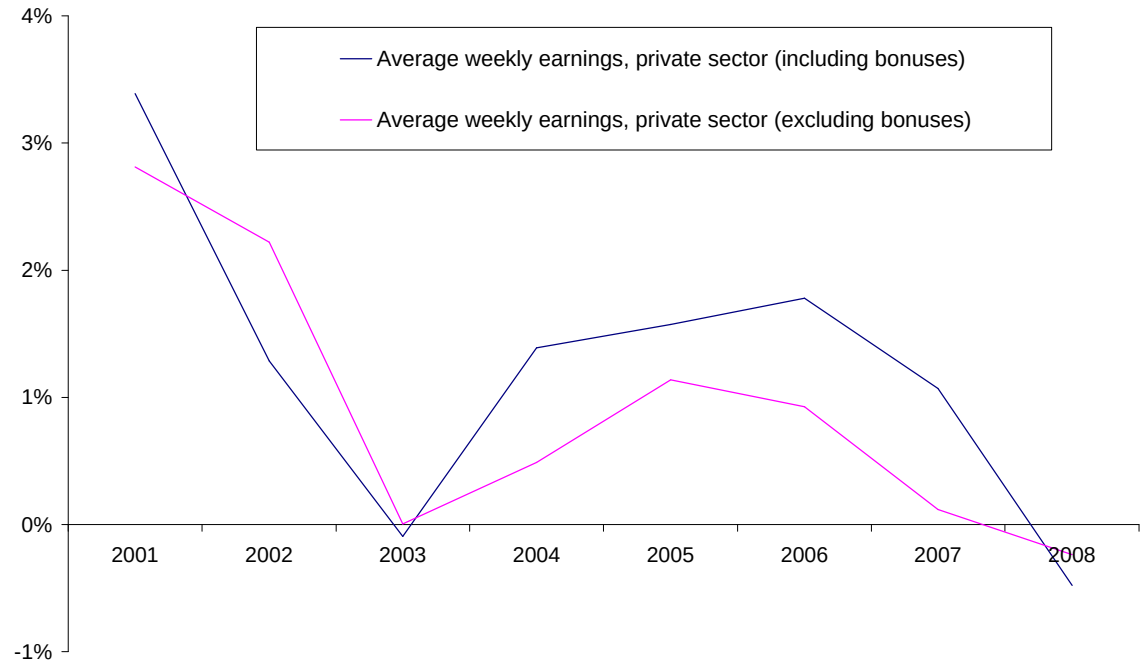
In section 2 we explained that forecasts of real input price inflation are best obtained from separate estimates of nominal input price inflation and RPI-measured inflation rather than more direct, one-step estimates of real price increases.

Figures A1 and A2 help to illustrate the point we were making.

Figure A1: Nominal wage inflation

Source: ONS.

Figure A2: Real wage inflation



Source: ONS.

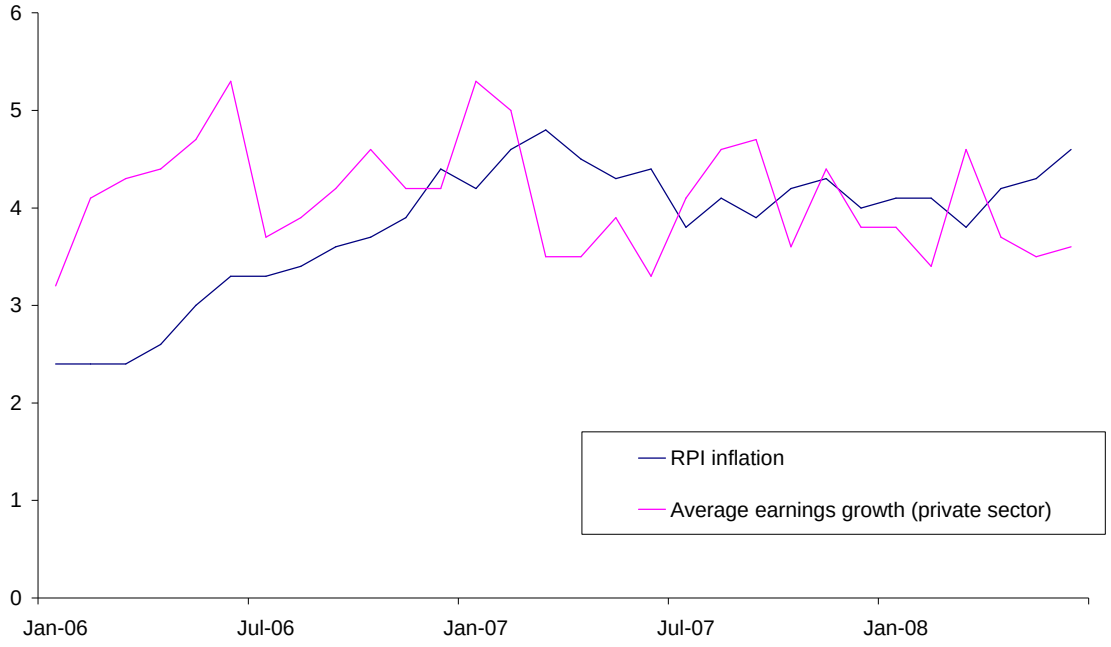
The charts depict the same wage increases, but with figure A1 presented in nominal terms and figure A2 presented in real terms. It can be seen straight away that the data in figure A1 is far more stable than the data in figure A2.

As we explained in section 4, the conclusion that we think should be drawn from the charts is that UK wage inflation is approximately 4.25% per annum in normal economic conditions. This is not just the average rate of nominal wage inflation over the period considered; it is also an accurate proxy – to within 1.5 percentage point – of nominal wage inflation in every year covered by the chart (a period deliberately chosen to exclude the abnormal economic conditions of 2009 and 2010).

This is not a mere quirk or coincidence. In an era of inflation targeting the demands that workers make of their employer tend not to be unduly influenced by the prevailing rate of inflation. Wage increases are anchored instead to forward-looking inflation expectations. In practical terms, this means that workers will be happy with a 4.25% pay increase even as inflation creeps up to, say, 5% provided that they believe the Bank of England is capable of meeting its inflation target over the long term. In such a situation, it is only if the emergence of 5% inflation translates into permanently higher inflation expectations on the part of workers that pay demands will creep up beyond the normal 4.25%.

Figure A3 illustrates this point with a real-life example. The chart shows a gradual increase in inflation during 2006 and 2007 to a peak of 4.5% in April 2007 and readings of 4% or thereabouts in the subsequent 12-month period. Throughout this time it can be seen that wage inflation was restrained, with workers at some points accepting an erosion in pay in real terms. (NB: this was a period of strong economic growth and historically low unemployment; this was not a time when the threat of recession was in the minds of most individuals.)

Figure A3: Average earnings growth and inflation, 2006 to 2008



Source: ONS.

Bank of England Inflation Reports from this period repeatedly emphasised the importance of containing inflation expectations. Had wages responded to abnormally high RPI-measured inflation, the UK economy would have suffered a 1970s style wage-price spiral, However, because the Bank was successful in keeping inflation expectations in check, the feared wage pressures never materialised and the Bank was able to step back from the corrective action it would otherwise have had to take.

It follows from this analysis that the correct way to forecast future real wage inflation is to deduct forecast RPIX-measured inflation from an estimate of nominal wage growth. If, therefore, one considers it likely that wage inflation in the medium- to long-term will match pre-recession wage increases, one needs to allow for nominal wage inflation of 4.25% per annum and not any particular level of real wage inflation of 1.25% per annum.

Among other things, this means that an increase in RPI-measured inflation due to the factors listed in section 5 of the main paper should lead to a lower rate of real wage inflation in steady state.