



Annex A22.02

RPE and ongoing efficiency

December 2019

As a part of the NGGT Business Plan Submission

nationalgrid

Introduction and overview

We have benchmarked and market tested our costs at the start of the T2 period as shown in the Efficient and affordable chapter of our plan which evidences that our costs will be efficient as we enter the T2 period. Costs will then vary due to changes in the volume of work we undertake and variations in the input price of individual activities. The main chapters of our plan explain how we see volume of work changing in the T2 period. This annex sets out how the input prices which underpin our costs might vary over the T2 period; termed frontier shift by Ofgem.

There are two elements of frontier shift:

- **Productivity improvements (on-going efficiency)** which will materialise throughout the price control period and enable the same workload to be delivered for less; and
- **Real Price Effects (RPEs)**, which are defined as price inflation not captured by the general inflation index which is the Consumer Price Index Housing (CPIH) in T2.

It is the net impact of these two factors which represent the projected frontier shift of costs i.e. how prices will move in the period. This annex includes our evidence and forecasts for these two factors of the frontier shift and how they should be treated in the T2 framework.

At a summary level, we provide evidence for the following:

- Why including opex productivity improvements of 1.1% per annum and capex efficiencies of 4% in the T2 period are above historical trends and future forecasts;
- Why the RPE impact on our plan will be material, is not captured in CPIH forecasts and requires additional revenue in the period;
- Why we believe we are best placed to manage the risk of labour RPE so are proposing fixed allowances for this category but recognise this gives rise to forecasting risk; and

- Why we are proposing an indexation approach for more volatile material RPEs where we have less control around the price drivers.

As a result of this:

- For labour costs, we expect costs to rise above CPIH by 1.3% per annum, lower than historical trends and consistent with Office for Budget Responsibility (OBR) forecasts;
- We propose to treat this as a fixed allowance in the period, but this assumption should generate a productivity improvement of 1.1% per annum;
- For capex material costs, we also forecast an increase over CPIH, initially forecast as 2.5% per annum but we propose this would vary based on actual movement in indices;
- Opex costs for the same activity volume are expected to reduce by £26m from the start of the T2 period with reference to RPI or stay broadly flat with reference to CPIH;
- Including both RPEs and efficiency, capex costs are forecast to reduce by £8m with reference to RPI, increasing by £180m with reference to CPIH mainly due to material cost RPEs which are subject to indexation.

Productivity improvements (on-going efficiency)

Headlines

- Our plan gives evidence for why our costs are efficient as we enter the T2 period and where we have embedded catch up efficiency to bring costs in line with benchmarks;
- On top of this, we have included a 1.1% per annum opex productivity challenge and 4% capex efficiencies which we do not know how we are going to deliver at this stage;
- These embed £31m of savings into our opex forecasts and £57m into our capex plan;
- We have based the opex productivity assumption on long term productivity indices and industry comparators, using the top end of long-term trends to set an ambitious target;
- As a result, the 1.1% per annum figure is nearly three times the forecast from the Bank of England for UK productivity over the next four years.

Types of efficiency

Economic theory and empirical studies set out different elements of efficiency, depending on what is being measured and where the starting point lies. The more rounded studies focus on both cost efficiency and ability to deliver outputs i.e. efficiency and effectiveness. This approach balances the risk of cutting costs too far in an attempt to get more cost efficient but in doing so undermining customer service by becoming less effective. We focus in this section on cost efficiency but in doing so we do not ignore the risk of impacting effectiveness. When we talk about productivity improvements, we mean how we can deliver the same activity for less. We do not include the impact of whether more, less or different activities are required to deliver customer outputs. These aspects are covered elsewhere in our business plan.

The starting point of any efficiency assessment is whether costs are in line with benchmarks today or not. From this assessment, there are three types of efficiency that could be applied in regulatory forecasts to ensure costs are efficient and remain there through:

- **Catch up efficiency:** if costs are lagging behind benchmarks at the start of the price control period then “catch up” efficiency should be assumed to close the gap. This gap could be closed over a period of time or immediately;
- **Productivity improvement (on-going efficiency):** benchmarks are expected to improve over time as everyone strives to deliver better performance and delivers productivity improvements;
- **Step change efficiency:** if there are specific reasons that the next price control period will be different to periods used to calculate on-going efficiency assumptions (e.g. new technology benefits) then there may be reason to include a step change efficiency into the forecasts.

Catch up efficiency

Within our business plan, and in particular the Value for money chapter, we include results from benchmarking and other cost assessments for the elements of our costs as we enter the T2 period. This includes comparison to historical cost levels which set the expectation for the cost of delivering current activities where external benchmarks are not readily available.

Benchmarking and market testing evidence shows that our costs are efficient at the start of the T2 period:

- For opex costs, we have included £30m per annum of savings ahead of T2 from our recent reorganisation (“PEx value”) which used a zero-based budget approach to minimise the costs of delivering customer outputs. As a result, opex at the start of the T2 period is lower than any point over the last ten years and below regulatory allowances for the first time in the T1 period. More specifically, we have benchmarked our 2020/21 business support costs and included additional savings (catch up efficiency) of £8m where costs are higher than benchmarks. For these reasons, the expectation is that opex efficiencies in the T2 period will relate only to productivity improvement rather than any further catch up efficiency.
- For capex, we have market tested all capex during the T1 period. We have embedded the savings from T1 cost and delivery approach improvement into our T2 plan and continue to use market testing to set the forecast unit costs. During the period we have been subject to high incentivisation to reduce costs and bring them to the efficient frontier, including the first period which included equalised incentives on capex and opex. This means we are assuming any T2 period capex efficiencies will only relate to productivity improvements or step change efficiency.

Productivity improvements (on-going efficiency)

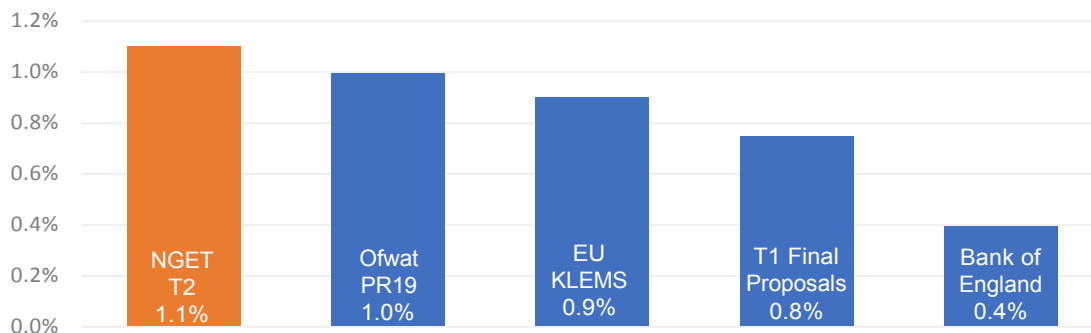
Input prices will change with increased productivity as companies find ways of delivering the same activities for less. This will happen for even the most efficient companies in any benchmark. The role of embedding productivity improvements into regulatory allowances is to ensure that costs stay at the efficient frontier in the future.

We have embedded productivity improvement of 1.1% per annum into our plan for labour elements and other non-labour opex costs. In coming to our forecast, we have assessed a range of data sources as well as looking to regulatory precedent for supporting evidence. We have then included a figure above the top end of the evidence to give ourselves a further challenge.

Predicting the level of future productivity is particularly challenging in the current economic climate and the levels of uncertainty which are resulting in a large range of estimates. Following the global economic crisis in 2008 there has been a marked slowdown in productivity across many industries which has failed to return to levels seen pre-recession. This is reflected in UK wide measures, such as Bank of England forecasts as well as the downturn in productivity signalled by the Office of Budget Responsibility.

In reviewing the data, we have been cognisant that we are creating forecasts for the period 2021 to 2026, 15 months from the point we submit our business plan. Shorter term forecasts tend to be more accurate by design but may not be as useful in predicting productivity for the T2 period. For these reasons, and to link to our RPE assumptions (see later in this annex) we put more weight on longer term trends and forecasts which should be good predictors for future forecasts. We recognise they do incorporate an element of forecasting risk across a five-year period.

Figure 1: Our ongoing efficiency forecasts versus long term averages.



*Additional 0.5% uplift has been applied by Ofwat for the move to totex and outcomes regulation for PR19

* T1 Final proposals weighted average of opex and capex productivity final proposals

In comparison to the figures above, our productivity target at 1.1% per annum is higher than regulatory precedent, industry data from EU KLEMS and the Bank of England. Based on the approach set out by Ofgem of using EU KLEMS data we could have embedded 0.9% per annum but we have given ourselves an additional challenge in going higher than this figure.

Ofwat PR19:

Ofwat's recent price control determinations have factored in a 1% productivity assumption for water companies as well as an additional 0.5% for efficiencies anticipated for moving to a totex and outcomes focussed deal. The additional 0.5% figure is related to a step change or catch up efficiency which we assess in the next section of this document. The 1% productivity assumption is mainly derived from Europe Economics' analysis which suggest a range of 0.6 to 1.2% per annum. This range and the 1% figure are in line the regulatory precedent for productivity from previous RIIO price controls, RPI-X energy controls and water price controls.

Although this is a valid comparator for us to consider, it is not a final figure yet and there have been challenges raised by other economic experts as to whether this is the right figure to use in the current economic climate. There are two items we note here, but others are covered in PR19 documentation:

- **Mix of industries used in analysis:** the productivity analysis is based on a subset of industries which have been chosen by Europe Economics, with the upper bound based on the most strongly performing sectors. Moving to an average of a broader range of comparator sectors would reduce the upper bound and arguably be more comparable to water (or in our case energy). The response from Europe Economics on this point is that historical performance shows many sectors can perform more strongly than the average. It is true some sectors can outperform but by the definition of average, sectors can also perform worse. This means the average of a reasonable comparator set of companies should be used to benchmark productivity rather than a cherry-picked set. Our reading of the Europe Economics and PR19 work is that the top end of the range (i.e. the 1.2%) would reduce to around 1% by doing this.
- **Absence of reference to broader slowdown:** recent data and future forecasts recognise that there has been a slow-down in UK productivity since 2008. This does not seem to be reflected in the PR19 assumptions where it is considered that comparator companies have exhibited stronger productivity performance than the UK as a whole. There are two potential issues with this analysis. Firstly, other sources of information should be used to assess the credibility of this assumption. We have used EU KLEMS and OBR data to do this. Secondly, that 2008 and 2009 data seems to have been removed from the Europe Economics analysis to "prevent downward bias in the estimates". There is no definitive reason for why the T2 period could not be impacted by the same downturn seen in this two-year period, so the removal is at risk of cherry-picking data. From an energy perspective, it is worth noting that in setting the Total Market Return (TMR) estimates which use historical averages, these years (which show lower market returns) have not been excluded from the average so to do differently in productivity would be inconsistent.

EU KLEMS

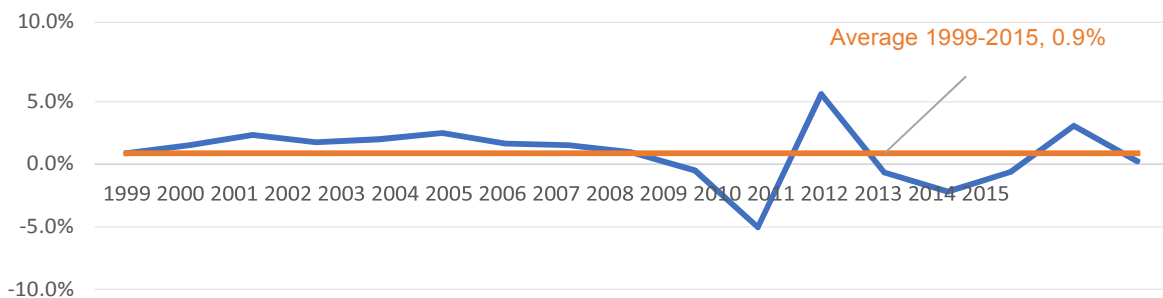
Ofgem has indicated it will use EU Capital (K), Labour (L), Energy (E), Materials (M) and Services (S) (EU KLEMS) productivity data¹ for the UK to assess ongoing productivity. This database has been used previously in other regulatory reviews and it includes data for a number of industry sectors including electricity, gas and water supply.

¹ <http://www.euklems.net/>

There are several long-term averages for productivity levels that can be taken from the EU KLEMS dataset. The approach we have taken looks at comparable industries from 1999 – 2016² which avoids distortion from post privatisation productivity and captures a period long enough after the 2008 recession to show the enduring impact on productivity in the UK.

The EU KLEMS data does not include a direct comparator for NGG, so data has been selected based on a mix of activities carried out by similar industries that are broadly representative of the activities undertaken by NGG. These are: manufacturing, machinery & equipment, electricity gas & water supply, construction, chemicals, transportation & storage, maintenance of motor vehicles and professional, scientific, technical administrative and support service activities.

Figure 2: EU KLEMS total factor productivity (TFP) growth across 8 similar industries, shows an average of 0.87% productivity over the period:



It is worth noting that we have taken a long-term average from the data, rather than a shorter-term average which would be more impacted by the negative productivity in the period 2011 to 2013. If we were to choose, for example, the five-year period from 2011 to 2016 (the most recent period) the average would be -0.2% per annum rather than 0.9% per annum which we are quoting. As noted above, we choose the longer-term period as this links to our approach for RPEs and there is an inherent link between productivity and labour RPE in particular.

Bank of England & Office of Budgetary Review

Whilst EU KLEMS provides a method for assessing broadly comparative industries productivity trends since 1999, it is also important to understand the UK wide productivity story through more generic data sources. Specifically, the Bank of England and OBR have reduced their short-term forecasts.

There are several reasons for stalled productivity since the financial crisis explored in a First Economics report for the ENA³, but specifically these include low business investment due to firms becoming more cautious when investing in new capital, the impact of monetary policy and fundamental slowing down of human technology. Although a UK wide measure does not reflect the nature of the NGG business as closely as the comparator industries in the EU KLEMS data, NGG will not be immune from the wider economic trends reflected in the Bank of England data as well as the impact on suppliers and contractors.

² Data is not yet available for later time periods.

³ First Economics – Frontier Productivity Growth, A report prepared for the Energy Networks Association

The data below shows the estimates from the Bank of England for annual total factor (TFP) productivity growth. The long-term average over the period shows 0.39%, with the forecast for the start of T2 at only 0.3%:

	1998-07	2008-10	2011-14	2015-18Q3	2018Q4-22Q1
TFP growth	1.0%	-0.6%	-0.1%	0.2%	0.3%

Given the broad range in future productivity there is a risk around following regulatory precedent without considering the broader UK evidence as seen from the Bank of England data. However, we are committed to embedding an ambitious commitment to deliver efficiencies throughout T2.

Based on the above evidence a 1.1% efficiency commitment has been embedded into our internal workforce costs (including capitalised salaries) and other operating activities. We do not yet know how we will deliver this productivity improvement, but we will seek to use various measures including continued efficiencies from competitive tendering and employing continued best practice from the performance excellence frameworks.

In total when coupled with our PEx value savings, this assumption means our underlying opex cost base will reduce by 12% between 2018 and the end of the T2 period. Over the seven-year period this is the equivalent of a 1.6% per annum productivity improvement.

Step change efficiency

We are committing to a total of 4% efficiency across the capital cost of our draft business plan, including the 1.1% per annum productivity on labour, which will keep us efficient throughout RIIO-2 for the benefit of energy consumers. We will achieve this through rigorous use of our investment process to ensure efficiency through the lifecycle of our projects and by extracting value from the supply chain with our contracting strategy. We are going further in capex because we are undertaking a programme which will improve the efficiency of our project management and data understanding.

In committing to this, we are incorporating step change efficiency into our forecasts which is above the general productivity assumptions and above levels delivered during the T1 period.

In addition to this, we also need to assess whether T2 is a period where there is expected to be a step change in efficiency for the energy sector as a whole through potential benefits from industry trends such as digitalisation should increase our productivity assumptions for T2.

Our conclusion was that this should not be reasons to include additional step change efficiency into our plan. This can be explained using three main reasons:

- **Long term data sets include historical step change efficiency:** we have purposefully used long-term data sets as our reference points to forecast our productivity improvements. This data will include historical efficiency step changes from past trends such as outsourcing of IT and use of shared services models. This means that step changes in efficiency and prior performance are already reflected in the ongoing efficiency assumptions embedded in our plans. There is an alternative approach of using shorter time periods for on-going efficiency assumptions and including a step change

expectation but this would reduce the 1.1% per annum figure we have included given the recent data in EU KLEMS.

- **Use of productivity improvement towards top of range:** we have used productivity figures at the top of or above comparator ranges in our business plan. We have done this to reflect the potential impact of digitalisation and as a result we are pushing for productivity levels 0.8% per annum higher than the economy wide forecast.
- **Inclusion of step change capex efficiency:** as noted above, we have already included additional step change efficiency into our plan. This does not relate specifically to digitalisation but we do not know how we will deliver this entirely. Some benefit could come from data manipulation and digital improvements. Inclusion of additional savings due to digitalisation could therefore double count the benefit.

From a more principle-based perspective, additional step changes on top of on-going or catch up efficiency should not be baked into productivity assumptions unless they are certain. This was considered as part of the RIIO-ED1 Competition and Markets Authority (CMA) appeal where potential savings from the introduction of smart grids were removed from future allowances as they were not certain.

Real price effects

Headlines

- Real price effects have a material impact on the costs we incur with 76% of our totex plan impacted by price changes that show sustained deviation from CPIH;
- Networks cannot avoid the impact of price rises however for labour costs we can manage their impact over the short-term to some degree;
- We support the RPEs for materials being trued up to actual outturn figures through use of indexation as networks have little to no ability to manage these impacts;
- We propose a fixed allowance for labour costs is more appropriate as costs are less volatile and more controllable, although we recognise this introduces forecast risk;
- Using long-term historical data and forward-looking indices we include the following RPEs in our plan compared to CPIH⁴:
 - For labour costs, we expect costs to rise above CPIH by 1.3% per annum, lower than historical trends and consistent with OBR forecasts;
 - For material costs, we forecast an increase over CPIH, initially forecast as 2.5% per annum but we propose this would vary based on actual movement in indices;

⁴ For T2 the figures quoted here will be on average 1% per annum higher than they would have been for T1 due to the change in inflation base for T2, which has moved from the Retail Price Index (RPI) to Consumer Price Index Housing (CPIH)

Materiality of RPEs in T2

In T2 we will be protected from unanticipated input price inflation using CPIH. This ensures that our revenue allowances move in line with generic cost increases and decreases across the price control period. However, the price of the goods and services we procure, tend to move differently to the basket of consumer goods which make up general inflation measures such as RPI and CPIH resulting in a real price effect. This is particularly the case for construction materials and specialised labour.

In assessing whether the movement in prices of these items should be reflected in the revenue allowances above CPIH, we first need to understand the answers to two questions:

- what proportion of our plan is impacted by each driver; and
- whether this proportion is different to the basket of goods used to calculate CPIH.

We have cut our cost base into the categories of spend which are aligned to above inflation price increases that we have discussed above. We have used subject matter experts within the business to define these proportions across different spend areas of our plan. The capital spend in our plan is broadly split between labour and materials with some equipment costs. Specialist projects which we outsource to third parties have been classified as other. Most of our opex spend is driven by labour costs other than an element for contracted out services such as facilities management.

Table 1: Proportion of plan impacted by RPEs:

	Opex	Capex	Totex
Labour	67%	36%	46%
Materials	3%	34%	25%
Plant and equipment	-	7%	5%
Sub-total	70%	77%	76%
Other	30%	23%	24%
Total	100%	100%	100%

It can be seen from the above that the labour, plant and equipment and materials proportions of our plan total 76% of our plan. The basket of goods for CPIH on the other hand does not include any items equivalent to these categories, with the exception that labour costs would form part of the retail goods included. This means that any price changes in these items would have a more pronounced impact on our overall plan than the elements in CPIH.

Price changes compared to CPIH

Indices which track specific commodities or labour types can provide evidence for how costs have varied compared to CPIH and provide forecasts on how costs may differ in the future. There are different indices which can be used for this, and different historical time periods which can be used.

In terms of indices, we use the indices applied in the RIIO-T1 allowances as we have not found any better indices which can apply to our cost base. These indices are composite in nature,

meaning they include the combination of several indices for labour and focus on built equipment (e.g. steel pipeline) rather than raw commodities (e.g. copper or steel) for materials. There is an argument that our underlying materials costs move in line with those of raw commodities rather than a copper pipeline index (as our equipment is not just copper pipeline) however we recognise the benefit of using an equipment index which incorporates both the price changes from the raw materials and the costs of manufacture. The consequence of using an equipment index rather than raw commodity indices is that the index includes the impact of productivity improvements from the manufacturer. This means any cost increases or decreases from these indices are the net of RPEs and productivity (i.e. they are already showing frontier shift).

From a time period perspective, analysis shows that - like the productivity data - there is currently differentiation between long term and short-term trends. This seems to partly be due to volatility in short term prices due to the economic environment. For forecasting the impact of input price changes in T2 we have used a long run business cycle, this is preferred to the most recent shorter business economic cycle as a significant percentage of the latter includes the effect of the financial crisis. This approach is also consistent with our approach to productivity and recognises the link between price changes and productivity, particularly for labour.

The table below shows the price movements for the most recent long economic business cycle (1997 to 2014) and short business cycle (2002 to 2010).

Table 2: RPE forecasts compared to CPIH over two different business cycle periods:

RPEs relative to CPIH	Long business cycle (1997-2014)	Short business cycle (2002-2010)
Composite labour	1.3%	2.0%
Composite equipment	0.3%	0.9%
Materials CAPEX	2.5%	6.9%
Materials OPEX	2.9%	5.0%
	Selected for business plan	

Labour – Forecast 1.3% increase to CPIH (0.3% increase to RPI)

The composite labour index used by Ofgem in T1 is made up of the following indices:

- Annual Weekly Earnings (AWE) private sector from the Office of National Statistics (ONS)
- AWE construction
- AWE transport and storage
- PAFI civil engineering labour indices
- BEAMA electrical engineering indices

The composite index has shown increased volatility in the short term as shown by the graphs below but it can be seen there is a sustained difference to both CPI(H) and RPI:



Whilst these graphs show the price movements for the broader economy, we also need to consider how our own labour costs have moved in the T1 period.

Benchmarking evidence shows that we pay at the market median rate so our labour cost is in line with that of our peers and it is essential it remains that way for retaining skilled staff within a competitive industry. Over T1, our pay growth has tracked above both CPIH and slightly above RPI inflation. We expect this trend to continue over the T2 period.

To manage the labour RPE risk we took the action to lock in an RPI linked deal at the start of the T1 period following extended negotiations with trade unions. We have therefore not seen the down turn in wage growth between 2014 and 2017 as shown in the indices. These longer-term pay deals are good practice in regulated industries as they avoid price fluctuation for customers. Although broader labour indices have recently trended below RPI, this mitigating action would have protected consumers in the event of labour price rises which, given the nature of the economy at the time could easily have occurred. It also demonstrates our ability to manage this risk over the shorter term and that there may be some cost involved in doing so. This approach has not caused our costs to vary from the efficient level as shown by our pay still benchmarking in line with market median.

Materials, Equipment & Plant

	Variation to CPIH
Equipment & plant	0.3%
Materials CAPEX	2.5%
Materials OPEX	2.9%

There are three distinct areas of materials, equipment and plant, for which different indices were used by Ofgem in the T1 allowances:

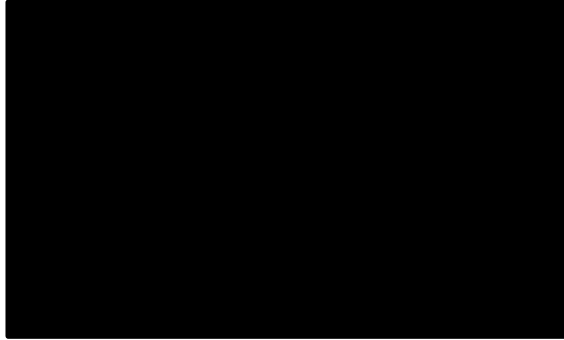
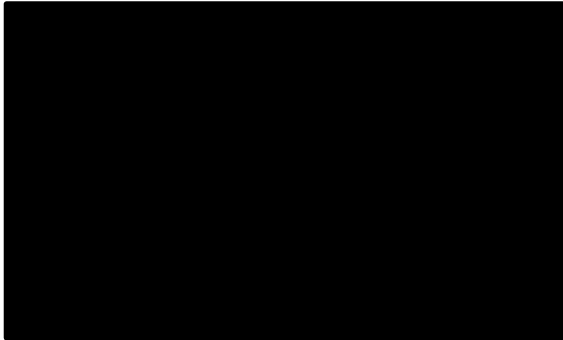
- Equipment and plant – composite equipment index
- Materials capex – PAFI structural steelwork index
- Material opex – FOCUS infrastructure index

According to these indices, the historical long-run trend in input prices and inflation has not remained steady since the 2007/08 financial crisis, as can be seen from the charts below. However, it is evident that input price growth has always been distinct from inflation growth whether measured by RPI or CPIH. Since the financial crisis, there has been a marked increase in volatility in growth rates of the indices and inflation. The materials indices seem to have

consistently exhibited greater volatility relative to inflation, with the trend continuing in recent years.

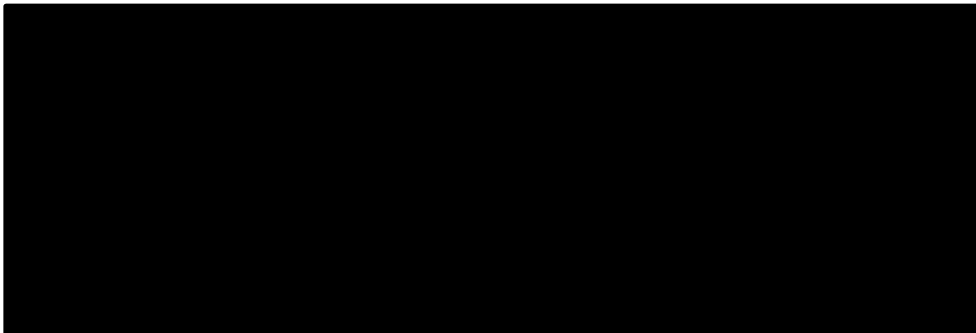
Equipment and plant

There has not been a consistent long-term relationship between the composite equipment index and RPI or CPIH. However, change in the composite equipment index has been consistently different to inflation over the long term and higher than the change in CPIH in recent years (2016 onwards):



Materials (capex)

The PAFI steelwork index (the proxy for all capex materials used by Ofgem) displays a more variable trend with distinctive spikes in certain periods when compared with RPI and CPIH. The spikes show the responsiveness of steel prices to the underlying macroeconomic conditions.



Materials (opex)

Between 2000 and 2012, the growth rate of the FOCUS resource cost infrastructure index was significantly higher than RPI, falling for a few years in between and then picking up again in 2017. On the other hand, when compared with CPIH since 2006, there seems to be no distinct pattern—FOCUS resource cost infrastructure index has grown substantially higher than CPIH in some years and lower in the others:



In our own procurement experience, commodity prices feature as a key consideration of our contract negotiation process. Where possible we endeavour to mitigate our risk to the volatility in commodity pricing through our contracting strategy. However, often our contracts will have mechanisms built in which trigger price adjustments in line with any commodity or exchange rate fluctuations that are classified as significant.

Approach for managing RPEs in the T2 framework

In T1, Ofgem gave a fixed revenue allowance for the impact of RPEs on labour and materials based on analysis of historical trends and future forecasts. This approach has come under scrutiny during the period as price rises have been lower than allowances due to economic uncertainty and lower UK growth. This has put more focus on forecasting risk for RPEs, being the risk that the actual price changes are different to allowances which could give rise to windfall gain or loss for networks or consumers.

However, the first risk that needs to be considered when assessing how to deal with RPEs in the regulatory framework is the RPE risk itself i.e. the risk of changes to CPIH. This should be considered from the RIIO principle of risk being held by the party best able to manage it.

The main driver of the RPE risk, be that related to labour or materials, is movement in the general economy. This is not controllable by networks as we are not large enough to move the general economy and therefore networks cannot avoid price rises or reductions. However, they can take actions to mitigate the risk to some degree. This could be to dampen the impacts or to reduce short term fluctuations that would otherwise lead to price variability for customers. Contracting strategy for equipment and pay strategy for labour are examples of this.

If RPE risk is held by networks, then they are more incentivised to undertake these activities because they will feel the impact of price changes. Consumers on the other hand have very limited options in managing this risk. Whilst the forecasting risk issue has been highlighted from a period where price changes have been lower than forecast, the forecasts could equally be too low in the period. If the RPE risk was fully passed through to consumers and our customers then they would not have any ability to manage the price fluctuations and their charges would vary as a result.

We have considered these implications when assessing what the right approach is for managing labour and materials during the T2 period.

The composite mix of specialist labour has a long-term relationship with inflation, trending at c.1.3% above CPIH over a long business cycle (1997-2014). However, over the short term cycle this relationship broke down as the economy struggled to recover from the financial crisis. This suggests a long-term trend but short-term uncertainty.

For the equipment we buy however, particularly commodity linked materials, there is significantly more volatility between indices and general inflation. There does not seem to be a long-term relationship, but there have been material differences to CPIH.

These relationships could mean that separate treatment is required to recognise the different levels of risk present around changing input prices.

For the specialised labour we employ, there is more that we can do to manage this risk which is inherently more controllable. Similarly, due to the unionised nature of our internal labour, the majority of this is linked to periods of pay deals which renders an element of labour costs relatively fixed. For the consumer this means that if a price movement occurs in the labour market, this is unlikely to translate to an impact on totex spend until the next price control period. An ex-ante allowance which recognises the long-term uplift to CPIH seen in specialist labour markets would appropriately fund us for the increased price pressure but leaves the risk of price fluctuation with us to manage through pay deals and negotiations with contractors.

Due to the uncertainty in the UK economy, specifically Brexit, the use of a deadband may be appropriate around the labour RPEs to protect consumers and investors against any shocks to the labour market. We do recognise that this approach leaves a forecasting risk with consumers. This seems like the right approach but we have also engaged with members of our stakeholder user group on this trade-off and they agree with us that labour costs are more controllable and understand the balance of risk between the options. They support our proposal but wanted to make sure that the forecasting risk was explicitly raised.

For materials where there can be significant volatility and RPEs can be difficult to forecast, indexation may be appropriate to adjust allowances in line with the movements in price. This protects networks from sharp increases in goods which they have little or no impact to mitigate and protects consumers in instances where forecast prices outturn lower than anticipated.

Table 2: Our proposal to manage the risks of real price effects in the T2 period

Commodity	Plant, materials & equipment	Labour
Volatility	High - particularly in materials	Lower in the long term
Mitigation by networks	Limited ability, more akin to pass through	More controllable through salaries
Risk of variance to forecast	High due to volatility	Lower risk due to length of pay deals
Proposal	Indexation	Ex-ante allowance with deadband of +/- 10%

RPE revenue allowances

Based on analysis of price indices relative to inflation over a long run business cycle, we are anticipating the below impact of real price effects on our totex plans:

Table 3: Forecast impact of RPEs over the T2 period

Impact of RPEs in T2	Indices	2022	2023	2024	2025	2026	T2
Labour	Composite mix of specialist labour and non-specialist labour	5	12	18	23	26	85
Materials, Plant & Equipment	Mix of PAFI, FOCUS & PPI indices	3	9	14	17	19	63
Total		9	21	32	40	46	148

Labour:

To manage the risk of real wage inflation above CPIH we are proposing an ex-ante allowance based on the long run average relationship between wages and inflation across a business cycle. Using a long run business cycle from 1997-2014 is more suitable than the shorter cycle (2002 – 2010) as a significant percentage of the latter includes the effect of the financial crisis and therefore is not necessarily representative of what is likely to happen in the future.

We have calculated this as 1.3% per annum relative to CPIH which relates to labour both directly employed by NGG or externally contracted, in line with Ofgem’s guidance not to distinguish between resourcing strategies.

We have also checked this 1.3% assumption against OBR forecasts for the next four years. These show the following forecasts:

OBR labour RPE ⁵	2022	2023	2024	2025	4 yr average
Labour	1.1%	1.2%	1.3%	1.4%	1.2%

The forecast is marginally below our 1.3% assumption but it does not include a 2026 forecast. If this is included at either 1.3% or 1.4% (in line with trend used) the average would be in line with our 1.3% assumption, albeit with a different phasing across the period.

We are proposing the revenue allowance for labour real price effects is not indexed to the underlying indices for the following reasons:

- Utility industry labour tracks the composite indices in the long term and not the short-term movements seen in the indices due to the pay deal process and longer-term employment;
- Labour costs are inherently more controllable by NGG and significant effort from management is employed to keep costs efficient whilst retaining skills and attracting new talent. Following the totex principle that risk should be aligned to the party best placed to manage it – labour cost risk should sit with networks;

⁵ See PR19 analysis: [Securing cost efficiency](#)

- The underlying indices are less volatile than those for materials and commodities and therefore unlikely to result in windfall losses or gains for consumers;
- With the move to a five-year price control it could be that the next pay deal will be for the duration of five years also, rendering the majority of our internal labour costs largely 'fixed'.

Given the uncertainty in the UK and global economy we recognise that shocks that may break this trend are possible over the T2 period as the impact of factors such as Brexit and US trade relations ripple through to the cost of the labour force we employ. To protect against these economic shocks, we are proposing to factor in a wide deadband (+/- 10% change) around the labour RPE allowances which would protect both consumers and investors against steep price increases or decreases over the price control period.

Materials:

Based on the long-term data set, we are proposing revenue RPE allowances of 2.5% for materials capex, 2.9% for materials opex and 0.3% for plant and equipment, all relative to CPIH. We are proposing that the allowances for these elements of the plan should be indexed to the underlying indices and updated annually for the following reasons:

- NGG has limited ability to control how input prices impact the cost base. Changes in input prices will be factored into all goods we purchase.
- The indices aligned to these costs are inherently more volatile than labour, although these can be partially mitigated, the risk cannot be controlled by NGG.

Using the T1 indices for these categories we have created a weighted forecast of costs that reflect the long-term price trends of the labour, plant and equipment that we buy. Whilst we are forecasting the above RPEs, there are a number of options for how these could be dealt with in initial allowances for T2:

- No initial allowance and reflect changes during the period through revenue adjustments;
- No allowance in the period and true up RPEs at the end of T2;
- Initial allowances based on forecast and true up to indices within the period;
- Initial allowances based on forecast and true up at the end of T2

Taking the question first of whether an initial allowance should be applied and then later true up. Leaving this out of initial charges, only for it to be applied later in the period or after the end of the period could give rise to sizeable changes in customer charges, particularly for the opex / fast money elements. Customer feedback on charges focuses on predictability and certainty of charges. For these levels, it therefore seems more appropriate to apply the allowances from the start of the period and then true them up.

This true up could happen in the period or at the end of the period. There is a simplicity in approach in trueing up allowances only at the end of the period. However, given the volatility of price changes that have been seen historically this could result in significant change at the end of the period.

On balance, we propose that allowances should apply at the start of the period and be trueed up during the period based on the outturn of indices. However, we recognise other approaches would also deliver the primary outcome being RPEs being funded in line with indices.

Determining the frontier shift

The T2 frontier shift will be defined by the net impact of changes in input prices (RPEs) and the productivity driven efficiency.

CPIH captures industry price pressures as well as productivity improvements of companies which provide general goods and services. Therefore, RPEs must be considered in line with productivity to avoid a double count of efficiency where networks must manage real price pressure as well as achieve embedded productivity improvements.

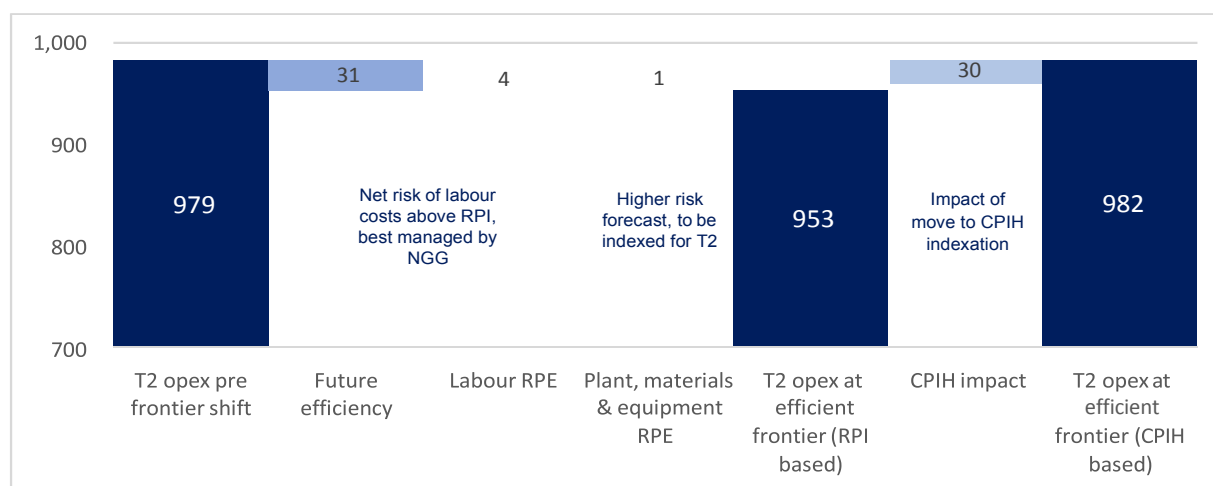
We have demonstrated in our Value for Money chapter that the costs in our T2 business plan are efficient with high cost certainty; justified through external benchmarking, market testing and internal trend analysis. Therefore, an ongoing productivity estimate representative of the industry is an appropriate efficiency target to embed in allowances to ensure allowances remain efficient throughout the price control.

Our forecast for our frontier shift in T2 is different for operational activities and our capital investment. This is because our efficiency commitment differs for spend areas as does the risk we place around the RPE forecast. It is also important to note that RPE forecasts have been adjusted to reflect the transition from RPI to CPIH to ensure the impact is net neutral, this will cause increasing RPE forecasts to appear on average 1% higher than in an RPI linked framework as in T1.

Operational frontier shift:

Based on our embedded productivity and forecasts for real price effects, we are anticipating a net reduction in the efficient frontier for opex costs both before and after the impact of the move to CPIH indexation:

Figure 1: Waterfall to show forecast impact on T2 opex costs of the frontier shift resulting in a net reduction



Note that the future productivity assumption has been applied from 2020/21 and the RPE figures apply from 2018/19 costs. In reality, a proportion of the PEx value efficiencies forecast at the end of the T1 period relate to future productivity so could be included in the graph and increase the productivity figure but we have maintained consistency to the data tables.

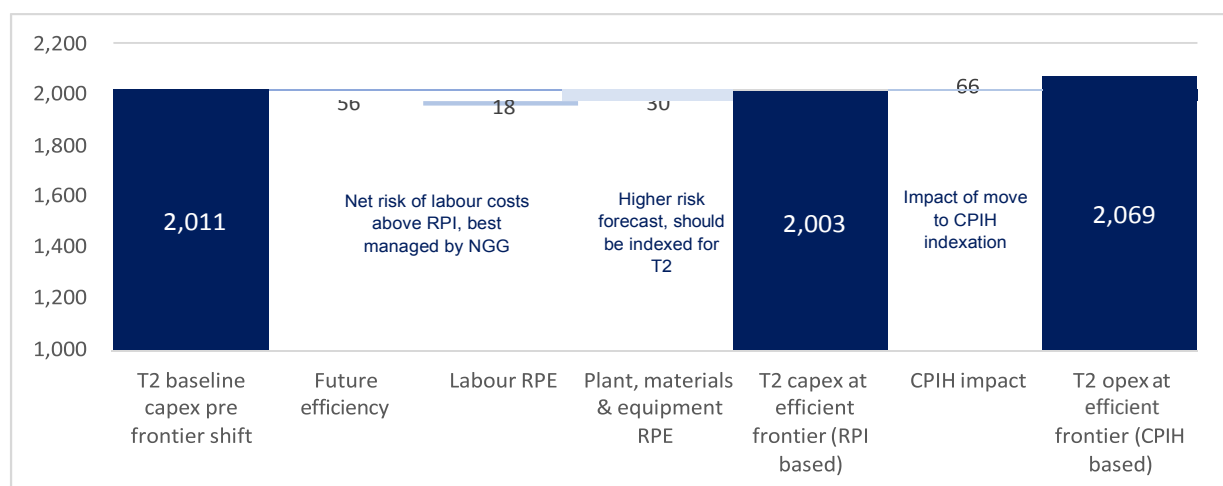
- Our on-going efficiency assumption for T2, including an additional IT productivity assumption, is baked into our October plan reducing our opex costs by £31m;
- The labour RPE increases our costs by £4m; this is a risk we should be managing on behalf of consumers;
- The remaining RPE driven by plant, materials and equipment only increases the opex costs by £1m but is a less certain forecast which we would propose to be indexed to protect consumers from the volatility seen in these indices;
- The move to CPIH indexation adds £30m to the frontier shift which would not have applied in T1. This splits as £29m for labour and £1m for equipment.

Empirical evidence suggests that in the long run economy-wide wages (if not all input prices) tend to increase in line with economy-wide productivity growth (or ongoing efficiency). For example, the International Labour Organisation (ILO) Global Wage Report in 2014/15 showed that in the UK the relationship between the real wage growth and productivity growth is close to being 1:1 over the period 1999-2013. To maintain this link, we have used long term estimates of both productivity and wage growth in our RPE and efficiency assumptions which are outlined further below.

Capital investment frontier shift:

Based on our embedded productivity and forecasts for real price effects, we are anticipating a net reduction in the efficient frontier for our capex costs, with reference to RPI. In addition, we are proposing that the forecast associated with plant, materials and equipment prices is indexed to reflect the high volatility in prices. Therefore this value is likely to change throughout the price control.

Figure 2: Waterfall to show forecast impact on T2 capex costs of the frontier shift resulting in a net increase:



- T2 efficiency, based on 4% capex cost saving, is baked into our October plan reduces our capex costs by £56m;

- The labour RPE increases costs by £18m; this is a risk we should be managing on behalf of consumers;
- The remaining RPE driven by plant, materials and equipment increases the capex costs by £30m and is a less certain forecast which we would propose to be indexed to protect consumers from the volatility seen in these indices;
- The move to CPIH indexation adds £66m to the frontier shift which would not have applied in T1. This splits as £36m for labour and £30m for materials.