



GD23 - Gas Distribution Price Control 2023-2028

Final Determination Annex E
Frontier shift
October 2022



About the Utility Regulator

Utility Regulator is the independent non-ministerial government department responsible for regulating Northern Ireland's electricity, gas, water and sewerage industries, to promote the short and long-term interests of consumers.

We are not a policy-making department of government, but we make sure that the energy and water utility industries in Northern Ireland are regulated and developed within ministerial policy as set out in our statutory duties.

We are governed by a Board of Directors and are accountable to the Northern Ireland Assembly through financial and annual reporting obligations.

We are based at Queens House in the centre of Belfast. The Chief Executive leads a management team of directors representing each of the key functional areas in the organisation: Corporate Affairs, Markets and Networks. The staff team includes economists, engineers, accountants, utility specialists, legal advisors and administration professionals.



Our mission

To protect the short- and long-term interests of consumers of electricity, gas and water.



Our vision

To ensure value and sustainability in energy and water.



Our values

- Be a best practice regulator: transparent, consistent, proportionate, accountable and targeted.
- Be professional – listening, explaining and acting with integrity.
- Be a collaborative, co-operative and learning team.
- Be motivated and empowered to make a difference.



Abstract

Frontier shift represents an amount of addition to or subtraction from determined allowances, for the NI Gas Distribution Networks (GDNs) operational and capital expenditure (opex and capex). Calculations are based on the projected rate of gas industry input costs compared to our assumptions for CPIH and productivity growth.

Audience

Industry, consumers and statutory bodies.

Consumer impact

The overall impact of our determined frontier shift across GD23, including the two prior years from base year, helps reduce NI Gas Distribution Networks (GDNs) operational expenditure compared to what would otherwise have been the case absent of frontier shift. This is due in large part to our assumed 1% growth in productivity.

The final determination has increased capex allowances. This is due to the material real price effects being experienced and evidenced in 2021 and 2022. This reflects a significant change from the draft position.



Contents

Executive Summary	1
1. Introduction	3
Changes from draft to final determination.....	3
Response to GDN consultation feedback.....	3
2. Real Price Effects	13
Background	13
Company business plan submissions.....	13
Final Determination Methodology	14
Other Issues	25
3. Productivity	28
Background	28
Company business plan submissions.....	28
Final Determination Methodology	29
Productivity Conclusions	37
4. Frontier shift conclusions	38



Executive Summary

The purpose of this report is to determine the addition to or subtraction from the amounts determined for the NI Gas Distribution Networks (GDNs) operational and capital expenditure (opex and capex) to account for frontier shift.

This calculation is based on the projected rate of gas industry input costs compared to general inflation movements, as measured by CPIH (Consumer Prices Index, including owner occupiers housing costs), and the projected rate of productivity growth. The sum of these components can be a positive or a negative difference.

$$\begin{aligned} \text{Frontier shift in real terms} &= \text{input price increase } \textit{minus} \\ &\quad \text{forecast CPIH (measured inflation) } \textit{minus} \\ &\quad \text{productivity increase} \end{aligned}$$

(NB: Taken together, nominal input costs compared to general inflation are referred to as 'real price effects' (RPEs).)

Within this report, we have adopted a methodology similar to that which we first introduced at PC13 for NI Water. This aligns closely with the Competition Commission (CC) determination for Northern Ireland Electricity at RP5 and more recent Competition and Markets Authority (CMA) decisions.

The forecast for each of the components and the resulting frontier shift to be applied to GD23 opex and capex targets are given in the tables below.

Figures in %	GD17		GD23					
	2021	2022	2023	2024	2025	2026	2027	2028
Weighted nominal input prices	6.9	7.8	4.5	2.7	2.8	3.1	3.1	3.1
CPIH	(2.5)	(8.0)	(5.6)	(2.3)	(1.1)	(2.1)	(2.1)	(2.1)
Productivity	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)
Frontier shift (annual)	CPIH +3.2	CPIH -1.2	CPIH -2.0	CPIH -0.6	CPIH +0.6	CPIH -0.1	CPIH -0.1	CPIH -0.1
Cumulative frontier shift	3.2	2.0	-0.1	-0.7	-0.1	-0.1	-0.2	-0.2

Table 1: GD23 Opex frontier shift calculations



Figures in %	GD17		GD23					
	2021	2022	2023	2024	2025	2026	2027	2028
Weighted nominal input prices	6.9	17.0	4.5	2.7	2.8	3.1	3.1	3.1
CPIH	(2.5)	(8.0)	(5.6)	(2.3)	(1.1)	(2.1)	(2.1)	(2.1)
Productivity	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)
Frontier shift (annual)	CPIH +3.2	CPIH +7.2	CPIH -2.0	CPIH -0.6	CPIH +0.6	CPIH -0.1	CPIH -0.1	CPIH -0.1
Cumulative frontier shift	3.2	10.7	8.5	7.8	8.5	8.4	8.4	8.3

Table 2: GD23 Capex frontier shift calculations

Further detail on the make-up of the frontier shift is contained in the following sections. Figures have changed materially since the draft determination as they are taking into account new information including responses to our draft determination.

1. Introduction

1.1 This annex gives further detail of our analysis and considerations around frontier shift assumptions for GD23.

1.2 Taken together, RPEs and productivity (or ongoing efficiency) when adjusted for general inflation gives the frontier shift. This can be represented as:

$$\text{Frontier shift in real terms} = \text{input price increase } \textit{minus} \\ \text{forecast CPIH (measured inflation) } \textit{minus} \\ \text{productivity increase}$$

1.3 The various components of the calculations are assessed in turn in the following sections, before drawing to final determination conclusions at the end of the paper.

Changes from draft to final determination

1.4 Methodology at draft stage is set out in Annex E¹ of the draft determination. A number of key changes have been implemented since the draft decision. In summary, these include the following:

- Figures have been updated for the latest information.
- Different sources have been used to forecast inflation.
- Some different indices have been adopted to forecast input prices based on company submissions.
- Profiling has been adopted assuming a gradual decline in input prices before the long-term average is used.
- Consideration has been given to actual capex input prices based on contractor information provided by the GDNs.

1.5 The combined impact of the changes has led to some material differences since the draft stage. This is particularly the case for the capex frontier. The impact of these changes is set out in the following chapters.

Response to GDN consultation feedback

1.6 Some material concerns were raised by the GDNs with respect to the draft frontier shift position. We have listed the key points raised and provided

¹ See [Annex E](#) of the GD23 Draft Determination.

summary responses in the table below. Where changes have been adopted, these have been noted in the response. Further detail on the issues raised is provided in the following chapters.

	GDN views and UR Responses
PNGL / NERA Comment	<p>UR treats the labour categories the same, using the OBR² wage index for both general and specialist labour, therefore not capturing the fact that specialist engineers earn wages that have historically grown differently from the rest of the economy.</p> <p>However, this approach under-estimates the growth of labour prices faced by the regulated networks, as it assumes that a network's employees are, on average, representative of the UK labour force at large. <i>[NERA Response, p ii]</i></p>
UR Response	<p>It is true that certain BCIS³ specialist labour indices have grown faster than the ONS⁴ average weekly earnings indicator for the whole economy. However, since 2000 general construction wages have actually grown at 2.9% per annum, slightly lower than the 3.0% p.a. whole economy wage growth.</p> <p>It is also the case that for the available dataset from 2011 for civil engineering labour costs (4/CE/01); wage growth has again been slightly lower than the corresponding figure for the whole economy. Therefore, we consider that a specialist labour cost adjustment is not necessary.</p>
PNGL / NERA Comment	<p>Occupations that we consider specialised and relating to engineering work contributes to 45% of the overall labour index. Of the three data series that GB GDNs labour costs are indexed to, two of them (BCIS's PAFI⁵ civil engineering and ONS's Construction Average Weekly Earnings) are specific to the types of work that GDNs carry out.</p> <p>Therefore, Ofgem recognises that GDNs labour force contains a significant contingent of specialist workers, and UR should account for that when calculating the labour RPE. <i>[NERA Response, p8-9]</i></p>
UR Response	<p>UR has considered the specialist labour indices used by Ofgem to account for construction and civil engineering labour costs. Whilst there are year-on-year variances, long-term averages suggest that these costs rise in line with or even slightly below whole economy wages. Consequently, the UR does not consider there is an immediate need to make specific specialist labour cost adjustments.</p>
PNGL / NERA Comment	<p>Specialist series tend to exhibit faster wage growth than general labour series. For example, BCIS's specialist data series Labour and Supervision (90/1) has grown at a nominal rate of 3.95 per cent on average since 1991 compared to ONS AWE private sector average growth rate of 3.53 per cent over the same period, i.e. a difference of 0.42 per cent. <i>[NERA Response, p9]</i></p>

² OBR = Office for Budget Responsibility.

³ BCIS = Building Cost Information Service.

⁴ ONS = Office for National Statistics.

⁵ PAFI = Price Adjustment Formula Indices.

UR Response	UR accepts that some of the specialist labour indices have grown faster than general wage growth in the long term. However, to focus on only some labour costs would be an asymmetric approach to the detriment of consumers. Other roles that may be pertinent to GDNs such as <i>professional, scientific & technical activities</i> or <i>advertising and market research</i> where there has been wage growth lower than the whole economy average. It would be considered asymmetric and incorrect to only consider labour costs that are above the economy average.
PNGL / NERA Comment	UR uses the economy-wide wage measure for its labour index. This is inconsistent with PNGL's status as a private sector employer, as well as Ofgem's approach in the last price control decision where short-term forecasts affected regulated companies' allowances (ED1). [NERA Response, p10]
UR Response	Since 2000, differences have been marginal and the long-term average over the past 21 years is 3.0% p.a. for both metrics. Consequently, UR does not see good reason to amend the current approach of using the OBR whole economy earnings forecasts.
PNGL / NERA Comment	UR bases its short-term labour forecasts on data from the October 2021 EFO ⁶ , the last one available at the time of its analysis and also at the time of our 2022 update. The March 2022 EFO is now available. We assume that UR will update its numbers in the Final Determination to reflect the latest available data. [NERA Response, 11]
UR Response	UR has updated the analysis using the latest detail available from the March 2022 Economic and Fiscal Outlook. More up-to-date inflation forecasts from Treasury (HMT) and the Bank of England (BoE) have also been utilised. Moreover, other materials and equipment indices have been updated for the most recent data publications.
PNGL / NERA Comment	UR excluded observations from 2015 onwards [for FOCOS ⁷ and NOCOS ⁸], claiming that this series is only available up to 2014. This is not accurate: the FOCOS and NOCOS series were transferred to BCIS, where they continue to be published. [NERA Response, p12]
UR Response	The GDN is correct in pointing out this error. These indices have been updated to the latest available year (2021) accordingly.
PNGL / NERA Comment	UR's plastics series has only existed since 2010, which is a very short window to establish a long-term trend. By contrast, our recommended plastics series has existed since 1991. Our recommended plastics series has a long-term average growth rate of 3.51% compared to 2.92% for UR's preferred plastics series. [NERA Response, p13]
UR Response	The plastics series used by the UR at draft determination stage (4/CE/24) is the same as that used by Ofgem. UR recognises that either index could be used but that a longer time trend is generally preferable. Consequently, the final determination has adopted the <i>Pipes & Accessories: Plastics (3/57)</i> index as suggested by the DNO. This index has a higher long-term average than the original series. However, this impact is somewhat offset by lower price increases experienced in 2021 and forecast for 2022. UR has used both indices and averaged results to get the plastic materials cost impact. This represents a change from the draft determination.
PNGL / NERA Comment	We do not use the <i>BCIS PAFI Structural Steelwork Materials: Civil Engineering Work</i> series due to its relatively high volatility compared to other candidate series. However, the coverage and relevance of the series to PNGL's costs is more important than the volatility, so the choice between the two series should depend principally on which is more closely tied to PNGL's actual costs. [NERA Response, p13]

⁶ EFO = Economic and Fiscal Outlook.

⁷ FOCOS = Resource Cost Index of Infrastructure.

⁸ NOCOS = Resource Cost Index of Building Non-Housing.

UR Response	The structural steelwork materials index used at draft stage aligns with that used by Ofgem. However, UR investigated the volatility issue and agrees that structural steelwork is clearly more volatile. Given these issues, UR is inclined to accept the GDN index for the final determination. As with plastics, the original series has also been retained and an average used.
PNGL / NERA Comment	Both UR and NERA assume that <i>Transport</i> and <i>Other</i> RPEs follow inflation. However, in order to ensure that the switch from RPI to CPIH inflation is revenue neutral, these should be set to track RPI inflation in expectation. Therefore, we have calculated an RPE for these items equal to the long-term wedge between RPI and CPIH. UR should do the same. [NERA Response, p14]
UR Response	By using a long-term wedge as the GDN has suggested, this assumes that these costs will always rise faster than CPIH and a real price effect exists. However, this is not known with any certainty. In the absence of this evidence, it would seem reasonable to predict costs in line with the prevailing inflation factor so that neither the GDN nor the consumer takes unnecessary risk.
PNGL / NERA Comment	Even as the OBR forecasts very high CPIH growth in 2022 and (to a lesser extent) 2023, UR assumes that the nominal price indices will grow at their long-term average rate, suggesting negative growth in real terms. UR's approach ignores the fact that materials prices are very likely to grow rather than shrink in real terms in 2022. [NERA Response, p15]
UR Response	Within the final methodology, UR has used the 2021 outturn data and the 2022 provisional data to account for the large increases in material and equipment costs. Specific adjustment has also been made to capital costs based on changes to actual observed contractor rates in 2022. This has resulted in a material increase to the capex RPE for 2022 and the cumulative allowances.
PNGL / NERA Comment	By using an approach that explicitly considers recent and expected price volatility for materials and P&E ⁹ indices, we estimate a real input price increase of 1.5% per annum on average over the 2021-28 period, before the application of an OE target. By comparison, UR's approach implies a real input price increase of 0.8% per annum over the same period. [NERA Response, p15]
UR Response	UR has used an approach that accounts for the recent price volatility. Furthermore, these large increases are now captured in long-term averages used to predict future costs. This would seem like a reasonable approach. In spite of the recent input price rises, large opex RPEs would not necessarily be expected. This is due to the material increases forecast for general inflation and the fact that wages tend to lag behind, at least for a period. Given that labour costs are the largest individual component of GDN costs, it would not be unreasonable to expect low RPE impacts in the short-term.
PNGL / NERA Comment	Input price inflation for our selected Materials and P&E indices has been extremely high in 2021, all above the rate of general inflation and almost all above the long-term average growth rate. This is particularly evident for the FOCOS series where the yearly growth rate in 2021 was more than four times larger than the historical average and seven times higher than CPIH inflation. [NERA Response, p15]

⁹ P&E = Plant and Equipment.

UR Response	Within the final methodology, UR has built in the 2021 outturn data and the 2022 provisional data to account for the substantial increases in material and equipment costs. These rises will also affect long term averages used to predict future costs.
PNGL / NERA Comment	Given the recent volatility in price indices, a more robust approach is to rely on an alternate method that controls for the forecast economic rebound during GD23, as forecasted by the OBR. In particular, we estimate the historical link between real GDP and CPIH and each nominal index, using OLS regressions with the most recent data possible. <i>[NERA Response, p17]</i>
UR Response	Whilst the rationale for such an approach has merit, it is not entirely clear that it is more robust in times of volatility. Forecasts of materials or equipment costs will be dependent upon accurate estimates of future inflation and GDP, which can be difficult to predict. UR would also expect other factors to influence these costs.
PNGL / NERA Comment	Based on historical data only, we estimate that 1% inflation drives FOCOS growth of more than 5%. Thus, the OBR's forecast of even higher inflation in 2022 and (to a lesser extent) 2023 suggests that the FOCOS series will grow at a rate of over 40% in 2022. <i>[NERA Response, p18]</i>
UR Response	Provisional FOCOS increases for Q2 of 2022 are in the region of 30% based on the most up-to-date data from BCIS. Whilst well above the long-term average, this is materially below that predicted by the NERA regressions. This is not necessarily a criticism of the regression approach, merely a recognition of the difficulty of forecasting during such volatility.
PNGL / NERA Comment	We conclude that the implicit assumption of an immediate return to long-term trends is not fit for purpose given the near consensus of macroeconomic volatility in the next year, very likely leading to further materials price inflation above the level of general inflation. <i>[NERA Response, p22]</i>
UR Response	OBR forecasts for both labour and inflation costs are largely back to what might be considered 'normal' by 2024. UR has however taken on board the GDN feedback and adopted a conservative forecast for inflation. Furthermore, it has been assumed that there is a more gradual return to normality in 2023 with long-term averages not being used until 2024.
PNGL / NERA Comment	From the quantitative evidence alone, it appears that there is no case for positive OE target at GD23. <i>[NERA Response, p24]</i>
UR Response	Such a conclusion can only be reached by restricting data considerations to a limited period and gross output (GO) rather than value added (VA) productivity. UR does not consider this approach to be the most appropriate. UR has reviewed different timespans, VA and GO estimates as well as labour productivity forecasts from the OBR. UR has also looked at productivity across all industries and against certain selected industries. Results would indicate that a positive OE target should be applicable.
PNGL / NERA Comment	UR has not sought to include any evidence on whether this is achievable in the specific context of GD23, which is different in both time and geography from RIIO-GD2. <i>[NERA Response, p25]</i>

UR Response	OE ¹⁰ targets are applicable to even the most efficient companies. It is for the GDN to establish why they could not be achieved in an NI context. Whilst there is a timing difference between GD23 and GD-II, it is notable that Ofgem are consulting on a 1.2% totex target for the ED-II draft determination. This suggests that the 1.0% per annum challenge by the UR is still applicable.
PNGL / NERA Comment	Value Added (VA) TFP growth is not theoretically applicable to regulated networks because it excludes intermediate costs, which are included in GDNs revenue allowances. [NERA Response, p25]
UR Response	UR considers that the VA approach still merits use given the availability of data, issues with GO approach and the fact that the majority of GDN spend is labour related.
PNGL / NERA Comment	Ofgem's selected window for measuring historical productivity placed excessive weight on high productivity gains achieved during the dot-com bubble of the late 1990s. This productivity growth is no longer relevant or likely to repeat itself during GD23. [NERA Response, p26]
UR Response	The selected timeframes do not place excessive weight on high productivity years. They are given equal weighting along with the low productivity years. This approach is the same as that adopted for RPEs, even though the most recent price rises may not be repeated in the short-term. UR considers this the most justifiable and consistent approach.
PNGL / NERA Comment	As UR notes, those challenges were unsuccessful and the CMA did not conclude that Ofgem had been wrong in its approach. However, contrary to UR's claim, the CMA did not "endorse" any element of Ofgem's approach – it simply concluded that the Core OE selected by Ofgem was within the realms of regulatory precedent and not inconsistent with the evidence reviewed by Ofgem in the round. [NERA Response, p26]
UR Response	The GDN is correct to highlight that the CMA review is not an explicit endorsement. NERA also correctly points out that, "it simply concluded that the core OE selected by Ofgem was within the realms of regulatory precedent and not inconsistent with the evidence reviewed by Ofgem in the round." UR agrees with this assessment and has adopted a similar approach.
PNGL / NERA Comment	Of the four companies Ofgem claimed to have submitted these OE forecasts, only one is a GDN. The only submission potentially relevant to PNGL is SGN's submission, and this was agreed by all parties to be a mathematical error. SGN argued that its (corrected) 0.83% included a mix of both OE and catch-up efficiency, and that its actual OE was 0.7%. The other three companies in the comparator set are not relevant because they are all transmission companies, and two of them are electricity transmission companies. Thus, they all face different cost structures than a GDN. [NERA Response, p26-27]
UR Response	The GDN is correct to detail the actual OE figure as clarified by the CMA referral. However, UR does not agree that other comparators are not relevant because of the different cost structures. Given similar activities in terms of construction, maintenance and compliance, gas and electricity DNOs and TSOs provide useful indicators as to the level of OE achievable.
PNGL / NERA Comment	SPT's ¹¹ business plan likely includes some catch-up efficiency and NGET ¹² and NGGT's ¹³ OE submission was on an opex basis, which is a relatively small part of their cost base. On a totex basis, the equivalent figure is 0.4% for NGET. [NERA Response, p27]

¹⁰ OE = Ongoing Efficiency.

¹¹ SPT = Scottish Power Transmission.

¹² NGET = National Grid Electricity Transmission.

¹³ NGGT = National Grid Gas Transmission.

UR Response	It is unclear to the UR if catch-up efficiency is included in the SPT business plan. Whilst the 0.4% figure was detailed in the CMA referral for NGET, Ofgem has indicated that ENWL ¹⁴ included a 1% ongoing efficiency assumption for totex in their business plan (See <i>R110-ED2 Draft Determination</i> , p364, para 7.460). This would lend further precedent support from a regulated electricity distribution company for the UR target imposed at the draft stage.
PNGL / NERA Comment	The small size of the NI companies relative to the GB GDNs means that they may have more difficulty in achieving scale efficiencies that GB GDNs can achieve. This is a challenge both in comparing the static level of efficient costs (i.e. through opex benchmarking) and the change in efficient costs (i.e. through the OE assumption). [NERA Response, p28]
UR Response	Small size may present a challenge when benchmarking static costs, though this can be adjusted for using different methodologies. However, UR does not consider that evidence has been provided as to why this would affect the rate of change of efficient costs or labour productivity.
PNGL / NERA Comment	PNGL is a much newer business than GB GDNs and hence has fewer baked-in inefficiencies that it can achieve. PNGL's network has been predominantly plastic from the beginning, and so PNGL cannot strip out the inefficiency that does not exist. [NERA Response, p28]
UR Response	The OE challenge represents improvement at the frontier, which is expected of even the most efficient companies. UR has not imposed any catch-up targets on the GDNs, so is content that the existing OE target is appropriate.
PNGL / NERA Comment	Given the current circumstances, it is not appropriate for UR to "aim up" in the range of available evidence. At a minimum, UR should separately consider the range of evidence used by Ofgem (largely pointing to a lower OE target), and independently justify why it in 2022, like Ofgem in 2020, considers it appropriate to continue to "aim up". [NERA Response, p30]
UR Response	Whilst the targets are towards the top of the evidence range, UR does not consider the challenge to be "aiming up". This seems particularly pertinent given the most recent Ofgem proposals of 1.2% per annum totex efficiency challenge suggested for electricity DNOs in 2022. Whilst the UR could potentially have imposed more stretching OE targets, it has not chosen to do so for the final determination.
PNGL / NERA Comment	As an overall point, we find that UR's discussion of OE in the Draft Determination is extremely limited and does not provide a thorough consideration of the economic evidence on the appropriate level of the OE target. For the final determinations, we recommend that the UR assess the evidence presented on its merits. [NERA Response, p30]
UR Response	UR has attempted to address all the relevant points raised within this Annex.
GDN views and UR Responses	
SGN Comment	Welcome the inclusion of Real Price Effects (RPEs) as part of the price control setting and accept the requirement to apply an efficiency challenge to the business. However, we strongly believe that the current proposed indices are not adequately addressing the recent step change in the markets. [SGN Response, p125]

¹⁴ ENWL = Electricity North West.

UR Response	Within the final opex methodology, UR has used the 2022 provisional data to account for the significant increases in material and equipment costs. A stepped approach is used for 2023 with long-term averages only used from 2024 onwards. These averages also incorporate the most recent price increases for future years. For capex RPEs, UR has taken on board GDN feedback and actual contractor cost information for 2022. This has resulted in a material change to the capex frontier shift for the GD23 period.
SGN Comment	Strongly believe that applying a 1% efficiency challenge deemed relevant to established companies to a company in the early stages of its maturity is wrong. <i>[SGN Response, p125]</i>
UR Response	The OE challenge represents improvement at the frontier, which is expected of even the most efficient companies. Arguably, a company in its relevant infancy has a greater scope for efficiency improvement, assuming that optimum working practices are achieved with time and experience.
SGN Comment	UR have failed to consider SGN NG's proposal of a true-up mechanism being introduced for RPEs. <i>[SGN Response, p125]</i>
UR Response	A true-up mechanism is a reasonable suggestion. However, UR has not adopted such an approach given the added complication and the protection afforded to GDNs by uplifting revenues with general inflation. Given that the indices are a proxy for gas industry costs, any adjustment will not be perfect. The evidence presented on actual contractor capital costs for 2022 highlights this issue. Consequently, no change has been considered necessary.
SGN Comment	UR must update the indices to include the latest available data. <i>[SGN Response, p126]</i>
UR Response	Data has been updated with the latest available information as part of the final determination exercise.
SGN Comment	We strongly believe that due to the continued price movements and levels of uncertainty in the market, it is important the UR consider an annual true up provision, as has been adopted by Ofgem. If such a mechanism is not introduced, aiming up in the forecasting of RPEs is required to align to current market expectations. <i>[SGN Response, p126]</i>
UR Response	An annual 'true-up' provision is likely to impose unnecessary burden and complexity. However, UR has taken a conservative approach to RPEs and inflation assumptions. This is particularly true for capital costs where actual contractor information for 2022 has been accepted.
SGN Comment	As a minimum, the UR should include the updated OBR average earnings in the FD for the GD23 price control, but consideration should be given to the potential impacts on the average earnings over the next few years as the cost-of-living issues are addressed. <i>[SGN Response, p127]</i>

UR Response	Latest estimates from the OBR March 2022 Economic & Fiscal Outlook have been included in the final analysis. UR has also used more up-to-date inflation forecasts from BoE and HMT.
SGN Comment	For both the FOCOS and NOCOS the latest available data covers the 1991 to 2021 period. <i>[SGN Response, p127]</i>
UR Response	The GDN is correct to point out this error in the draft determination methodology. The latest data for these indices has been incorporated into the analysis.
SGN Comment	We are concerned that if the RPEs are insufficient to reflect the recent price increases, especially within the materials weighting of which has seen a significant step change, that SGN NG could be unfairly penalised. <i>[SGN Response, p131]</i>
UR Response	Whilst this is a risk to the GDN, the consumer also takes risk that input prices lag behind forecasts. This is particularly true for wages, which tend to lag behind inflation and make up a higher proportion of spend. The existing approach therefore represents a 'fair-bet' approach that the UR considers to be justified.
SGN Comment	We identified several key factors as to why a similar level of efficiency is not achievable: <ul style="list-style-type: none"> • SGN NG is still in the early stages of a growth cycle with focus predominately on marketing and connecting customers to the network • Higher proportion of fixed costs against a low level of output. • The direct activities are predominately undertaken by a contractor; as a result, we continue to be more susceptible to changes in the economic climate. • Difficulties in recruiting and retaining resources with relevant gas safety accreditation. • The current contracting structure in place in SGN NG. <i>[SGN Response, p132]</i>
UR Response	Many of the issues raised would seem to point to the possibility of a higher level of efficiency being possible, particularly as the GDN expands activity. SGN has also raised the issue of contracting which is within management control. These factors do not represent a good rationale for reducing the efficiency challenge.
SGN Comment	It is incorrect for the UR to assume that the similar levels of productivity deemed relevant to Great Britain GDNs are achievable in NI. As identified by Ulster University in a May 2019 report, 'productivity levels in NI are still more than 15 percent below the UK average'. <i>[SGN Response, p132]</i>
UR Response	It is true to state that productivity has long been lower in NI than that achieved in the UK as a whole. This however is not an argument for reducing the OE challenge for GDNs. The key issue is the rate of change. NI productivity has marginally caught up with the UK since 1998. Productivity has increased faster than both England and Wales but lags behind Scotland. This suggests that the OE challenge applicable to GB companies should also be replicated in Northern Ireland.
SGN Comment	We continue to believe, based on a balanced view of the available data that a 'productivity growth assumption of 0.35%' continues to be a challenging but fair position when considering the current economic climate. <i>[SGN Response, p132]</i>

UR Response	Based on the available evidence and the precedent from others, UR does not consider the SGN assumption to be a challenging one. Nor does the UR consider a need to deviate from the 1% per annum challenge, as set out in the draft consultation.
GDN views and UR Responses	
FE Comment	The time horizon the Utility Regulator uses in calculating its average materials inflation forecast departs from Ofgem’s final determination on RPEs at RIIO-GD2, in which long-term average annual growth rates include data from 2000 onwards. Further, the Utility Regulator has not provided an explanation of the grounds for this divergence. [Response, p58]
UR Response	Within the final determination methodology, UR has tried to use the longest time series of data available. This includes the latest available price increases including provisional estimates for 2022 where possible.
FE Comment	In our view, the backwards looking nature of the Utility Regulator’s input inflation estimate for materials fails to account for these more recent trends and is therefore likely to be very conservative for the GD23 period. [Response, p58]
UR Response	Within the final opex methodology, UR has used the 2021 outturn data and the 2022 provisional data to account for the large increases in material and equipment costs. A stepped approach is used for 2023 with long-term averages only used from 2024 onwards.
FE Comment	We consider that the Utility Regulator should take account of the following factors: <ul style="list-style-type: none"> • A structural productivity slowdown in the UK since 2008, and • The impact of the COVID-19 pandemic on the potential for productivity growth. [Response, p59]
UR Response	UR has taken account of both these issues in our analysis in terms of the information reviewed. However, the review has not been limited to data post 2008. UR has also taken the latest OBR forecasts of labour productivity into consideration. These account for both of the issues raised and still project labour improvements at an average of 1% p.a. per hour worked.
FE Comment	We consider that the Utility Regulator’s proposal on ongoing productivity adjustment is likely to be beyond the top end of the achievable range over the GD23 period, with wider evidence to support a more conservative adjustment. [Response, p59]
UR Response	The 1% target is neither above the top end of the range nor the precedent established for both gas and electric distribution companies regulated by Ofgem. UR is therefore content to retain the existing productivity challenge.

Table 1.1: UR summary responses to GDN comments on draft determination.

1.7 As detailed in the responses table, some material changes have been implemented between draft and final determination. These are set out in full in the following chapters.

2. Real Price Effects

Background

- 2.1 The cost of a company's inputs may vary over time. Price controls have usually been indexed by a measure of general inflation to account for broad changes in prices. Historically, the measure used has been the Retail Price Index (RPI). More recently, this has been moving to newer measures such as the Consumer Prices Index (CPI) or Consumer Prices Index including owner occupied housing costs (CPIH).
- 2.2 However, not all types of cost changes experienced by a network business will be reflected in the basket of prices used to calculate the general inflation measure.
- 2.3 To account for this, it is common practice to calculate and make adjustments for the difference between particular input price changes for a company or industry and the general measure of inflation. This difference is described as real price effects (RPEs).

Company business plan submissions

- 2.4 All the GDNs provided supplementary papers to address real price effects within their business plan submissions.
- 2.5 Firmus Energy (FE) focused on the assumptions that Ofgem made in its RIIO-GD2 price control, as the most recent regulatory decision available at that time. The information led FE to propose the use of the RIIO-GD2 RPE 2021 - 2026 forecasts for GD23, as set out in Ofgem's final determination, as applied to labour and materials inputs¹⁵.
- 2.6 The Phoenix Natural Gas Ltd (PNGL) supplementary paper on frontier shift in their business plan submission was produced by NERA Economic Consulting. This contained suggested RPEs and productivity figures for GD23, taken from a review of various information sources.
- 2.7 For labour costs, PNGL sub-divided the category into general and specialist. They also argued for private sector wages to be used as a measure of general labour costs. SGN also proposed different weights for opex and capex input prices. As a result, the RPEs proposed by the GDNs measured against CPIH were as follows:

¹⁵ https://www.ofgem.gov.uk/sites/default/files/docs/2020/12/final_determinations_-_core_document.pdf#page=68

GDN business plans - real price effects proposals	2021	2022	2023	2024	2025	2026	2027	2028	Average
FE	-0.6%	-1.1%	1.6%	1.9%	1.8%	1.8%	1.8%	1.8%	1.1%
PNGL	-0.6%	-1.0%	0.4%	0.8%	1.4%	1.3%	1.3%	1.3%	0.6%
SGN (opex)	-1.0%	-2.0%	1.0%	1.4%	1.4%	1.4%	1.4%	1.4%	0.6%
SGN (capex)	-0.5%	-1.5%	1.5%	1.9%	1.9%	1.9%	1.9%	1.9%	1.1%

Table 2.1: GDN business plan estimates of real price effects by year.

- 2.8 UR position at the draft stage was an RPE of **+0.8%** per annum on average over the 2021-28 period. Full details on this calculation are set out in the draft documentation published in March 2022.
- 2.9 Various responses to the real price effects draft decision were made. PNGL opted to formally revise their request with RPEs increasing to **+1.5%** per annum based on OLS regressions.

Final Determination Methodology

Weights

- 2.10 To estimate RPEs we first separate a company's input costs into various input types. This is a necessary step as input prices in different cost categories may vary by input type.
- 2.11 Nominal price inflation for each category of cost is then calculated. Finally, accounting for general inflation (CPIH) and applying weights to each input category, an overall value or weighted average RPE is calculated.
- 2.12 For GD23, the adoption of weights specific to each company was considered. Following deliberation, it has been decided not to adopt this approach. Such a method could be inconsistent with the principal objective of RPEs – estimating the likely shift in the industry frontier.
- 2.13 UR approach thereby avoids any risk that the frontier shift essentially passes through company costs via an RPE assessment that mirrors a company's actual cost proportions. Rather, the cost weights apply to an efficient company at the frontier.
- 2.14 UR weights are based on industry figures from Ofgem. From their analysis, we note that the same labour cost indices were applied to both general and specialist labour costs. That is, while presented as two categories of general and specialist, cost inflation for both are in practice addressed as if a single category. As such, we present the labour input cost category here as a single category to reflect Ofgem treatment of labour input price inflation.

Cost Category	RIO-GD2	GD23
General labour	41%	70%
Specialist labour	29%	
Materials	14%	14%
Plant and equipment	4%	4%
Transport	2%	2%
Other	9%	9%

Table 2.2: GD23 RPE cost categories and weights, adopted from Ofgem's RIO-GD2 RPEs final determination

2.15 These weightings have not changed from draft to final determination. SGN did raise a concern that it could be unfairly penalised if RPEs did not adequately reflect material price increases. UR has however provided material uplifts to the capex RPE due to contractor information.

Input prices - labour

2.16 As the cost category of labour makes up over half of the opex and capex, it is important that the figures used for these input prices are both fair and robust.

2.17 For the GD17 analysis, UR used average earnings data to assess labour cost changes. Forecasts for this data series are provided by OBR. For GD23, continuity of this approach was adopted given the reliable data source. UR also applied the chosen data source to both general and specialist labour categories.

2.18 PNGL raised a number of issues with this approach. Most notably that:

- 1) UR use of the economy-wide wage measure for its labour index is inconsistent with PNGL's status as a private sector employer.
- 2) Using the OBR wage index for both general and specialist labour does not capture the fact that specialist engineers earn wages that have historically grown differently from the rest of the economy.
- 3) Ofgem recognises that GDNs labour force contains a significant contingent of specialist workers, and UR should account for that also in calculating the labour RPEs.

2.19 With respect to the first issue, the graph below details the comparison of annual growth rates of the economy-wide earnings against private sector wage growth.

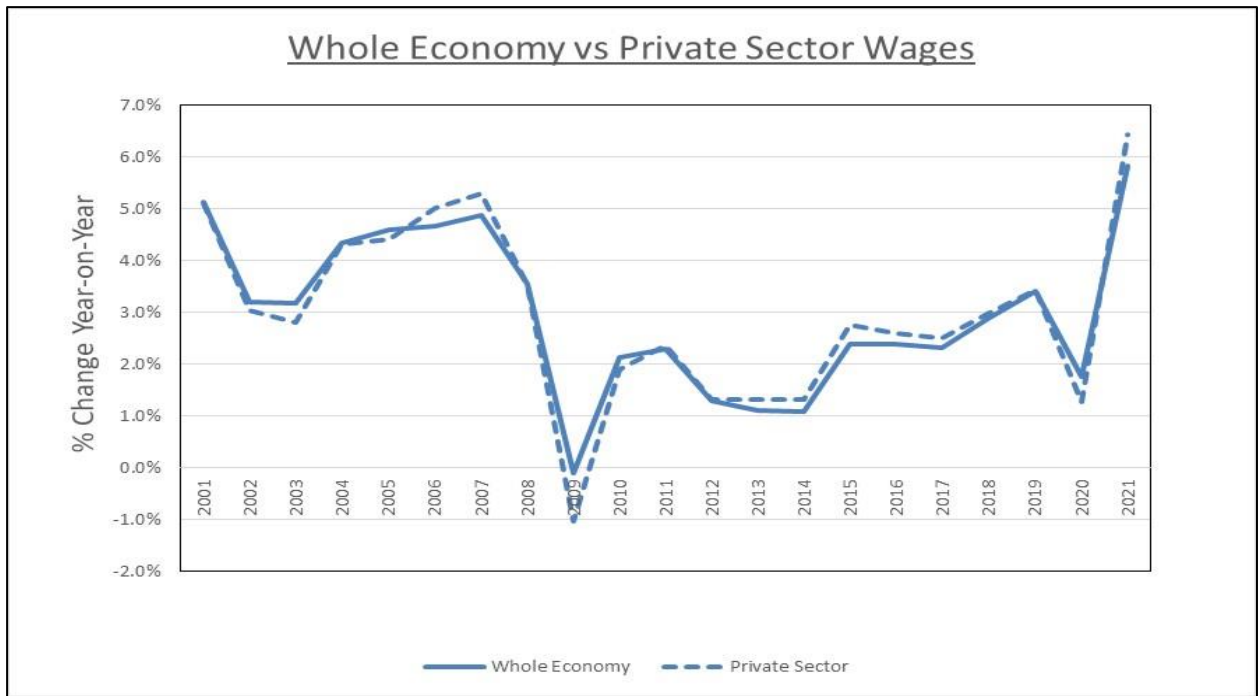


Figure 2.1: Average earnings growth of the whole economy vs private sector wage growth – ONS data

- 2.20 Since 2000, differences have been marginal and the long-term average over the past 21 years is 3.0% p.a. for both metrics. Consequently, UR does not see good reason to amend the current approach of using the OBR whole economy earnings forecasts.
- 2.21 For specialist labour, it is true that certain BCIS labour indices have grown faster than the ONS average weekly earnings indicator for the whole economy. However, since 2000 general construction wages have actually grown at 2.9% per annum, slightly lower than the 3.0% p.a. whole economy wage growth.

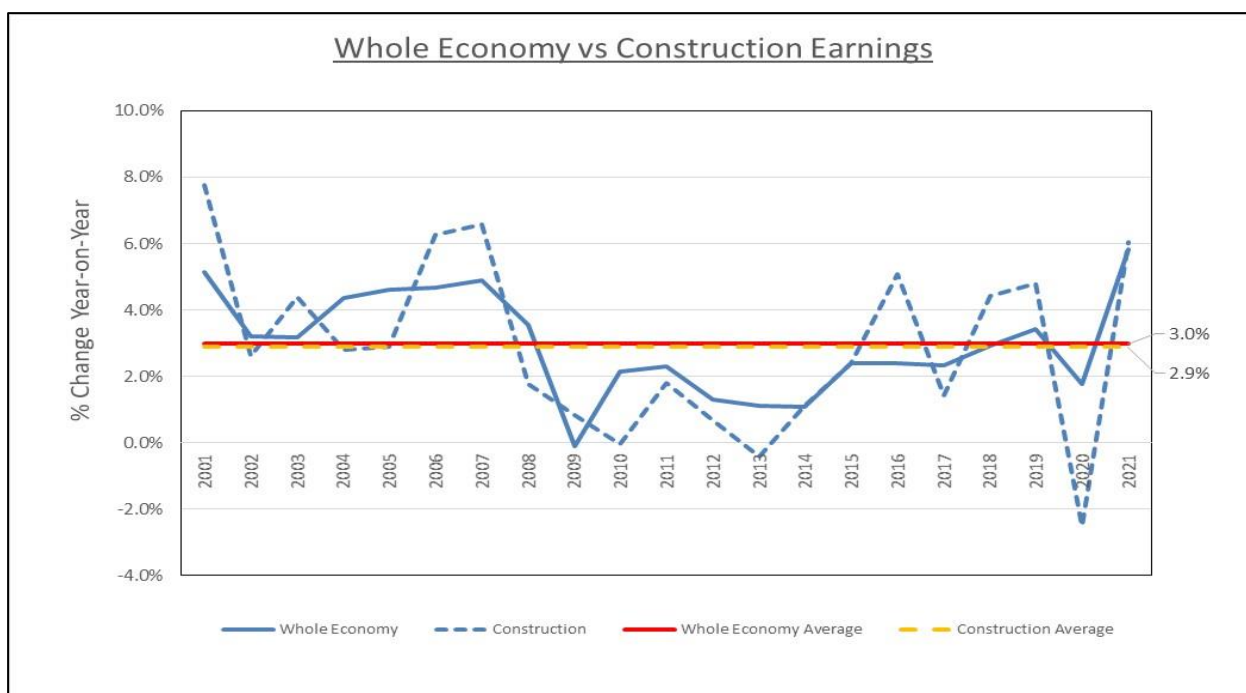


Figure 2.2: Average earnings growth of the whole economy vs construction sector wage growth – ONS data

2.22 It is also the case that for the available dataset from 2011 for civil engineering labour costs (4/CE/01); wage growth has again been slightly lower than the corresponding figure for the whole economy. Such findings suggest that a specialist labour cost adjustment is not necessary.

2.23 UR is also concerned that to focus on only some labour costs would be an asymmetric approach to the detriment of consumers. For instance, data from the ASHE¹⁶ since 2011 indicates that other roles that may be pertinent to GDNs such as *professional, scientific & technical* activities or *advertising and market research* has seen wage growth lower than the whole economy average.

	Whole Economy (K54U)	Labour & Supervision (90/1)	Labour & Supervision in Civil Eng. (70/1)	PAFI Civil Eng. Labour (4/CE/01)	Prof, Scientific & Tech ¹⁷	Advertising and Market Research ¹⁸
Average of %'s (Since 2001)	3.0%	3.7%	3.7%	N/A	N/A	N/A
Average of %'s (Since 2011)	2.4%	2.3%	2.3%	2.3%	1.4%	1.9%

Table 2.3: ONS wage growth for different sectors and periods

¹⁶ ASHE = Annual Survey of Hours and Earnings.

¹⁷ Figures calculated from Table 16.1a of ASHE for median gross weekly pay all employees, Code M.

¹⁸ Figures calculated from Table 16.1a of ASHE for median gross weekly pay all employees, Code 73.

- 2.24 Given that GDNs employ material numbers of marketing staff and professional and technical services, such wage rate growth would also need to be taken into account if considering specialist labour.
- 2.25 UR does not consider this to be warranted, as the whole economy figure seems to be a reasonable proxy. However, it would be considered asymmetric and incorrect only to adjust for labour costs that are above the economy average.
- 2.26 Table 2.4 below shows the OBR forecast annual amounts of average earnings growth that we apply at final determination. For the years for which no forecast is available, we apply the last year of forecast made by OBR.

Labour market	% change on year earlier, unless otherwise stated							
	2021	2022	2023	2024	2025	2026	2027	2028
Average earnings	6.2%	5.3%	2.8%	2.6%	2.9%	3.2%	3.2%	3.2%

Table 2.4: OBR Economic and Fiscal Outlook, March 2022

- 2.27 These figures are different from the draft position reflecting the latest OBR forecast. The methodology applied is however the same as previously.

Input prices - materials

- 2.28 The next category we assess is materials, which make up 14% of input costs in the structure applied. This is an important consideration of RPEs.
- 2.29 Analysis for this area uses data from the Building Cost Information Service (BCIS) and the Department for Business, Innovation and Skills (BIS). At draft, we applied a simple average of the following materials indices:
- Plastic products including pipes (4/CE/24).
 - PAFI structural steelwork - materials: civil engineering (3/S3).
 - NOCOS resource cost index of building non-housing: materials.
 - FOCOS resource cost index of infrastructure: materials.
- 2.30 These indices have been retained. However, the GDNs did raise some issues. For instance, PNGL pointed out that the UR's plastics series has only existed since 2010, which is a very short window to establish a long-term trend.
- 2.31 They further noted that they do not use the *PAFI structural steelwork materials: civil engineering work* series due to its relatively high volatility compared to other candidate series.

- 2.32 The plastics series used by the UR at draft determination stage (4/CE/24) is the same as that used by Ofgem. UR recognises that either index could be used but that a longer time trend is generally preferable. Consequently, the final determination has adopted the *Pipes & Accessories: Plastics (3/57)* index as suggested by PNGL.
- 2.33 This index has a higher long-term average than the original series. However, this impact is somewhat offset by lower price increases experienced in 2021 and forecast for 2022. UR has used both indices and averaged results to get the plastics material cost impact.
- 2.34 The structural steelwork materials index used at draft stage also aligns with that used by Ofgem. UR did however investigate the volatility issue as detailed by the GDN. Comparison between the two relevant indices are provided in the chart below.

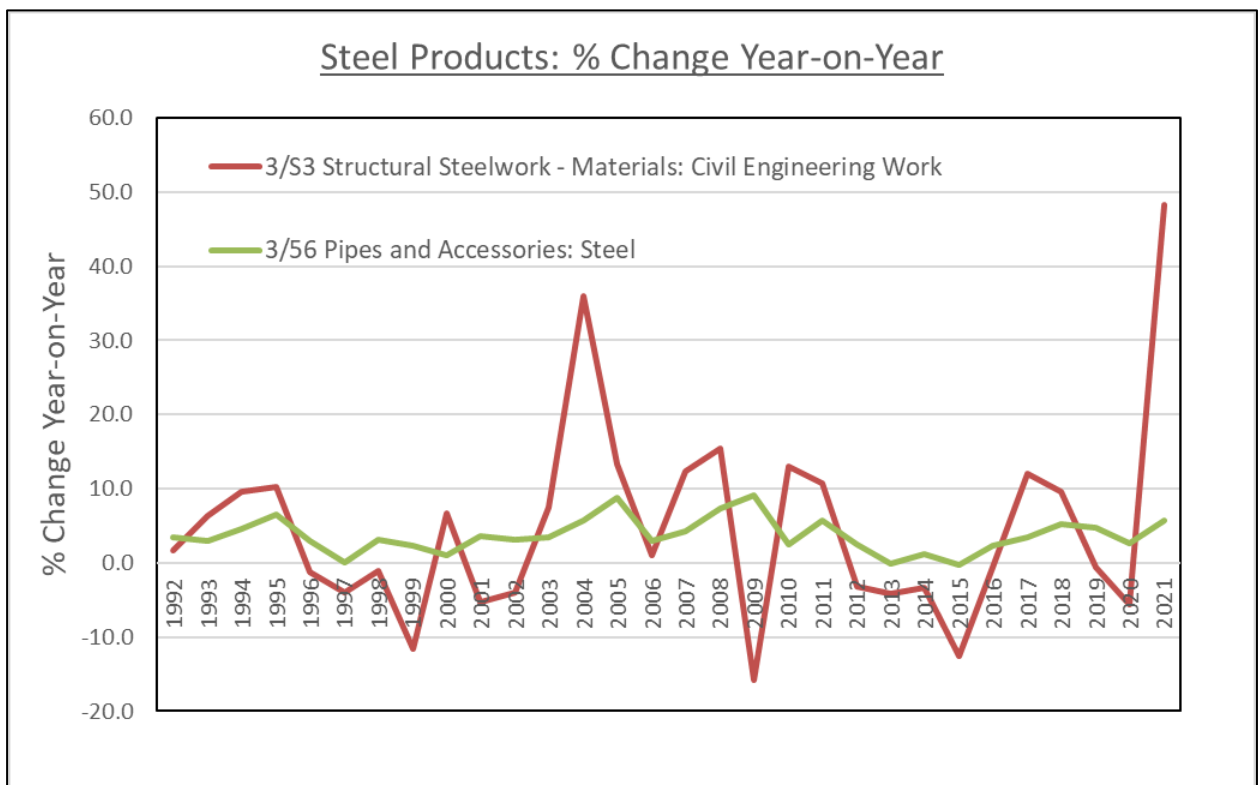


Figure 2.3: Comparison of steel product price indices – BCIS data

- 2.35 The structural steelwork series is clearly more volatile. The long-term average has also been materially impacted by the exceptional increase in 2021, despite being a relatively long time trend.
- 2.36 Given these issues and the fact that PNGL has been unable to distinguish between the two in terms of applicability, UR is inclined to accept the GDN index for final determination. As with plastics, the original series has also been retained and an average used.

- 2.37 Concern was also raised that use of the long-term average ignores the fact that materials prices are very likely to grow rather than shrink in real terms in 2022. PINGL stated that the implicit assumption of an immediate return to long-term trends is not fit for purpose given the near consensus of macroeconomic volatility in the next year.
- 2.38 UR has accepted this argument. OBR forecasts for labour and inflation are largely back to what might be considered 'normal' by 2024. UR has followed this example. There is of course a risk that further material price inflation above the long-term average is experienced. Equally likely however is the risk to consumers that GDNs benefit from labour costs lagging behind general inflation. These reflect normal forecasting and risk issues.
- 2.39 Within the final methodology, UR has used the 2021 outturn data and the 2022 provisional data to account for the increases in material and equipment costs. A stepped approach is also used for 2023 with long-term averages only used from 2024 onwards. These averages also incorporate the most recent price increases for future years.
- 2.40 Combined, the use of these six indices gives substantially different nominal material cost forecasts as follows:

	2021	2022	2023	2024	2025	2026	2027	2028
Materials inflation	15.7%	19.0%	11.3%	3.5%	3.5%	3.5%	3.5%	3.5%

Table 2.5: Materials price inflation

Input prices - equipment and plant

- 2.41 For GD23 equipment and plant cost forecasts, an average of the following indices are used.
- Machinery and Equipment (G6VG) from ONS.
 - BCIS Plant and Road Vehicles (90/2).
- 2.42 The figure below shows the historic growth of the two indices plus an unweighted average of both.

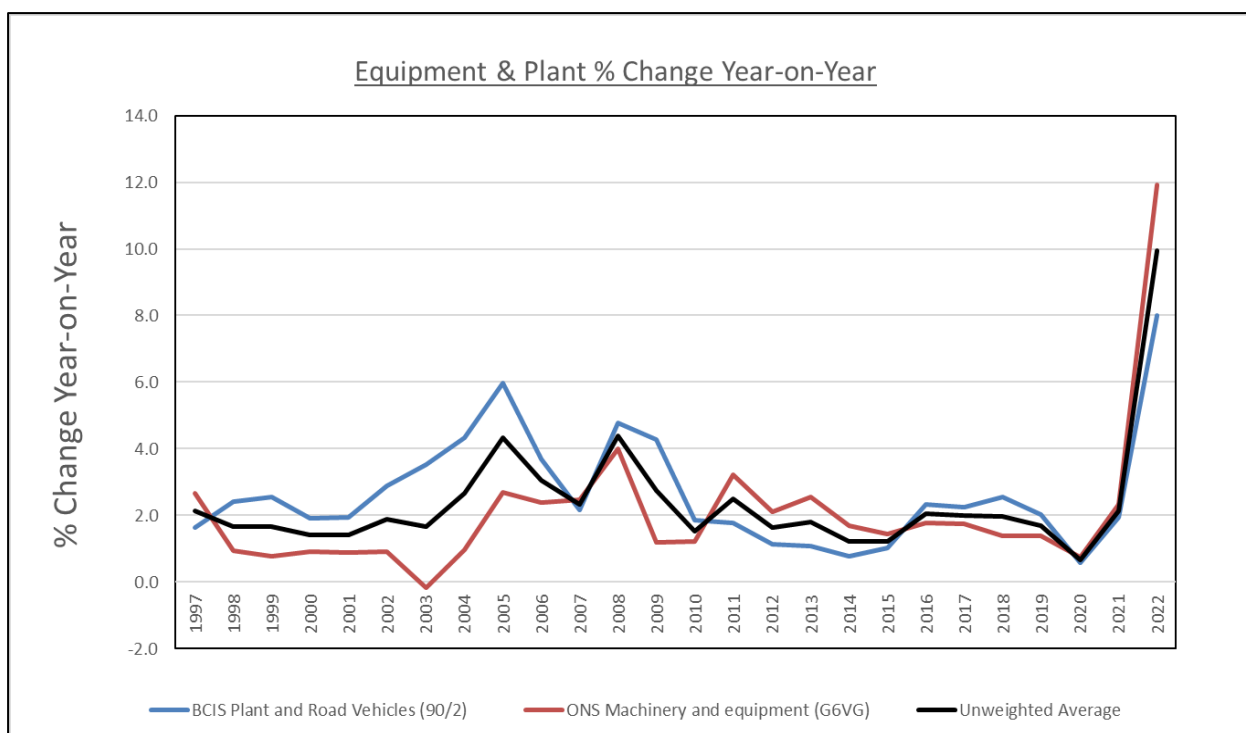


Figure 2.4: Equipment and plant indices inflation, % change

2.43 As can be seen from the graph, provisional figures for 2022 are well above the long-term average. Again, UR has used 2022 provisional data to account for the increases in equipment costs. A stepped approach is also used for 2023 with long-term averages only used from 2024 onwards.

2.44 UR annual amounts for equipment and plant nominal inflation over the GD23 period are shown in the table below.

	2021	2022	2023	2024	2025	2026	2027	2028
E&P inflation	2.1%	10.0%	6.0%	2.1%	2.1%	2.1%	2.1%	2.1%

Table 2.6: Equipment and plant price inflation

Input prices – transport and other

2.45 As was the case in our last GDN price control review (GD17), for the ‘other’ cost categories, it is assumed that prices increase at the same nominal rate as general inflation. In this case, CPIH is the general inflation rate used. This in effect leads to a nil RPE applying to both ‘transport’ and ‘other’ costs.

2.46 PNGL argued that such an approach was not revenue neutral and the wedge between RPI and CPIH should be used for these cost categories. Shifting from RPI to CPIH should generally be revenue neutral. Assuming RPI grows faster than CPIH, this is achieved by providing a higher upfront RPE but inflating by a smaller factor.

- 2.47 If *Transport* and *Other* costs track with CPIH rather than RPI, this will reduce the forecast of nominal input prices. Such an approach would reduce the RPE and the GDN is correct to state that this would not be revenue neutral.
- 2.48 The problem here is the assumption that RPI is the appropriate proxy for predicting changes to these costs. If no better detail is available, general inflation is used as a reasonable proxy for cost increases. This ensures no positive or negative RPE is provided. However, it may well be the case that these cost categories track closer to CPIH than RPI.
- 2.49 By using a long-term wedge as the GDN has suggested, this assumes that these costs will always rise faster than CPIH and a real price effect exists. However, this is not known with any certainty. In the absence of this evidence, it would seem reasonable to predict costs in line with the prevailing inflation factor so that neither the GDN nor the consumer takes unnecessary risk. UR is therefore not minded to adjust the approach to these costs.

Consumer Prices Index projections

- 2.50 As the input prices are in nominal terms, it is necessary to apply an inflation discount in order to transform the calculated price effects into real terms.
- 2.51 We have moved to using CPIH as our inflation measure for GD23. The latest OBR forecasts were published in March 2022. These show CPI increasing rapidly in 2022 with slower growth in 2023 and returning to normality in 2024.
- 2.52 Given that OBR figures are now six months old, it was felt appropriate to consider other more up-to-date forecasts. Use was made of the Bank of England monetary policy report and HMT forecasts

	2022	2023	2024	2025	2026
CPI forecast – March 2022 OBR ¹⁹	7.4%	4.0%	1.5%	1.9%	2.0%
CPI forecast – Aug 2022 BoE Monetary Policy Report ²⁰	9.6%	10.3%	2.7%	1.1%	2.0%
CPI forecast – Aug 2022 HMT Forecasts for UK Economy ²¹	9.3%	6.0%	2.5%	2.6%	2.5%

Table 2.7: Consumer prices index, UR forecast annual % change

- 2.53 As can be seen, there is some large differences between forecasters in short-term estimates. UR would typically use OBR and apply a wedge for the difference between CPI and CPIH. On this occasion, such an approach is not warranted given that figures are out turning higher than OBR expected

¹⁹ Source: OBR March 2022 [Economic and Fiscal Outlook](#), Table 1.7, CPI year-on-year growth.

²⁰ Figures taken from August [BoE Monetary Policy Report](#), Current fan chart data, [Mean forecasts for CPI]. Annual figures have been determined from this quarterly detail.

²¹ Figures taken from August [HMT Forecasts for the UK Economy](#), Table M3, p20, [New forecasts].

in 2022. UR also needs to account for the fact that CPIH is typically 0.1% higher than CPI, but is currently running at 1.2% below CPI.

- 2.54 UR has adopted a conservative position and made a choice to follow HMT pooled forecasts for inflation and assume a more rapid downward trajectory in 2023. BoE forecasts have been adopted beyond 2023. These undershoot the inflation objective then returns to the target rate by 2026.
- 2.55 UR has further assumed that the CPI-CPIH wedge will return to the long-term positive position by the end of 2023. Until then, it has been assumed that CPIH will rise at a slower rate than CPI.
- 2.56 UR forecasts for CPIH are detailed in the table below. The consequence of this conservative approach is to limit the impact of the negative RPE in 2023. Use of BoE forecasts for instance would have imposed a material challenge on the GDNs. UR did not consider this appropriate given volatility and the disagreement amongst forecasters.

	2021	2022	2023	2024	2025	2026	2027	2028
CPIH forecast	2.5%	8.0%	5.6%	2.3%	1.1%	2.1%	2.1%	2.1%

Table 2.8: Consumer prices index, including owner-occupier housing costs (CPIH) UR forecast annual % change

RPEs – opex costs

- 2.57 The opex input price and inflation forecast decisions of the UR are reflected in the RPE table below.

Figures in %	GD17		GD23					
	2021	2022	2023	2024	2025	2026	2027	2028
Labour	6.2%	5.3%	2.8%	2.6%	2.9%	3.2%	3.2%	3.2%
Materials	15.7%	19.0%	11.3%	3.5%	3.5%	3.5%	3.5%	3.5%
Equipment/plant	2.1%	10.0%	6.0%	2.1%	2.1%	2.1%	2.1%	2.1%
Transport	2.5%	8.0%	5.6%	2.3%	1.1%	2.1%	2.1%	2.1%
Other	2.5%	8.0%	5.6%	2.3%	1.1%	2.1%	2.1%	2.1%
Nominal Input Price Inflation	6.9%	7.8%	4.5%	2.7%	2.8%	3.1%	3.1%	3.1%
CPIH forecast	2.5%	8.0%	5.6%	2.3%	1.1%	2.1%	2.1%	2.1%
RPE for Opex (Annual)	4.3%	-0.2%	-1.0%	0.4%	1.6%	1.0%	1.0%	1.0%

Table 2.9: RPE forecast for Opex

- 2.58 Over the eight-year period, the opex RPE is estimated at an average of **+1.0%** per annum. This is an uplift from the draft position.

RPEs – capital costs

- 2.59 The methodology for opex and capex is for the most part very similar. However, as part of the ongoing engagement, GDNs have reported capital cost pressures in excess of inflation in 2022. All companies employ the same contractor for capital works.
- 2.60 Firmus and SGN have contracts based on a schedule of rates. Each has been approached by their contractor for an increase in rates. This request is in excess of the allowance for inflation of the order of 6%.
- 2.61 PNGL has a contract based on a schedule of rates with a pain-gain mechanism against actual costs. It has visibility of actual costs incurred by the contractor and has indicated it undertakes sample audits of these costs on a monthly basis. The level of overspend by the contractor has reached a level that the pain-gain mechanism has been set aside. PNGL is currently paying the actual costs of the contractor.
- 2.62 Both Firmus and SGN have shared the submissions received from their contractor to support increased costs. PNGL provided more direct data based on actual costs for the installation on services by month from 2020.
- 2.63 The trend in real costs (CPIH adjusted) of services from 2020 to 2022 by month shows a sustained real terms cost increases from about April 2021. Costs in the first half of 2022 are 10% higher than costs in 2020 in real terms. This is not reflected in the RPE assessment given the material increase in inflation forecast for 2022.
- 2.64 In view of the consistent reports of cost pressures from the GDNs and the fact that both PNGL and SGN are paying increased costs, UR has accepted the evidence. Nominal prices have been adjusted accordingly.

Figures in %	GD17		GD23					
	2021	2022	2023	2024	2025	2026	2027	2028
Labour	6.2%	17.0%	2.8%	2.6%	2.9%	3.2%	3.2%	3.2%
Materials	15.7%	17.0%	11.3%	3.5%	3.5%	3.5%	3.5%	3.5%
Equipment/plant	2.1%	17.0%	6.0%	2.1%	2.1%	2.1%	2.1%	2.1%
Transport	2.5%	17.0%	5.6%	2.3%	1.1%	2.1%	2.1%	2.1%
Other	2.5%	17.0%	5.6%	2.3%	1.1%	2.1%	2.1%	2.1%
Nominal Input Price Inflation	6.9%	17.0%	4.5%	2.7%	2.8%	3.1%	3.1%	3.1%
CPIH forecast	2.5%	8.0%	5.6%	2.3%	1.1%	2.1%	2.1%	2.1%
RPE for Capex (Annual)	4.3%	8.3%	-1.0%	0.4%	1.6%	1.0%	1.0%	1.0%

Table 2.10: RPE forecast for Capex

- 2.65 The allowance is based on actual capex being 10.7% above inflation for 2022, assuming that the 1% productivity has been achieved. Future figures are as forecast for opex. For capex, use of contractor costs in 2022 has resulted in an RPE estimated at an average of **+2.1%** per annum over the 2021-28 period. This is in excess of business plan requests.
- 2.66 PNGL has noted the upward trend in costs and asked that this be projected forward for a further year when determining rates for GD23. This has been rejected. There is every possibility that cost will begin to fall in 2023 as economic constraints reduce demand for construction and local investment programmes (such as rural broadband rollout) end.
- 2.67 UR expectation is that future frontier shift may fall below inflation as volumes of work reduce, before returning to move parallel to inflation in the medium term. As a result, the final determination allows for some headroom in capital costs.
- 2.68 Consumers are however somewhat protected in respect of underspends. Under the capex cost sharing mechanism, 75% of any saving against the determined values is returned to consumers.

Other Issues

Regression Analysis

- 2.69 PNGL argued that a more robust approach to input price forecasting is to rely on an alternate method that controls for the economic rebound predicted during GD23. In particular, they focused on estimating the historical link between real GDP and CPIH and each nominal index, using OLS²² regressions. The result of this analysis is an average RPE of +1.5% per annum over the 2021-28 period.
- 2.70 Whilst the rationale for such an approach has merit, it is not entirely clear that it is more robust in times of volatility. Forecasts of materials or equipment costs will be dependent upon accurate estimates of future inflation and GDP, which can be difficult to predict. UR would also expect other factors to influence these materials and plant costs.
- 2.71 Upon review of the OLS methodology, UR considers that a mistake has been made with respect to future time trend figures. It would appear that incorrect time values have been used for future periods. The trend should increase consecutively by each quarter but the starting value is in error. When corrected, this reduces the average RPE to +1.3% per annum.

²² OLS = Ordinary Least Squares.

- 2.72 The RPE figure quoted by the GDN is also dependent upon adoption of specialist labour indices and an RPE for *Transport* and *Other* costs. As explained above, UR does not accept these adjustments. When amended to the final determination methodology, UR calculates an average RPE of +1.1% per year using these regressions. This is similar to the +1.0% final determination conclusion for opex frontier shift.
- 2.73 Given the similarity, UR has not adopted the regression approach advocated by PNGL. UR does however consider it a useful comparative exercise to determine the validity of input price forecasts.

True-up mechanism

- 2.74 SGN raised the issue of a 'true-up' mechanism for RPEs. They also argued that if such a mechanism is not introduced, aiming up in the forecasting of RPEs is required to align to current market expectations.
- 2.75 A 'true-up' mechanism is a reasonable suggestion. However, UR has not adopted such an approach given the added complication and the protection afforded to GDNs by uplifting revenues with general inflation.
- 2.76 Given that the indices are a proxy for gas industry costs, any adjustment will not be perfect. The evidence presented on actual contractor capital costs for 2022 highlights this issue. Consequently, no change has been considered necessary. UR does however consider that a conservative approach to both inflation and input price forecasts has been adopted.
- 2.77 SGN was also concerned that if the RPEs are insufficient to reflect the recent price increases, SGN could be unfairly penalised. Whilst this is a risk to the GDN, the consumer also takes risk that input prices lag behind forecasts. This is particularly true for wages, which tend to lag behind inflation and make up a higher proportion of spend.
- 2.78 The existing approach therefore represents a 'fair-bet' that the UR considers to be justified. However, material changes have been incorporated into the capex analysis to address above inflation cost increases in 2022.

Use of long-term averages

- 2.79 Firmus indicated that the time horizon used for calculating materials inflation forecast departs from Ofgem's final determination, in which long-term average annual growth rates include data from 2000 onwards.
- 2.80 Within the final determination methodology, UR has tried to use the longest time series of data available. This includes the latest available price increases including provisional estimates for 2022 where possible.

- 2.81 Like other GDNs, Firmus raised concerns about the backwards looking nature of the UR input inflation estimate. Within the final opex methodology, UR has used the 2022 provisional data to account for the large increases in material and equipment costs. A stepped approach is also used for 2023 with long-term averages only used from 2024 onwards.
- 2.82 UR considers such an approach to be conservative and reasonable given the existing volatility.

3. Productivity

Background

- 3.1 A company can become more efficient over time and so close the gap between its efficiency level and that of the economic frontier. Equally, the industry's overall efficiency or frontier can change over time. It is possible the most efficient company in an industry can find new or improved ways of using less input volumes to maintain current output levels.

Company business plan submissions

- 3.2 All the GDNs provided estimates of frontier productivity improvement to apply in GD23. These proposals are shown below.

GDN	Opex	Capex
FE	0.85%	0.75%
PNGL	0.40%	0.34%
SGN	0.23%	0.35%

Table 3.1: Annual productivity improvements proposed by GDNs

- 3.3 Firmus focused on the RIIO-GD2 decisions from Ofgem. In particular, on the ongoing efficiency (OE) range proposed by Ofgem's advisors, CEPA. Firmus calculated a mid-point of the CEPA range as their GD23 productivity.
- 3.4 PNGL submitted a paper provided by their advisors, NERA. This set out how their OE proposals were arrived at. Topics covered included: use of growth accounting data (EU KLEMS²³); productivity input and output measures and the time period assessed.
- 3.5 NERA used EU KLEMS data from three sectors: (i) construction; (ii) wholesale retail trade: repair of motor vehicles and (iii) total manufacturing. An average of total factor productivity (TFP) and partial factor productivity measures for three sectors gave the opex amount. An average of TFP for the three sectors gave the capex amount. All used the gross output (GO) measure, rather than the value added (VA).
- 3.6 SGN also looked at the recent RIIO-GD2 price control to establish a range of possible productivity improvement for GD23. Based on the development stage of SGN (relative maturity of the network), they believed productivity improvements exhibited by mature GDNs should not be applied to them.

²³ <https://euklems.eu> (2019 release)

This has the effect of reducing their proposed productivity improvement as they 'aim down' within the range of possible estimates.

Our draft assessment

- 3.7 Given the Ofgem productivity conclusions and the views of GB companies on what productivity is achievable, we proposed a target for the GDNs opex and capex as detailed below. Further detail on the rationale is set out in the draft documents.

	Opex	Capex
Productivity change	1.0%	1.0%

Table 3.2: GD23 productivity target (%) at draft determination

Final Determination Methodology

Regulatory precedent

- 3.8 In their decision for productivity improvement for RIIO-GD2, Ofgem assessed the productivity improvement that could be observed from comparator sectors to the GB GDNs using EU KLEMS data. This was one factor in establishing the range of possible productivity improvement for GB GDNs.
- 3.9 The different types of productivity measures and comparator sets considered by Ofgem are shown in the table below. As can be seen, there is a range of possible productivity change presented from the data selected.

Figures given in % terms	Productivity measure ²⁴			
Unweighted average of selected industries (opex) ²⁵	TFP VA	LP VA	TFP GO	LEMS GO
Full dataset (1995 - 2016)	0.78	1.15	0.36	0.42
2006 - 2016	-0.49	-0.77	-0.21	-0.25
1997 - 2016	0.51	0.77	0.24	0.28
Weighted average of all industries (capex) ²⁶	TFP VA	LP VA	TFP GO	LEMS GO
Full dataset (1995 - 2016)	0.85	1.00	0.44	0.50
2006 - 2016	0.10	-0.41	0.10	0.06
1997 - 2016	0.88	1.00	0.45	0.51

Table 3.3: EU KLEMS productivity growth estimates by CEPA

- 3.10 Another factor in arriving at an annual productivity challenge is consideration of productivity assumptions applied in recent price control decisions (regulatory precedent).
- 3.11 The table below shows the OE assumptions applied by various regulatory decision makers. Most have applied assumptions of or around 1% per year for opex and capex. The most recent decisions are at the top of the table.

Decision body	Year	Opex	Capex
Ofgem RIIO-ED2 Draft Determination	2022	1.2%	1.2%
CMA RIIO-T2/GD2	2021	1.05%	0.95%
UR NI Water PC21	2021	0.8%	0.6%
CMA PR19	2019	1.0%	
UR NIE Networks RP6	2017	1.0%	1.0%
UR Gas Distribution Networks GD17	2016	1.0%	1.0%
UR NI Water PC15	2014	0.9%	0.6%
Competition Commission – NIE RP5	2014	1.0%	1.0%
UR Gas Distribution Networks GD14	2013	1.0%	1.0%
Ofgem RIIO-T1/GD1	2012	1.0%	0.7%

Table 3.4: Recent regulatory decisions on annual productivity (%)

- 3.12 The most relevant precedent supports the UR position of 1% per annum target. The CMA found that Ofgem was not wrong in their application of

²⁴ Source: Excel workbook - CEPA, [Final] Ongoing Efficiency - Version 2 (30/11/20)

²⁵ "Targeted comparator set": (1997 - 2016) construction, wholesale and retail trade: repair of motor vehicles and motorcycles; transportation and storage; and financial and insurance activities

²⁶ "Economy-wide comparator set": (1997 - 2016) weighted average of all industries excluding real estate, public admin, education, health and social services.

such a target for GB gas companies. Most recently, Ofgem has consulted on 1.2% target for electricity DNOs. UR is therefore minded to retain the existing challenge.

GDN responses – EU KLEMS and labour productivity

- 3.13 Significant pushback was received from the GDNs in relation to productivity. PNGL stated that from the quantitative evidence alone, it appears that there is no case for a positive OE target at GD23.
- 3.14 Such a conclusion can only be reached by restricting data considerations to a limited period and gross (GO) rather than value added (VA) productivity. UR does not consider this approach to be the most appropriate.
- 3.15 In order to be consistent with the RPE approach, longer timeframes should make for the best estimates of the reasonable productivity challenge, after considering business cycles.
- 3.16 UR also sees merit in the VA analysis given availability of the data. In their report²⁷ for the Ofgem ED-II draft determination, CEPA has outlined a list of pros and cons with each approach, which reveals why both should be considered. Given that labour costs are the key component of expenditure for GDNs, it also seems reasonable that VA productivity should apply.
- 3.17 Like Ofgem, UR has considered different timespans, VA and GO estimates as well as labour productivity forecasts from the OBR. UR has also looked at productivity across all industries and against certain selected industries. Results would indicate that a positive OE target should be applicable.
- 3.18 UR further agrees with both CEPA and NERA that the EU KLEMS data may in fact underestimate achievable productivity. This is because of the fact that it does not account for ‘embodied’ technical change.
- 3.19 UR has updated the analysis and considered estimates using certain industries considered the most applicable data. Selected industries include those chosen by Ofgem for GD-II i.e. Construction (F), Wholesale & Retail Trade (G), Transportation & Storage (H) and Finance & Insurance (K).
- 3.20 UR has further including two industries that Ofgem has incorporated into the ED-II analysis. These include Info & Communication (J) and Professional, Scientific & Technical (M_N). The results are as follows:

²⁷ See RIIO-ED2: Cost Assessment – Frontier Shift methodology paper, p15, Table 2.2.

	TFP Value Added (2019 Release)		
	(1997-2016)	(2006-2016)	All years (1995-2016)
Unweighted Average of all Industries	0.05%	-1.05%	0.07%
Weighted Average of all Industries	0.88%	0.10%	0.85%
Unweighted Average of Selected Industries	0.51%	-0.49%	0.78%
Weighted Average of Selected Industries	0.62%	-0.24%	0.82%
Unweighted Average of Selected Industries*	1.10%	0.17%	1.20%

Table 3.5: EU KLEMS productivity VA growth estimates by UR

	TFP Gross Output (2019 Release)		
	(1997-2016)	(2006-2016)	All years (1995-2016)
Unweighted Average of all Industries	0.09%	-0.40%	0.10%
Weighted Average of all Industries	0.42%	0.07%	0.41%
Unweighted Average of Selected Industries	0.26%	-0.18%	0.39%
Weighted Average of Selected Industries	0.30%	-0.09%	0.39%
Unweighted Average of Selected Industries*	0.61%	0.17%	0.65%

Table 3.6: EU KLEMS productivity GO growth estimates by UR

- 3.21 When considering the additional industries (denoted by the *) it can be seen that even with the GO estimates, the long-term average is around 0.6% per annum. At the high end of the range, TFP estimates of 1.2% are possible.
- 3.22 PNGL commented that Ofgem’s selected window for measuring historical productivity placed excessive weight on high productivity gains achieved during the dot-com bubble of the late 1990s. This productivity growth is no longer relevant or likely to repeat itself during GD23.
- 3.23 In fact, the selected timeframes do not place excessive weight on high productivity years. They are given equal weighting along with the low productivity years. This approach is the same as that adopted for RPEs, even though the most recent price rises may not be repeated in the short-term. UR considers this the most justifiable and consistent approach.
- 3.24 UR has also looked at labour productivity as forecast by OBR.

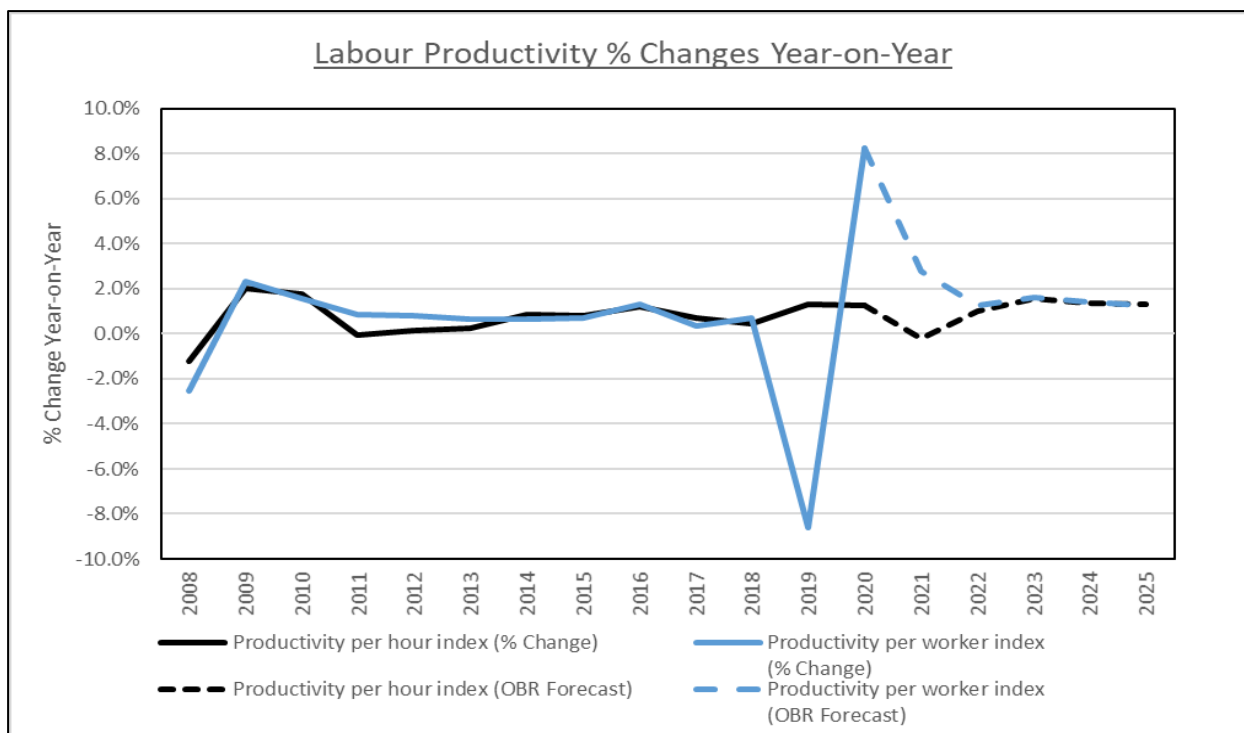


Figure 3.1: OBR labour productivity, % change

- 3.25 OBR is predicting labour productivity per hour to rise at an average of 1% per annum from 2021 to 2026. The figure is higher per worker, but hourly analysis is considered the more appropriate index in this instance. This is due to the impact of COVID-19 on the per worker index.
- 3.26 SGN also stated that it is incorrect for the UR to assume that the similar levels of productivity deemed relevant to GB GDNs are achievable in NI. As identified by Ulster University in a May 2019 report, 'productivity levels in NI are still more than 15 percent below the UK average'.
- 3.27 It is true to state that productivity has long been lower in NI than that achieved in the UK. This however is not an argument for reducing the OE challenge for NI GDNs. Given the lower starting point, a case could be made for a tougher target. The key issue however is the rate of change.

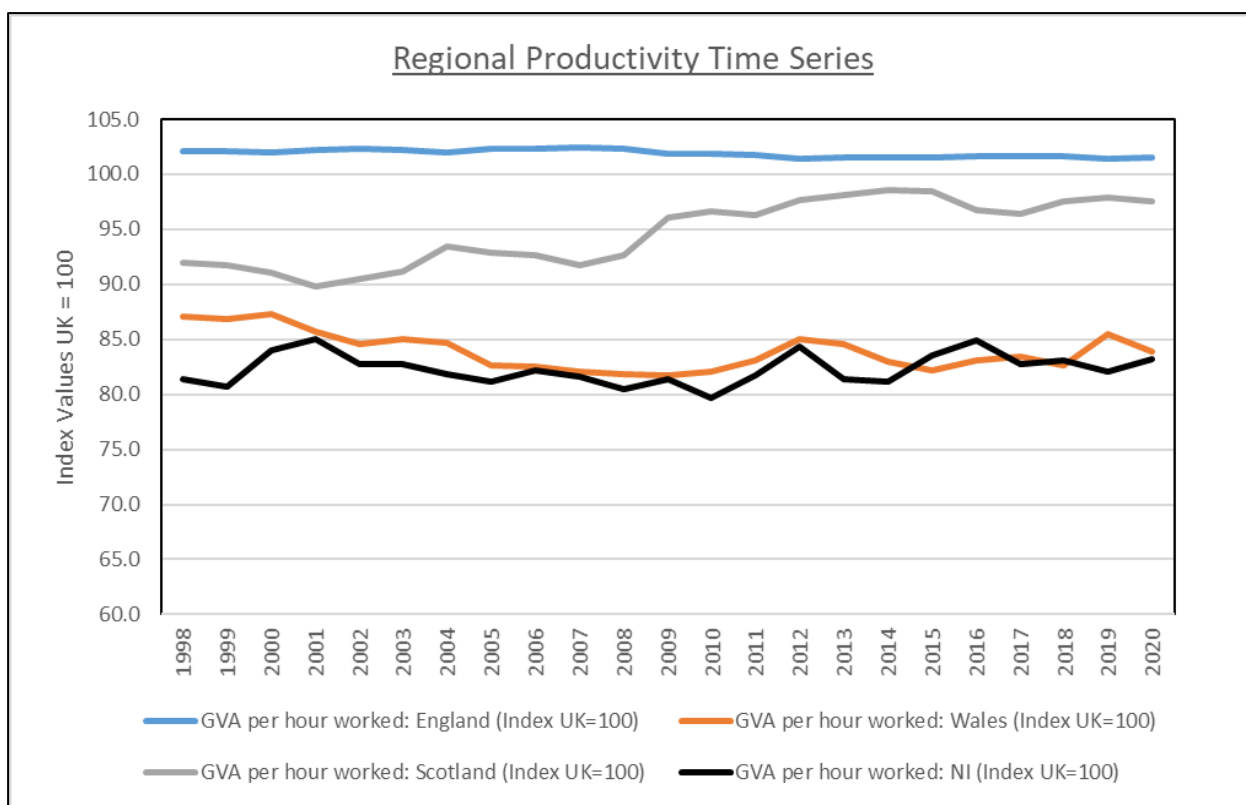


Figure 3.2: GVA per hour worked by region – ONS data

- 3.28 Whilst a material gap remains, NI productivity has marginally caught up with the UK since 1998. Productivity has increased faster than both England and Wales but lags behind Scotland. This suggests that the OE challenge applicable to GB should also be replicated in NI or even increased.
- 3.29 Based on the quantitative evidence from both EU KLEMS and OBR labour productivity, the UR considers that the 1% challenge remains appropriate.

GDN responses – achievability

- 3.30 Both SGN and PNLG further questioned the fact that UR had not sought to include any evidence on whether this OE target is achievable in the specific context of GD23. PNLG pointed out that this price control is different in both time and geography from RIIO-GD2. SGN also provided a list of reasons why they should receive preferential treatment.
- 3.31 In response, UR would state that OE targets are applicable to even the most efficient companies. It is for the GDN to establish why they could not be achieved in an NI context. Whilst there is a timing difference between GD23 and GD-II, it is notable that Ofgem are consulting on a 1.2% totex target for the ED-II draft determination. This suggests that the 1.0% per annum challenge by the UR is still applicable.

- 3.32 For SGN, it could be argued that a company in its relevant infancy has a greater scope for efficiency improvement, assuming that optimum working practices are achieved with time and experience.
- 3.33 Many of the issues SGN raised would also seem to point to the possibility of a higher level of efficiency being feasible, particularly as the GDN expands activity. SGN has also raised the issue of contracting which is within management control. These factors do not represent a good rationale for reducing the efficiency challenge.
- 3.34 UR challenge is not that materially different from Firmus business plan proposals. It is difficult to understand why SGN and PNGL should be so much lower than Firmus who operate in similar conditions.
- 3.35 PNGL also referenced the small size of the NI companies relative to the GB GDNs. Their conclusion was that they might have more difficulty in achieving scale efficiencies. This was considered a challenge both in comparing the static level of efficient costs and the change in efficient costs.
- 3.36 From the UR perspective, small size may present a challenge when benchmarking static costs, though this can be adjusted for using different methodologies. However, it is not clear why this would affect the rate of change of efficient costs or labour productivity.
- 3.37 PNGL also argued that as a much newer business than GB GDNs it has fewer baked-in inefficiencies that it can address. UR would highlight that the OE challenge represents improvement at the frontier, which is expected of even the most efficient companies. UR has not imposed any catch-up targets on the GDNs, so is content that the existing OE target is appropriate.
- 3.38 Both SGN and PNGL stated that given the current circumstances, it is not appropriate for UR to “aim up” in the range of available evidence. Likewise, Firmus stated that the UR proposal on productivity adjustment is likely to be beyond the top end of the achievable range over the GD23 period.
- 3.39 Whilst the targets are towards the top of the evidence range, UR does not consider the challenge to be “aiming up”. This seems particularly pertinent given the most recent Ofgem proposals of 1.2% per annum totex efficiency challenge suggested for electricity DNOs in 2022. Whilst the UR could potentially have imposed more stretching OE targets, it has not chosen to do so for the final determination.
- 3.40 Firmus considered that the Utility Regulator should take account of the following factors:
- A structural productivity slowdown in the UK since 2008, and

- The impact of the COVID-19 pandemic on the potential for productivity growth.

3.41 UR can confirm that both these issues are reflected in our analysis in terms of the data reviewed. However, the review has not been limited to detail post 2008. UR has also taken the latest OBR forecasts of labour productivity into consideration. These account for both of the issues raised and still project labour improvements at an average of 1% p.a. per hour worked.

GDN responses – regulatory precedent

3.42 PNGL also questioned the precedent relied on by the UR. They commented that the CMA did not “endorse” any element of Ofgem’s approach – it simply concluded that the core OE selected by Ofgem was within the realms of regulatory precedent.

3.43 Of the Ofgem precedent, PNGL also argued that three companies in the comparator set are not relevant because they are all transmission companies, and two of them are electricity transmission companies. Thus, they all face very different cost structures than a GDN.

3.44 PNGL is correct to highlight that the CMA review is not an explicit endorsement. NERA also correctly points out that, *“it simply concluded that the core OE selected by Ofgem was within the realms of regulatory precedent and not inconsistent with the evidence reviewed by Ofgem in the round.”* UR agrees with this assessment and has adopted a similar approach in coming to a final productivity challenge.

3.45 The GDN is correct to detail the actual OE figure as clarified by the CMA referral. However, UR does not agree that other comparators are not relevant because of the different cost structures. Given similar activities in terms of construction, maintenance and compliance, gas and electricity DNOs / TSOs provide useful indicators as to the level of OE achievable.

3.46 PNGL further stated that SPT’s business plan likely includes some catch-up efficiency and NGET and NGGT’s OE submission was on an opex basis, which is a relatively small part of their cost base. On a totex basis, the equivalent figure is 0.4% for NGET.

3.47 It is unclear to the UR if catch-up efficiency is included in the SPT business plan. Whilst the 0.4% figure was detailed in the CMA referral for NGET, Ofgem has indicated that ENWL included a 1% OE assumption for totex in their business plan.²⁸ This would lend further precedent support from a regulated electricity distribution company for the UR target.

²⁸ See RIIO-ED2 Draft Determination, p364, para 7.460

Productivity Conclusions

3.48 Given the updated analysis and review of GDN responses, UR is not minded to amend the productivity target. This has been retained at 1% per annum for both opex and capex.

	Opex	Capex
Productivity change	1.0%	1.0%

Table 3.7: GD23 productivity target (%) at final determination

3.49 It is the UR view that this target is supported by both the quantitative evidence and regulatory precedent.

4. Frontier shift conclusions

4.1 The respective net impact of frontier shift for both opex and capex is shown in Table 4.1 and Table 4.2 below. Please note numbers may not sum due to rounding.

Figures in %	GD17		GD23					
	2021	2022	2023	2024	2025	2026	2027	2028
Weighted nominal input prices	6.9	7.8	4.5	2.7	2.8	3.1	3.1	3.1
CPIH	(2.5)	(8.0)	(5.6)	(2.3)	(1.1)	(2.1)	(2.1)	(2.1)
Productivity	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)
Frontier shift (annual)	CPIH +3.2	CPIH -1.2	CPIH -2.0	CPIH -0.6	CPIH +0.6	CPIH -0.1	CPIH -0.1	CPIH -0.1
Cumulative frontier shift	3.2	2.0	-0.1	-0.7	-0.1	-0.1	-0.2	-0.2

Table 4.1: Opex frontier shift calculations

Figures in %	GD17		GD23					
	2021	2022	2023	2024	2025	2026	2027	2028
Weighted nominal input prices	6.9	17.0	4.5	2.7	2.8	3.1	3.1	3.1
CPIH	(2.5)	(8.0)	(5.6)	(2.3)	(1.1)	(2.1)	(2.1)	(2.1)
Productivity	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)
Frontier shift (annual)	CPIH +3.2	CPIH +7.2	CPIH -2.0	CPIH -0.6	CPIH +0.6	CPIH -0.1	CPIH -0.1	CPIH -0.1
Cumulative frontier shift	3.2	10.7	8.5	7.8	8.5	8.4	8.4	8.3

Table 4.2: Capex frontier shift calculations

4.2 In the GD23 period, the impact of the decisions is a slight reduction to opex allowances. For capex, there is a rather material uplift.