Annex 7.2
Financing

Northern Powergrid: our business plan for 2023-28

Contents

Introduction

This annex presents additional detail on three areas, some of which is aimed more at expert financial stakeholders, but all of which we have tried to keep as accessible as possible for any wider stakeholders with an interest.

These three strands are:

- The cost of capital in the settlement – which is one of the single most important variables to customers and investors alike, but one which can become very technical.
- How costs are spread over time – which is again a complex subject, but where the messages for customers are more straightforward.
- Bill impacts – where we supplement the domestic bill impact figures in our plan with bill impacts for some further representative groups.

A further annex (credit metrics), presents related information on financial projections, credit metrics and risk management – where we present the evidence which makes us conclude that taking Ofgem's modelling assumptions for the notional company, the base case give an implied rating with Moody's, as calculated within Ofgem's model, of Baa3 fo Northeast and Ba1 for Yorkshire. This shows the Moody's rating is non-investment grade.

Cost of capital

The cost of capital is the cost to companies of raising finance. Like any other cost that regulated companies incur it needs to be remunerated, and indeed our regulator has a duty to ensure companies can finance the cost of all their activities – including financial as well as physical costs.

The allowed return on capital, and in particular the allowed return on equity, is also Ofgem's incentive to companies to invest. Since investments in vital infrastructure like electricity distribution networks underpin the functioning of a lot of society, it is very important for our regulator to set it a high enough (but still appropriate) level.

Companies can raise finance in different ways, with debt finance being one option, and equity finance being a second (and much more flexible but also more expensive) option. The overall cost of capital is the weighted average cost of using a blend of these two types of finance.

- We set out more on the cost of equity, and the cost of debt, in the first two sub-sections below.
- The blend of these two, known as financial gearing, or the equity ratio, is covered in the third sub-section.

Cost of equity

As set out in the finance section of our plan, Ofgem's current working assumption for the cost of equity, of 4.65 per cent[1] plus CPIH inflation[2], is too low. It is below the marginal cost of equity and risks deterring investment in the distribution network at a time when the need for investment is acute.

The cost of equity itself can't be observed directly, and has to be estimated indirectly. This makes it much more technically complex than estimating, say, the cost of debt – where it is possible to see the interest rate on the debt that companies have actually issued.

[1] Comprised of Ofgem's working assumptions of 4.4% for the allowed return plus 25 basis points for expected incentive returns.

[2] Inflation measured using the consumer prices index including owner occupiers' housing costs

Because it is a technically complex subject, we along with other Distribution Network Operators (DNOs) have commissioned an expert report on the cost of equity. This report is intended for expert stakeholders, and is included with our plan as annex 7.3, 'Oxera study; The cost of equity for RIIO-ED2'.

Lying behind Ofgem's too-low cost of equity are several under-estimated parameters

The cost of equity is typically calculated by estimating several underlying parameters, then calculating an overall value based on a financial model known as the capital asset pricing model (CAPM). This is the main approach used by Ofgem (supplemented by several purported cross checks) and therefore, to understand the faults in Ofgem's estimate, it is necessary to look at each parameter in turn.

The following table sets out Ofgem's working assumption for each of these parameters, along with the range provided by Oxera's report, and our view in summary – including points that support our statement in our main plan finance section that Ofgem's approach does not match the methodology taken by the Competition and Markets Authority (CMA) in its recent re-determination for water utilities.

Oxera's report sets out a much more detailed evaluation of each issue and should also be referred to by stakeholders who are expert in this area and want to fully understand the issues.

	Ofgem working assumption	Oxera range	Our view
Total market return	6.5%	7.0% - 7.5%	Ofgem's estimate of the total market return is too low; most of the reduction is because Ofgem has changed how it interprets historical information on inflation. This has meant that, even though Ofgem is switching from RPI to CPIH inflation, which is about 1% lower, its estimate of the total market return stripped of inflation hasn't risen, as it logically should have done. The CMA has recently partly-recognised these issues and used a value of 6.81% in its re-determination for water utilities.
Risk free rate	-1.16%	-0.93%	Ofgem has based its estimate of a risk free rate on government gilts, which no corporate entity can access, for example, because the government rates are lower on account of convenience and money like properties that simply don't exist for corporate debt. The CMA recently recognised these issues by placing some weight on the highest quality corporate debt in its assessment of the risk free rate for water utilities giving higher values than Ofgem's methodology would deliver.
Equity beta at 60% gearing	0.76	0.85 – 0.93	Ofgem first needs to stop using estimates of systematic risk from the water sector, or from energy networks in Belgium. Its starting point for GB energy networks should be estimates of systematic risk from those networks, such as Scottish and Southern Energy (SSE) and National Grid. Oxera's work does use a sample of European energy networks to supplement these estimates, but it is more representative than Ofgem's European sample.

	Ofgem working assumption	Oxera range	Our view
Post tax cost of equity	4.65% plus CPIH, based on the mid-point of its CAPM range	5.81% - 6.87%	Ofgem's current working assumption is below the marginal cost of equity and risks deterring investment in the distribution network at a time when the need for investment is acute. The potential costs to customers of running the risk of deterring investment in this way are widely accepted to be material - and have been recognised by the CMA in its recent re-determinations by the CMA choosing a point estimate 25 basis points above the middle of its range (in a sector which does not face the additional imperative for investment to underpin the net-zero transition, and the associated higher costs of underinvestment).
Ofgem cross checks	Confirms CAPM estimate	Ofgem's cross checks are flawed. An alternative cross check based on the differential between the asset and debt premium could be given some weight.	The cross checks Ofgem has used do not add anything to CAPM. Some of them depart from key assumptions, which makes them theoretically novel and unsupportable. Others, like estimates based on water company traded values, do not give reliable estimates. In this example the traded companies are all regarded as top-performers (who were "fast tracked" by their regulator) and so it is difficult to separate the valuation of high operational performance from the underlying assets.

Table 1: Cost of equity - analysis of underlying parameters

Ofgem's proposed initial deduction for expected returns from incentives is not appropriate

Our regulator had also proposed to make a deduction from allowed returns on account of purported expected outperformance in the rest of the price control settlement. It had not proposed a calibrated value for electricity distribution, although in its 2020 determinations for transmission and gas distribution it reduced its estimate of the cost of equity by 25 basis points to reflect this. This would be given back to those networks companies if they don't outperform.

We do not think this would be appropriate.

- Firstly, from a practical point of view there is a longer track record of existing incentives in the electricity distribution, with more data available on likely performance. This means that there is no reason to think that the regulator will not be able to set challenging targets.

- Secondly, reducing the headline cost of equity is the wrong response, even if Ofgem thought companies would outperform a particular incentive. The cost of equity is in effect Ofgem's incentive for companies to invest, and distorting it downwards sends a damaging signal.

- Thirdly, it creates a dead-band in which there is no incentive to improve performance.

The CMA has also recently found that Ofgem was wrong to apply this type of deduction to the transmission and gas distribution sectors, following price control appeals by the affected companies.

Cost of debt

Ofgem will set our cost of debt using its established policy, of an index recalibrated at the price review

Over the last twenty years, the cost of the debt that network companies have used to finance their business has fallen significantly. The extremely low cost of issuing new debt over the last decade has continued this trend.

These savings have been passed on to customers, and they have therefore saved a lot of money. Ofgem now does this through an established policy of setting a trailing average to cover the expected debt costs of the sector over the forthcoming period, including all of the costs (such as insurance costs, not just the coupon).

The index is then updated for actual data, to reflect the market conditions actually experienced. Therefore customers will see their bills updated within the period as these change – meaning allowances could fall or rise depending on what happens, but always in a way that reflects the financial costs the sector is actually incurring, and based on a trailing average that recognises the cost of long-term fixed rate debt issued over the last circa two decades.

The allowance needs to reflect all the costs of borrowing, not just the headline debt interest rate

Our regulator has set a working assumption for 2023-28 of a 17 year trailing average of a particular index of debt costs[3] plus 25 basis points to reflect additional costs of borrowing. We already worked with our regulator and other network companies to help develop the evidence supporting this estimate of the additional cost of borrowing. It was used in the transmission and gas distribution price controls, and we will continue to work to help Ofgem develop this evidence base supporting it.

There are also additional debt costs associated with smaller issuance sizes

Northeast and Yorkshire may incur additional costs of debt funding, compared to Ofgem's base assumption, because they are relatively small compared to companies like National Grid Electricity Transmission.

Ofgem's policy at the last gas distribution price review was to allow 6 basis points in additional costs for licensees that met its threshold, based on Ofgem's assessment of the associated costs. Our initial view is that we will meet this threshold, although we and Ofgem will review this once Ofgem finalises all aspects of its settlement through its draft determination process.[4]

While there are wider options for exactly when debt costs are remunerated

Ofgem policy is currently to set a debt allowance in real terms. This means each year's revenue is set at a lower level than the interest actually paid on nominal debt; and the difference is added to the regulatory asset value to be paid for by future customers.

This is not the only approach that can be taken, and we consider one potential alternative option in the section below on how costs are spread over time.

[3] The iboxx 10+ year utilities index

[4] The figures presented in our business plan for Ofgem's view do not depart from its requirement to use its working assumption for the cost of debt.

Equity ratio

The proportion of equity finance used in financing the regulatory asset value (RAV) is an important consideration for investors. If companies make use of more equity funding they have less debt and this makes them financially more robust to risks, which will help reduce the cost of equity (all else held constant). Higher gearing exposes equity investors to more risk and raises the cost of equity. Credit rating agencies will also score companies that have lower gearing more highly.

For the purposes of this plan, we have assumed that the price control will include a 40% equity ratio assumption, in line with Ofgem's working assumptions for the cost of equity. Annex 7.5, credit metrics, sets out more detail on the factors we considered in this decision, the resulting credit metrics at a 40% equity ratio, and a set of credit metrics based on our actual equity ratio (which is higher).

How costs are spread over time

Our plan for 2023-28 involves significant additional investment to open up all the credible pathways for decarbonisation.

As we highlight in the finance section of our plan, about 70 per cent of our core expenditure relates to long-lived equipment, and isn't paid for immediately because it is instead added to our "regulatory asset value" (RAV), and then paid for over time through "regulatory depreciation" of the RAV.

How these costs are spread over time is very important to future customers, such as children at primary school at the moment. This part of the finance annex explains more about why and how we think Ofgem should change how costs are spread over time.

Charges today are a consequence of past decisions on how to spread costs over time – and decisions today will also affect future customers

Network Charges today do not depend only on our costs today. They also depend on the size of the RAV that has been built up over time, which depends in part on previous decisions on how to spread costs over time. In the past, our regulator chose to spread costs over a relatively short period of time. This meant that charges were higher than they could have been. But those charges were still quite low, because the starting RAV, which was established a few years after privatisation of the sector, in the mid-1990s, was set at a lower level than the full value of the assets. Overall electricity distribution customers were still able to pocket a substantial saving from the combined policy. So it was not unfair, in any way.

Because previous customers paid for fast regulatory depreciation, they preserved the discount they were enjoying for today's customers – who are now enjoying discounts as a result.

Decisions taken today can affect future customers in a similar way. If costs are spread over a short period of time, all customers can continue to benefit from these policies having been maintained over time. If relatively long regulatory depreciation lives are used, costs will be loaded unfairly onto future generations.

Electricity distribution customers have always benefitted from a discount thanks to "fast" regulatory depreciation

The chart below shows the discounts customers in Great Britain have benefitted from, since the first price controls were in place, thanks to paying for the costs of investment relatively quickly.

The calculation is based on an estimate of what customers would have paid if the cost of investments had always been spread over 45 years, rather than the actual policies which were used until 2015 (which eventually settled on spreading the cost over 20 years). The chart also shows what had originally been set to happen during 2015-23 and 2023-28 (if the pre-2015 regulatory depreciation policy had remained in place for "business as usual" levels of expenditure).

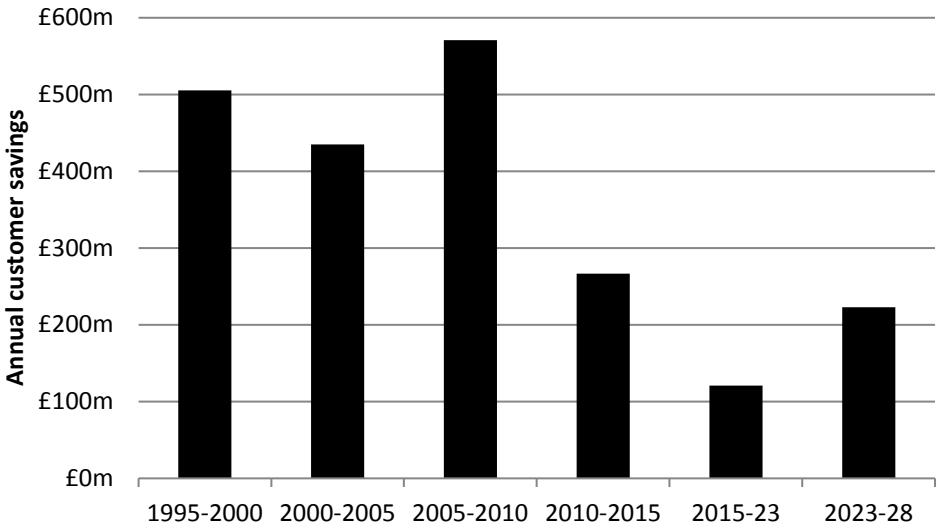


Figure 1: Discounts provided to customers in Great Britain thanks to "fast" regulatory depreciation

This means that customers over 2023-28 can help to pay for more of the net zero challenge

As we explain in our plan, ten years ago Ofgem decided to increase the regulatory depreciation period from 20 years for investments made in 2014 to 45 years for investments made from 2023 onwards.

This will have the effect of reducing how much of the net zero challenge that customers pay for over the 2020s and also of storing up significant additional costs for future customers.

We think this outcome is unfair. It would amount to us all agreeing that there is a need to invest in the decarbonisation journey, but relying on the next generation to pay for most of it whilst we take a payment holiday.

It also doesn't need to be the case. As we show in the chart above, customers today are already receiving a good deal.[5] This means that they start from a position where they can keep chipping into the pot, like customers did in the 1990s through to 2015, in order to help make sure future customers can continue to benefit from the same discounts customers enjoy today.

Public policy considerations have also led HM Treasury to the same conclusion for net-zero in general

The Government's net zero review, undertaken by HM Treasury, has recently concluded the same thing based on a completely separate, bottom up, review of the public policy issues around funding net-zero costs.

> *"Seeking to pass the costs [of net zero] onto future taxpayers through borrowing would deviate from the polluter pays principle, would not be consistent with intergenerational fairness nor fiscal sustainability, and could blunt incentives. This could also push up the economic cost of the transition"* [6]

[5] Relative to where charges would be if customers in the past hadn't kept paying for assets relatively quickly.

[6] HM Treasury, October 2021, Net zero review – analysis exploring the key issues, executive summary, page 8.

Ofgem's policy of 45 year regulatory depreciation in electricity distribution goes further than HM Treasury concludes would be wrong. Not only is Ofgem weighting the cost of the net zero transition on future generations, it is at the same time shifting the cost of business as usual investment away from the current generation, and onto future generations. This completely hides the cost of the net-zero transition, and makes for a double whammy for future electricity distribution customers – the children of today – either element of which would be manifestly unfair.

And as the HM Treasury review also points out, in addition to being intergenerationally unfair Ofgem's policy also means that:

- today's polluters, who have enjoyed all the benefits of a fossil fuel powered economy, won't pay (their children will instead)
- incentives could be blunted; and
- the overall economic cost of the transition could be increased.

A shorter regulatory depreciation period would make the sector more stable over the long term

Under Ofgem's current policy, the investability of the sector will also dramatically decline over the long term.

The impact on equity metrics illustrates this point well. As we head through the 2020s and into the 2030s, the sector's net income would decline year on year under 45 year regulatory depreciation, driving the return on book equity towards zero. Ofgem would then be locked into long-term price rises, ultimately leading to a period in which returns on book equity rise to around 15 per cent, even at low allowed regulatory returns, creating enormous scope for public and political pressure on the regime (and in turn raising the cost of equity). This is simply unsustainable.

The solution is straightforward, has obvious regulatory precedent, and would clearly be in the interests of current and future consumers taken together

To support intergenerational fairness, and create much needed financial headroom to help fund any major increase in investment for the low carbon transition, Ofgem should:

- set the asset life for business as usual levels of investment at the current average (about 25 years); and
- re-consider whether it needs to use the longer 45-year asset life, for any significant additional investment, in light of the findings of HM Treasury's analysis of net zero issues.

These steps alone will take too long to fully address the issues. So our regulator should also identify further steps it can take to spread charges fairly over time, such as moving to a nominal allowance on the cost of debt, or accelerating "backlog" regulatory depreciation from 2015-23 during the 2023-28 period.[7]

This would be inter-generationally fair as it ensures that:

- future (as well as current) customers benefit from a historically small asset base, allowing these savings to offset some of the costs of the low carbon future; while
- any big increase in investment can still be spread fairly over time (which might involve current customers paying for them under accelerated depreciation, in line with HM Treasury's findings as to the balance of intergenerational fairness).

And there would be many other advantages to this approach:

[7] The customer bill impacts for our view of our plan assumes that debt costs for the notional company are funded in line with the debt rates that are actually paid, i.e. 75 per cent on a nominal basis and 25 per cent on a real basis.

- It would help maintain company cashflows so they can respond when investment is needed, whenever that might be.

- It would ensure Ofgem is not trapped by the strained cashflows that uniform 45 year asset lives will create through the late 2020s and into the 2030s, assuming that major additional investment is needed in that window.

- And it would reduce the inevitable upwards pressure on the cost of capital that would be caused by a significantly larger RAV in the future.

Our plan takes a simple and stable approach to the capitalisation rate

The other aspect of how costs are spread over time is the capitalisation rate. This is the proportion of our capital and operational expenditure (or totex costs) which are added to the RAV repaid through regulatory depreciation. Those cost allowances which aren't added to RAV flow immediately into our allowed revenue.

As set out in our plan, it uses a 71 per cent capitalisation rate.[8] This means that for every £1 of totex allowances that we spend, 71p will be added to the size of our financial investment (RAV additions), while 29p will be charged immediately to customers through our allowed revenue in the same year. This assumption is set to maintain a consistent policy with the current price control period and reflect the 'natural' long term rate. It also has the benefit that it avoids compounding the intergenerational fairness problem that Ofgem's regulatory depreciation policies have created.

Customer bills

As explained in the financing section of our business plan, most of our customers will never see a bill from us. Instead they receive a much larger bill from an electricity supplier that charges for everything – including distribution costs, but also every other cost involved in getting electricity to them.

Our main plan presents bill impacts for our proposals using the example of a domestic customer. We focussed on these customers because domestic customers are our largest customer group by number, by a large margin, accounting for approximately 3.9 million metered connections. They also pay approximately 45 per cent of our charges and consume 35 per cent of the electricity we distribute, contributing the largest share of our revenues out of any customer group.

We have many types of customer, and this annex shows the bill impact for a representative selection

We also have many other types of customer, besides domestic customers. Most of these fall into one of three broad categories:

- approximately 250,000 commercial customers e.g. shops, bars, restaurants and other small and medium sized businesses;

- approximately 30,000 industrial customers e.g. large factories; and

- approximately 2,000 generation or unmetered customers (predominantly local authorities for street lighting).

Around 40 per cent of our charges are paid by industrial customers who consume 50 per cent of the electricity we distribute and 15 per cent by other customers who consume about 15 per cent of the electricity we distribute.

In this annex we reproduce the domestic bill impact set out in our main plan, and complement this with the bill impact for the average customer in a number of other customer groups. There can be a much wider range of bills across our

[8] Average across licensees, which are respectively 1 percentage point higher or lower.

non-domestic customers, since they range from small commercial premises to large factories, and can be connected at different voltages, so we have presented the bill impact for:

- The average domestic customer, who is set to pay about £90 a year in 2022-23.
- The commercial customer equivalent of a domestic customer i.e. the average small business, with 2022-23 bills of about £400 a year.
- The average larger customers connected at low voltage with site specific charges, at about £5,000 a year.
- The average of our much larger customers who are connected at high voltage with site specific charges, at about £50,000 a year[9].

As in our main plan we present this breakdown of the bill impact in two ways:

- using the working assumptions that Ofgem has required us to use; and
- under our proposed financial parameters, with an appropriate cost of equity and addressing the issues surrounding regulatory depreciation loading extra costs onto future generations.

Although the relative size of the bills might vary, the proportionate impact is the same as for domestic customers

The two panels of bill impact charts are shown below. The key point from these charts is that, although the scale of the bill varies depending on the customer group considered, the proportionate impact of our proposed plan is the same.

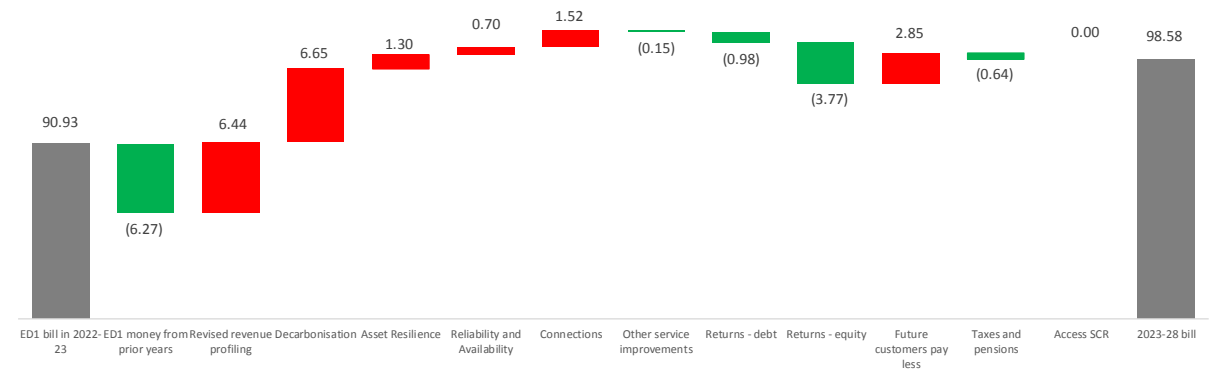
- Under our proposed plan, which strikes a fair balance for customers in the future (and also for shareholders), bills will rise by £8 at the start of the 2023-28 period.[10]
- Under Ofgem's proposals they will rise by £1 – but in order to achieve this moderated increase, higher bills will be unfairly loaded onto future customers; including the children and grandchildren of today.

[9] We have not included our largest industrial customers who have individual customer tariffs as this could distort the average.

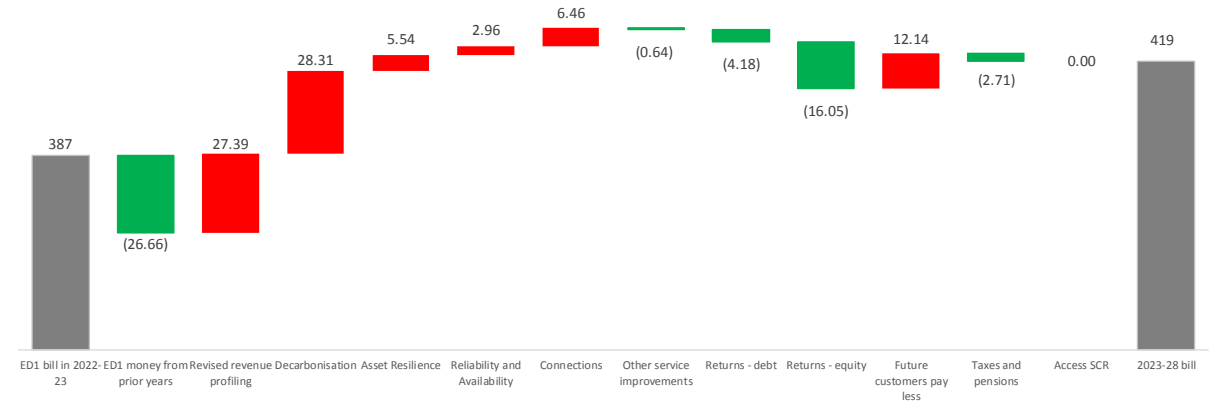
[10] The bill impacts presented here are on a comparable basis to our July 2021 plan, which used the inflation assumptions set out in Ofgem's March 2021 publication of the Sector Specific Methodology Decision. We have also set out in the appendix the bill impacts based on the inflation assumptions Ofgem provided in its financial model at 1 December 2021.

Our view of bill impact (£, 2020-21 prices)

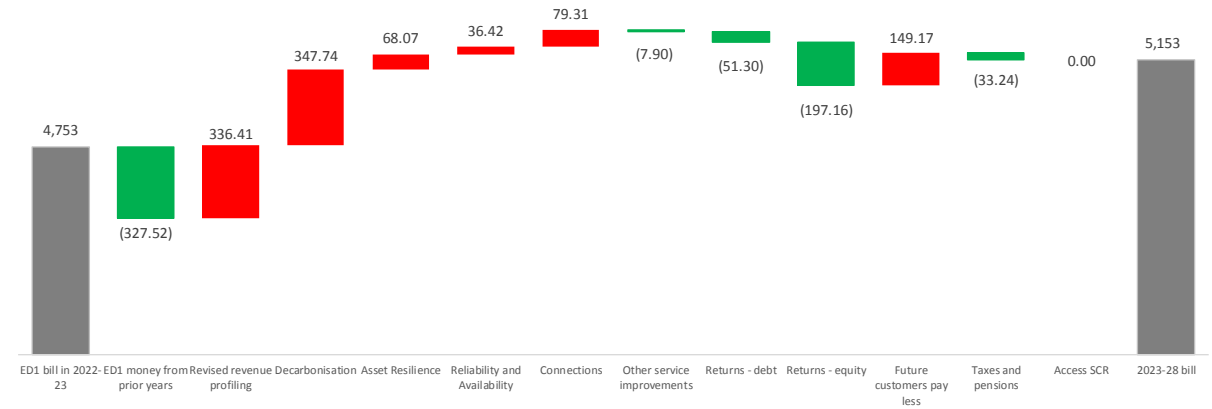
Domestic customer



Non-domestic customer



Low voltage site specific charge customer



High voltage site specific charge customer

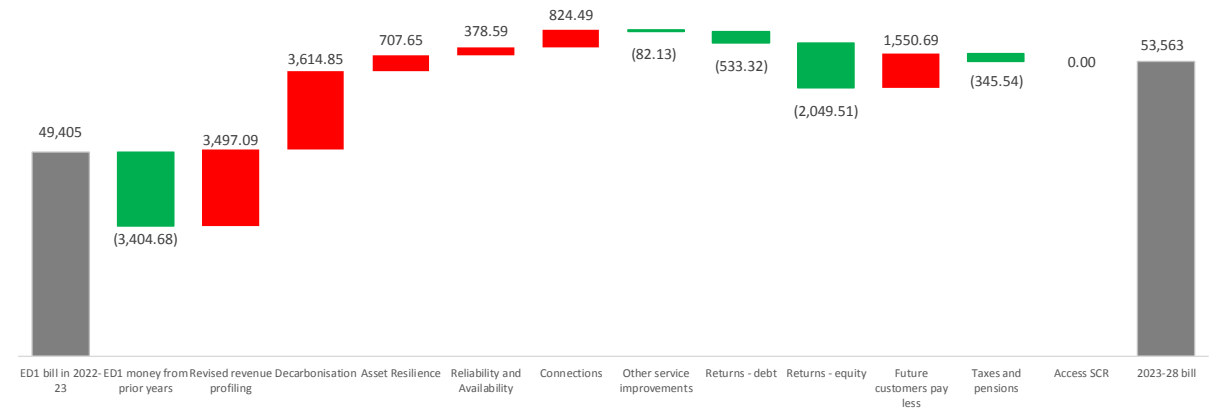
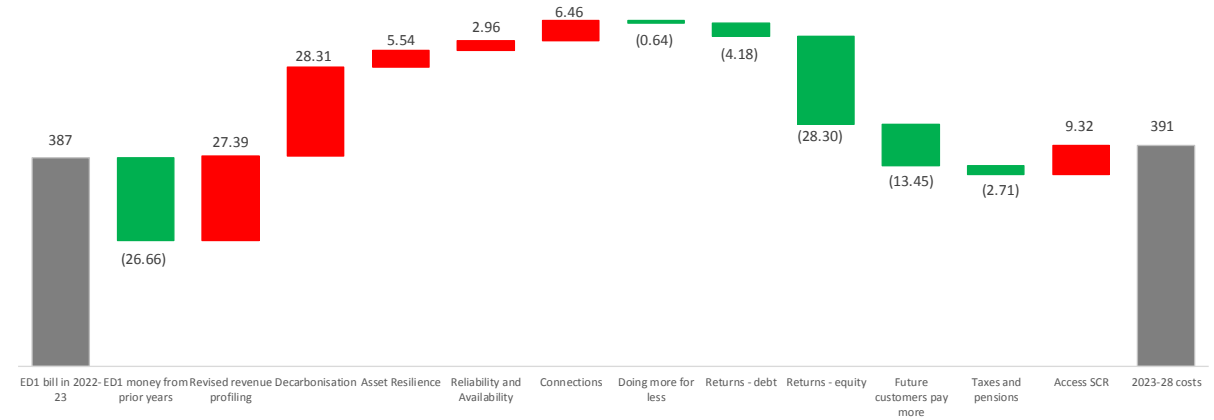


Figure 2: Bill impacts using our view of financial assumptions

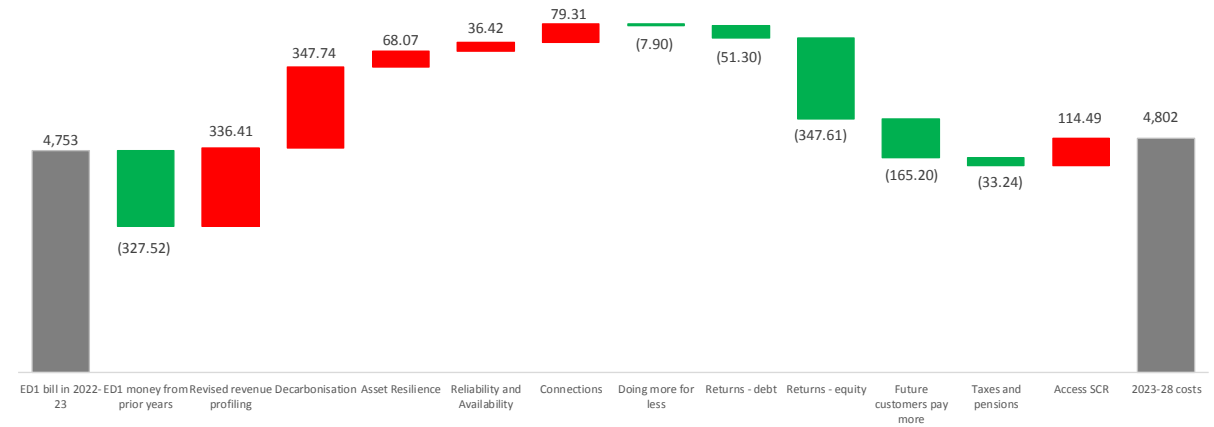
Ofgem view of bill impact (£, 2020-21 prices)

Domestic customer

Non-domestic customer



Low voltage site specific charge customer



High voltage site specific charge customer

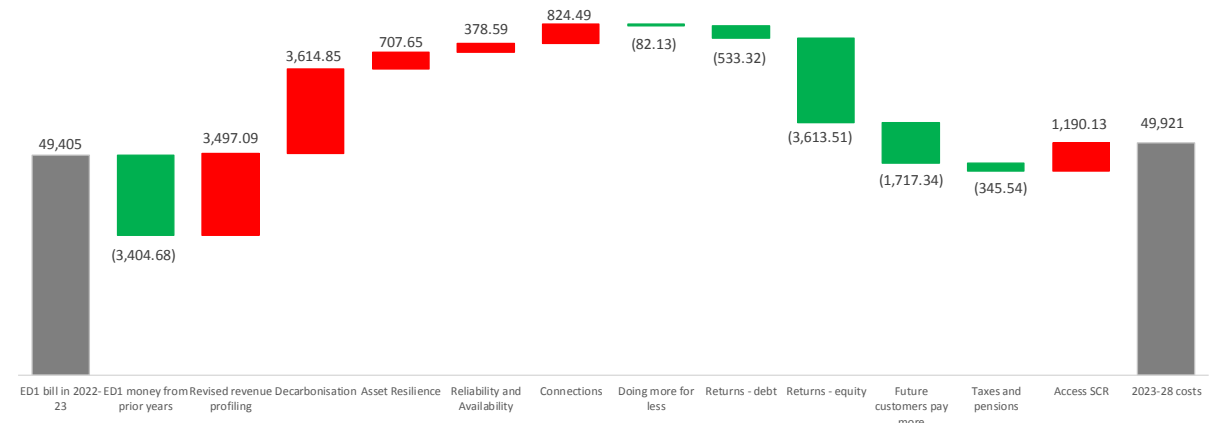


Figure 3: Bill impacts using Ofgem's view of financial assumptions

The key differences between our plan and Ofgem's working assumptions are how charges are spread over time, the cost of capital and how connection charges are set

The table below shows where the differences arise between the bill impacts based on Ofgem's working assumptions and our plan. These bill impacts (and the ones in our main plan document) are based on our planning scenario view of costs over 2023-28. This is higher than the baseline allowances we request in this plan, as it also includes those costs we currently expect would be funded through uncertainty mechanisms. If the outcome of those uncertainty mechanisms were different to our expectations, then cost allowances and hence the bill impact would vary – for example if less cost allowances were provided through uncertainty mechanisms than our best view, the bill impact would be lower.

	2015-23	2023-28	
		Ofgem's working assumption	Our plan
Real cost of equity	6.0%	4.65%	Above 5.8%
Real cost of debt	2.03%	2.09%	2.09%[11]
Nominal funding for debt costs	None applied	None applied	75% of debt costs
Equity ratio	35%	40%	40%
Inflation	RPI at 3.1%[12]	CPIH at 2.0%	CPIH at 2.0%
Nominal cost of capital	6.5%	5.18%	5.57%
Regulatory depreciation	Transition to 45-years	45-years	Underlying spend: 25 years Incremental spend: 45-years[13]
Tax rates	20%	25%	25%
Pensions	£22m pa	£8m for one year	£8m for one year
Connection charges (Access SCR)	Established policy	Access SCR minded to position (customers in general pay for more of the cost of new connections)	Established cost-reflective policy retained

Table 2: Differences in financial assumptions

All of the differences between Ofgem's working assumption and our own view that relate to financial parameters – in the first, third, sixth and seventh rows in the table above – are explained earlier in this annex.

The final difference relates to how connection charges are set. Ofgem is currently reviewing its policy in a process called the Access SCR. Its proposals in this area are to make connection charges less cost reflective, and spread a greater proportion of the cost of new connections onto customers in general (including future customers). This means that:

- Current and future customers will cross-subsidise the cost of new connections for many new developments.
- Incentives for developers to connect where it is cheapest to do so will be blunted, raising overall costs.
- A large part of the cost of these new connections will be deferred to future generations, which is inter-generationally unfair.

We instead think Ofgem should retain its existing cost-reflective connection charge policy. More detail is set out in our annex on the Socialisation of Costs: Access SCR and Net Zero Service Upgrades.

[11] Ofgem's policy on the cost of debt for smaller licensees implies an additional allowance of 6 basis points for licensees which meet certain threshold criteria. We expect Northeast and Yorkshire would meet these thresholds but, since this does not necessarily represent a difference of view between us and our regulator, we have reflected its working assumption.

[12] Ofgem working assumption at the last price review for the 2015-23 period.

[13] The conclusions of the HM Treasury analysis of net zero issues imply that faster depreciation on incremental net zero expenditure would also be warranted.

Appendix 1: impact of alternative inflation assumption

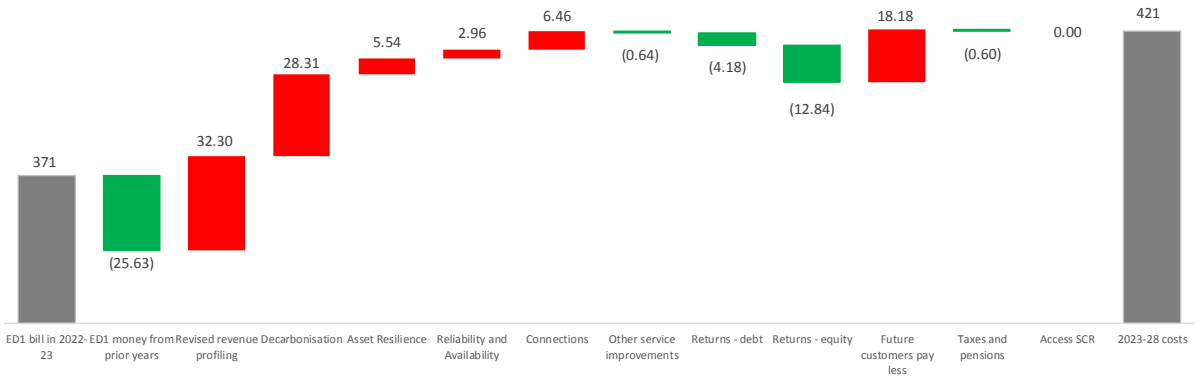
Ofgem's financial model at 1 December 2021 uses an alternative inflation assumption to the working assumption set out in Ofgem's Sector Specific Methodology Decision (SSMD).

This annex sets out the impact of using this alternative inflation assumption on our bill impacts, both under Ofgem's view and under our view of the appropriate financing parameters.

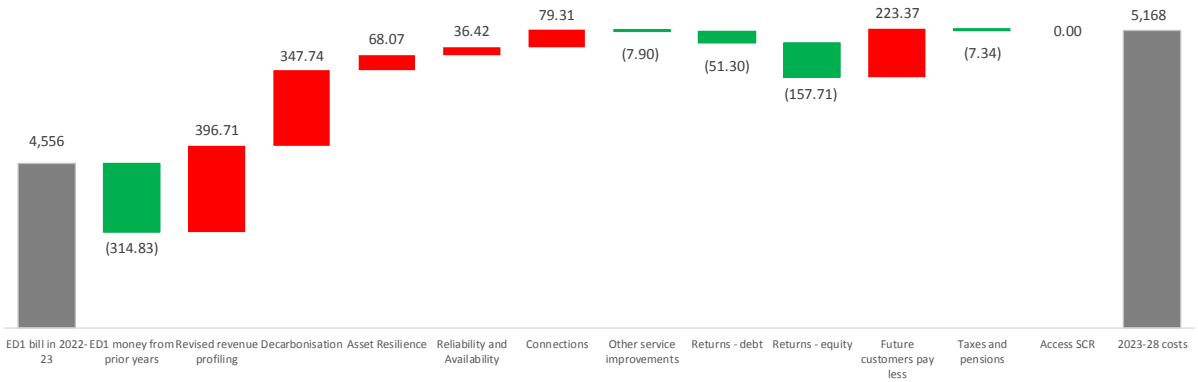
Our view of bill impact (£, 2020-21 prices)

Domestic customer

Non-domestic customer



Low voltage site specific charge customer



High voltage site specific charge customer

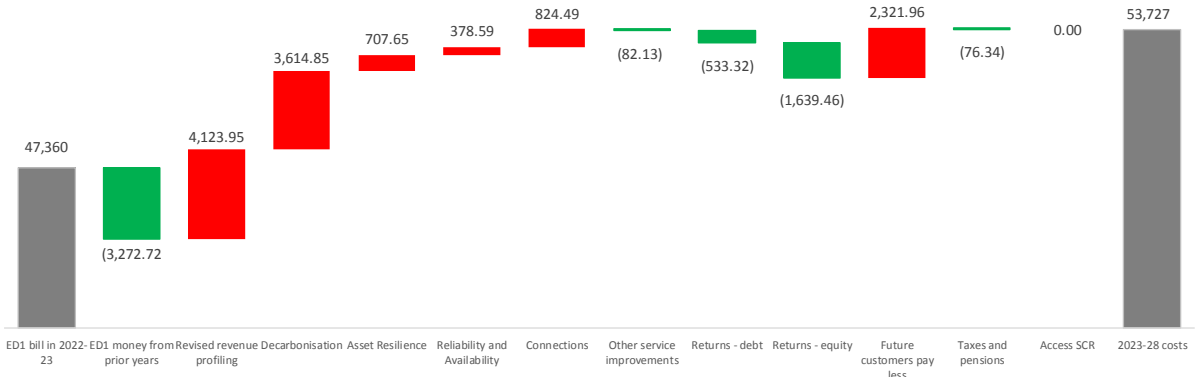


Figure 4: Bill impacts using our view of financial assumptions – under an alternative inflation assumption

Ofgem view of bill impact (£, 2020-21 prices)

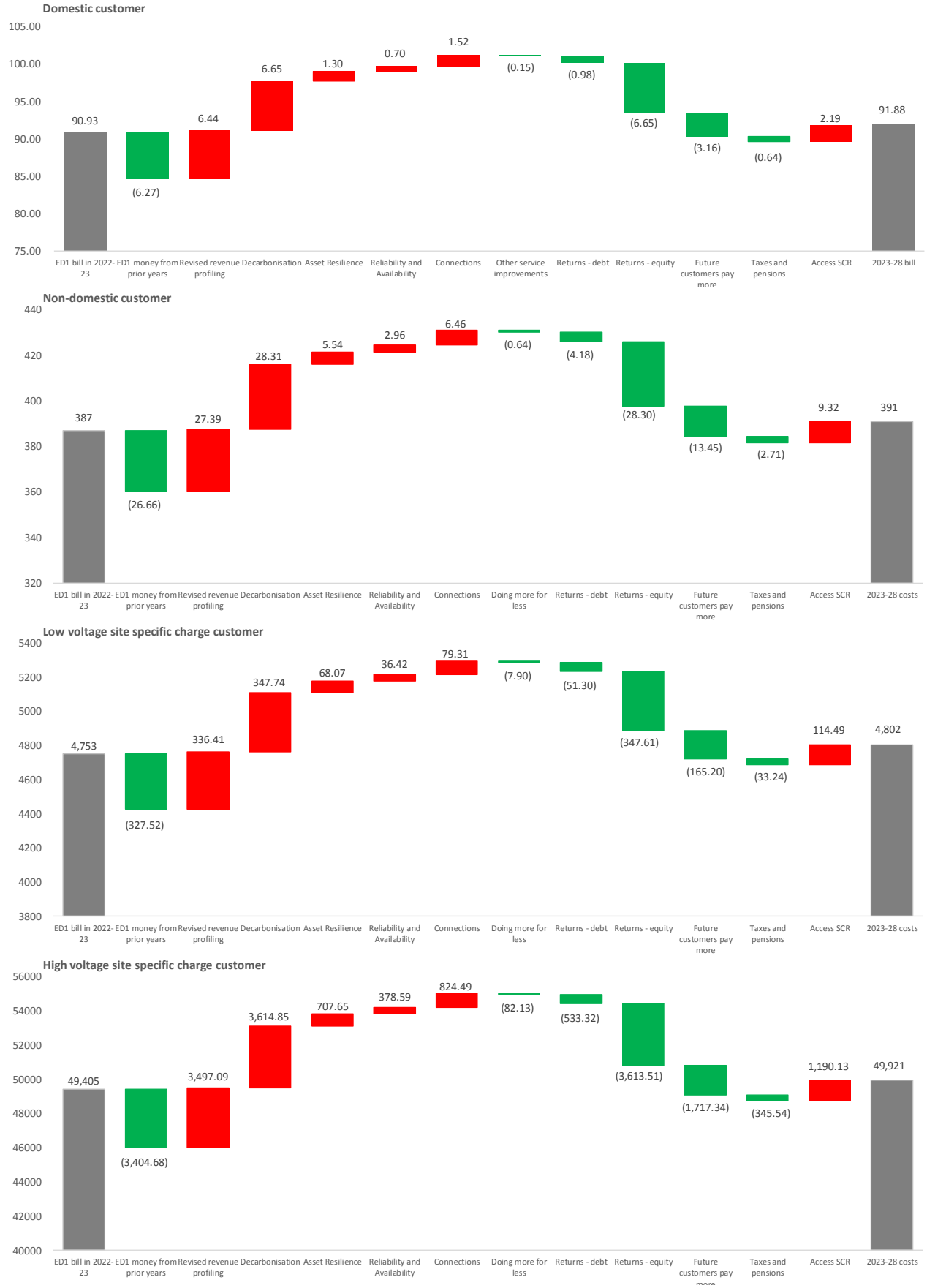


Figure 5: Bill impacts using Ofgem's view of financial assumptions – under an alternative inflation assumption

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