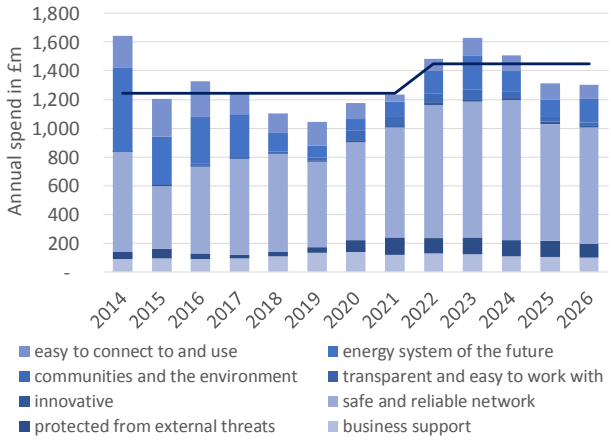
14. Our total costs and how we provide value for money

Our baseline plan costs are £7.1bn

We are proposing to spend £7.1bn over the five years of this plan in the baseline scenario. This is the sum of our operating costs and capital investment to deliver the range of priorities that stakeholders want.

Figure 14.1 Annual totex profile



On an annualised basis, including our forecast of RPEs, this is an increase of 18% compared to T1 because we will be delivering a greater volume of capital investment in T2 required for the future. We are also committing to £383m of future price efficiencies (compared to a 2018/19 baseline) to keep this increase to a minimum.

Our plan embeds efficiencies from the T1 period and contains future efficiency commitments

We recognise that budgets are tight, and we have challenged ourselves hard during the current period to reduce our costs, ensuring we embed those into our T2 plan, as well as making further efficiency commitments for the future T2 period. We estimate the combination of these has reduced the cost of this business plan by £1.1bn (or 13%).

We have systematically built the benefits of our past improvements, engineering and asset management innovations into our plan with an estimated capex saving of £707m over the T2 period.

To ensure we remain efficient over the T2 period, we have also committed to efficiencies in five areas:

- delivering and sustaining the forecast benefits of our UK efficiency programme;
- reducing our capital unit costs to below industry mean;
- reducing some support function costs to align with benchmarks;
- further improving our opex and capitalised labour productivity by 1.1% year-on-year; and
- applying our proven engineering innovations more widely.

These future efficiency commitments add up to a further £383m of savings.

Our costs benchmark well for efficiency

Our network capital costs, the operating costs of running the business and our IT investments have been independently benchmarked by specialist organisations and we are in line with or better than current benchmarks.

This chapter demonstrates our costs are efficient and that we will provide value for money for consumers in the T2 period.

What you can find in this chapter

1. What this stakeholder priority is about

The eighth stakeholder priority is about how we will deliver stakeholders' priorities for the electricity transmission service in England and Wales in a cost-effective way. It is about us providing a value for money package for the T2 period.

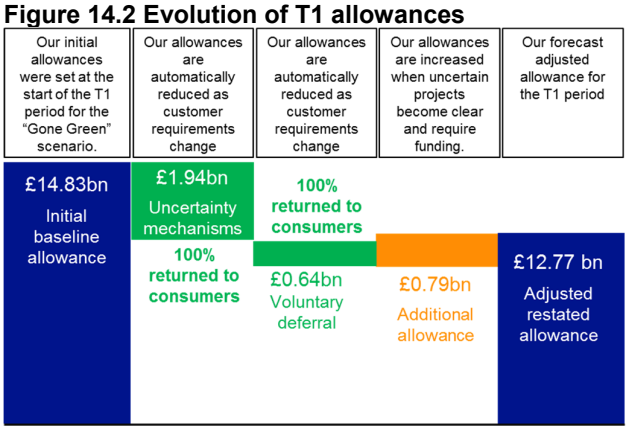
Chapter 6 *Giving stakeholders and consumers a stronger voice* explains that we have tested whether we are providing value for money by collecting evidence on consumer preferences and acceptability and by inviting stakeholders to scrutinise our plan. In summary, stakeholders have told us that they expect us to meet their priorities efficiently and to deliver value for money, over the five years of the T2 period and the longer term.

This chapter covers how we have made sure our proposed expenditure for the T2 period is efficient, including capital expenditure (capex), information technology (IT) expenditure and operating expenditure (opex).

2. Track record and implications for T2

Uncertainty Mechanisms have protected consumers

Figure 14.2 Evolution of T1 allowances



Our T1 totex allowances were set on a 'baseline' energy scenario. As our customers' requirements for generation connections, demand capacity and network reinforcements changed during the T1 period, we needed to invest less than was assumed in the baseline. A range of uncertainty mechanisms adjusted our allowances down to reflect these changes in requirements, and some new projects were funded within period (for example the stakeholder-led visual impact mitigation projects).

In 2016, we recognised that there were some investments we did not need to make during the T1 period that were not covered by uncertainty mechanisms or the mid period review. As a result, we were the first network to voluntarily defer c£600m of allowances into future periods, refunding consumers in T1. Other networks then followed suit.

The learning for the T2 period is that uncertainty mechanisms (acting around a baseline scenario) should be retained. There is scope to refine uncertainty mechanisms to track as closely as possible the underlying drivers of cost. They should also be expanded to cover more areas where requirements are potentially uncertain. This protects consumers from inaccurate forecasts, ensuring they only pay for outputs that are needed.

Treatment of Real Price Effects gave consumers stability over accuracy

A significant portion of our cost base is impacted by the global price of materials, such as copper, which are outside our control and are not adequately dealt with through RPI indexation (these are known as Real Price Effects, RPEs). In RIIO-T1, an ex-ante forecast of RPEs was made and a fixed allowance granted. This placed price volatility risk with networks and gave stability of charges to customers, but exposed consumers to ex-ante RPE forecast error. The indices for RPEs to date have outturned lower than forecast leading to the perception of windfall gains for networks.

Our learning for T2, which was also our position in T1, is that it more appropriate to manage the effects of RPEs for costs outside of our control through an RPE indexation mechanism. Rather than a fixed forecast, the mechanism would see RPE allowances track relevant indices through the period. Whilst this adds marginally to customer charge volatility, it also protects consumers from errors in forecasts of RPEs.

The move to strong totex incentives has driven significant capital efficiencies

We have delivered £1.4bn of capital efficiencies in our asset management activity through innovation and finding ways to deliver our outputs for less. The RIIO-2 Challenge Group and the Independent Stakeholder Group have challenged us to demonstrate how these efficiencies have been carried forward into our T2 plan.

Figure 14.3 below shows the efficiencies achieved in T1 and how these have been included in our T2 plan. We quantify the benefit of these efficiencies in our T2 plan because it is possible to derive a robust counterfactual.

Figure 14.4 below shows the efficiencies achieved in T1 which have also been included in our T2 plan, but we do not believe it is possible to quantify the effects on the T2 plan robustly.

Our learning for T2 is that the framework should continue to provide strong totex incentives to drive innovation and efficiency. Outputs should be expanded to include more of the investment cost base and tracking and reporting should be improved to ensure full clarity over why cost changes occur.

Figure 14.3 Efficiencies for which we have been able to establish counterfactuals for the T2 period

What did you do to generate savings in the T1 period?			How has this been included in this T2 plan?	How much cheaper is this T2 plan as a result?	
Life extension. Worked with university and commercial research partners on specific asset-related projects, rolled out new technology for collecting asset data, invested in more-advanced data analytics and carried on with long-term programmes of testing failed and decommissioned equipment.	Transformers	215	Knowledge gained allowed extension of technical lives of some asset families, reducing the amount of replacement that would have been due in the T2 period.	Using today's unit costs and multiplying by the volume of work that is not now due in the T2 period, the saving is described in Chapter 9 *We will provide a safe and reliable network*	97
	Overhead line conductor	0			204
	Overhead line fittings	86			84
Targeted replacement. Taken on more design responsibility to focus replacement activities on higher-risk or life-limiting components, engineering new equipment to interface between old and new components to allow us to retain reliable infrastructure.	Overhead line fittings	138	Used cost benefit analysis to check new interventions are in consumers' long-term interests and to determine on which assets to use them.	Net savings systematically embedded in our plan by creating new Cost Book rates.	132
	Protection and control	231			66
Application of innovation project outcomes.	Recovery of corroded tower steelwork via enhanced coatings.	45	Ongoing use has been assumed.	Estimated saving based on forecast volume.	124
Total 8-year T1 efficiency = £715m			**Total 5-year T2 efficiency = £707m**		

Figure 14.4 Other T1 efficiencies without counterfactuals for the T2 period

Efficiency driver	Investment area impacted	T1 efficiency (£m)
Targeted replacement. Taken on more design responsibility to focus replacement activities on higher-risk or life-limiting components, engineering new equipment to interface between old and new components to allow us to retain reliable infrastructure.	Switchgear bay replacement and refurbishment	158
	Revised cable programme based on updated network risk	176
Lean working practices. With our supply chain, we have reviewed working methods and procedures to remove bureaucracy and improve productivity, reducing job duration and cost. Our refurbishment facilities were one of the first areas to apply our Performance Excellence approach to improve efficiency. In-sourced project development and strengthened project controls to better control risks in project delivery.	Installing replacement circuit breakers in existing bays	43
	Extended in-house switchgear refurbishment capability	54
	Demountable barriers instead of site-specific flood protection (and decreases due to flood risk category changes)	18
Contracting efficiencies. Introduced a new suite of competitively-tendered, multiple-tier frameworks, in addition to direct competitive tendering, to ensure fit-for-purpose contracting across all sizes of project. We have increased competition by introducing new suppliers through broadening our sourcing strategy. We have also established a specialist, in-house cost estimating function to ensure we understand the fair price for work.	Bulk purchases and use of Tier 1 contractors for switchgear	41
	Best-country sourcing, contracting and scoping of transformer work	46
	Bundling efficiencies, e.g. replacing wallbushings as part of larger projects	50
	Competitive tendering and proactive risk mitigation on London Power Tunnels 1	58
	Lessons learnt from LPT1 and early adoption of Project 13 approach for London Power Tunnels 2 (LPT2)	97
Other smaller cost changes (required to balance to total efficiency number)	Changes in project scope, land purchases, strategic spares, tower foundations, etc	-44
Total 8-year T1 efficiency = £697m (+ £715m = £1412m)		

3. Total costs and headline drivers for T2

In the remainder of this chapter, we bring together the total cost of our plan for the T2 period and evidence why costs are efficient now for the services our stakeholders want, and how our embedded efficiency ambitions will keep our costs at the efficient frontier.

Figure 14.5 shows the cost of our proposed baseline plan based on the common energy scenario. The costs are broken down across each of the key stakeholder priorities and between Capital Expenditure (capex), Operating Expenditure (opex) and Network Innovation Allowance (NIA). We are also making some future efficiency commitments. For our operating costs, these have been embedded in the opex shown. For our capital costs, these have not been embedded and are shown as an 'overlay' line.

We are proposing a baseline plan of £7.1bn totex

The total controllable cost of delivering the key stakeholder priorities in our base plan is £7.1bn (excluding Real Price Effects, as required by Ofgem). The total impact on household and customer bills of these controllable totex costs, RPEs and non-controllable costs is described in Chapter 15 *How our plan should be financed*.

Figure 14.5 Cost of delivering key stakeholder priorities

Key stakeholder priorities		T2 cost in £m		
	Capex	Opex	NIA	Total
1. We will enable the ongoing transition to the energy system of the future	933	3	0	936
2. We will make it easier for you to connect to and use our network	396	21	0	417
3. We will provide a safe and reliable network	3,523	764	0	4,287
4. We will protect the network from external threats	447	108	0	555
5. We will care for communities and the environment	232	23	0	255
6. We will be innovative	0	0	84	84
7. We will be transparent about our performance	1	0	0	1
Business Support	159	491	0	650
Additional capex efficiency commitments (not embedded in stakeholder priorities)	-81	0	0	-81
Total Baseline Plan Costs	5,610	1,410	84	7,104
Forecast of Real Price Effects, RPEs	271	54		325

The table above includes NGET's direct opex associated with inspecting, maintaining and repairing assets and the opex associated with mainly office-based staff involved in planning our work, central asset management activities and undertaking customer-facing roles.

To calculate the overall totex for the T2 period, we then add our business support costs which are required to support the delivery of stakeholder priorities, albeit indirectly. These include costs for functions that are needed to run any large organisation, such as human resources, finance, IT, regulatory compliance, contract management, insurance and property management. We operate a shared services model for these functions, where a single department provides services across a number of National Grid Group businesses. The table shows NGET's proportion of those shared function costs.

Our forecast average annual totex expenditure for the T2 period is £1.4bn; if forecast RPEs are included, this is an 18% increase compared to T1 average spend. Figure 14.6 shows that the increase in expenditure is driven by the need for a greater volume of capital investment in T2. Figure 14.7 then outlines the key drivers for changes in capital investment requirements.

Figure 14.6 Profile of Opex and Capex from T1 to T2

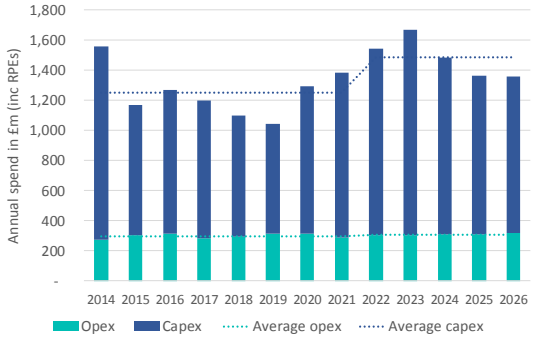
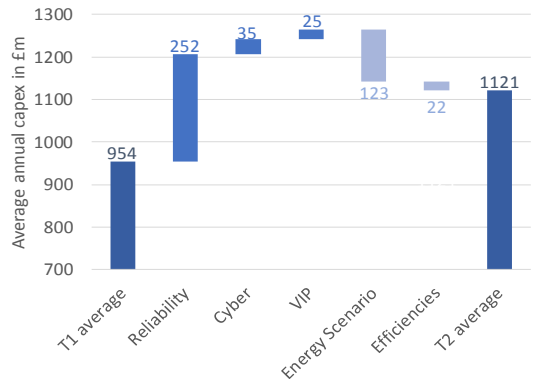


Figure 14.7 Key Capex Cost Drivers from T1 to T2



The drivers of capex changes between the T1 and T2 periods

The key drivers of changes in capital investment from T1 to T2 are:

Reliability – As explained in Chapter 9 *We will provide a safe and reliable network*, we will need to replace and refurbish more assets than in the T1 period to maintain the current level of reliability that our stakeholders are asking for. This is because our network was not installed uniformly, but in peaks, largely in the 1960s and 1970s. The condition of our assets means more of the network falls due for replacement in this period than the last. Replacing these assets is essential to ensuring a strong and reliable network for the future as society becomes increasingly reliant on electricity in the transition to a net zero energy system.

Cyber – As explained in Chapter 10 *We will protect the network from external threats*, the threat of cyber-attack has increased significantly over the last five years and is expected to grow further through the T2 period, requiring a firm level of baseline investment in cyber security to address known risks. We must invest in technology and infrastructure to protect against this threat in order to continue to provide a highly-resilient transmission network for the UK.

VIP – Stakeholder-led visual impact mitigation projects that are forecast to be initiated in the T1 period but, because they are long duration projects, have a greater annual average spend in the T2 period than in T1 causing an apparent increase.

Energy Scenario – Lower volumes of customer connections and network reinforcements than in the T1 period to align with the lower end of the Common Energy Scenario (explained in Part 1 of the business plan).

Efficiency – We have committed to delivering some future capital efficiencies as a result of external benchmarking, innovation and productivity improvements to reduce the costs of the work we deliver. These are summarised in section 8 of this chapter.

4. Our approach to testing cost efficiency

Overall, our approach has been to collect a wide variety of evidence to support our costs.

At the highest level, almost our entire current cost base has either been market tested via competitive tender or benchmarked over the last six years.

We have also used external independent specialists or independent studies to benchmark and assure our costs and forecasting processes wherever we can. We include such evidence for network capital and maintenance costs, business support function costs, IT investment and operating costs and staff pay rates.

We have also analysed our historic costs (internal benchmarks) to identify trends. Some of the results are presented later in this chapter with more detail in annexes NGET_A14.17 Total Opex and NGET_A14.09 Internal Benchmarking of Capex unit costs.

This approach and associated body of evidence should give stakeholders high confidence in the robustness of our cost forecasts, and Ofgem the necessary evidence to continue to adopt strong incentivisation of cost efficiency in the T2 period to stimulate innovation.

The tools available to test efficiency depend on the nature of spend

Figure 14.8 indicates the relative scale of categories of spend as they will be discussed in the following sections. The categories reflect the different ways in which we incur costs, e.g. contracted out vs using our own staff. We have used * to indicate where we have partial coverage, e.g. some direct opex costs are procured competitively.

Figure 14.8 Benchmarking coverage of categories of spend

	Spend area	T2 total	Stakeholder scrutiny	Competitive procurement	Internal benchmarks	External benchmarks
CAPEX	Network-related (Contracted out)	£4.1bn	✓	✓	✓	✓
	Network-related (NGET)	£1.2bn	✓	n/a*	✓	✓
	Non-Operational (mainly Information Technology)	£0.4bn	✓	✓	✓	✓
OPEX	Direct Opex	£0.5bn	✓	✓*	✓	✓
	Indirect Opex	£0.4bn	✓	n/a*	✓	✓
	Business Support	£0.5bn	✓	✓*	✓	✓

5. Our network-related capital expenditure has been tested for efficiency

To connect customers, reinforce our network to enable the economic flow of electricity from generators to demand, and retain a safe and reliable network, we need to invest in network assets. Capital investments mainly consist of building new assets and replacing or refurbishing existing assets. These activities make up 80% of our spend over the last decade and a similar proportion of our business plan; therefore, it is essential that we apply the right effort to understanding and managing these costs.

The efficiency of our network-related investment costs is evidenced by a combination of the following:

- Market testing of our externally-contracted costs
- Informed cost estimation and evaluation
- Internal and external benchmarking of our unit costs to deliver projects
- Cost-benefit analysis
- Robust processes, controls and governance to manage and deliver investments

Driving efficiency through 'native' competition

From 2007, we adopted an Alliance-based capex delivery model to ensure contractor delivery capacity was there to meet rising customer-related investment needs and to address poor contractor safety performance. Partnering with leading engineering firms across a range of sectors offered access to scarce engineering skills, along with the scalability to deliver future investment levels, at the same time as improving safety performance.

As we entered the T1 period in 2013 and customer requirements changed, it became clear that this level of delivery capacity was no longer required and that the core costs of Alliances were not economic against a reducing portfolio of work. We therefore ramped down the Alliances as we introduced a new suite of competitively-tendered, multiple-tier frameworks to ensure fit-for-purpose contracting across all sizes of project. These flexible frameworks are designed to enable a blend of purchasing options to match the different delivery and programme requirements of our many projects. They allow us to choose from equipment supply, install only and supply & install (Engineer, Procure, Construct or EPC) options, facilitating a flexible approach to driving commercial value. Flexibility is important because we work on a live network; our planned work evolves over time to accommodate the changing needs of our customers and in response to system operation constraints.

We have also retained the option of direct competitive tendering where we think this will drive extra value, for example for larger programmes of work. For smaller works, we have developed our in-house delivery capability with our operational staff delivering minor capex projects alongside repairs, etc. Resources permitting, ET Operations are able to deliver works such as targeted overhead line fittings replacement, refurbishment of bay equipment and replacement of single assets such as instrument transformers; doing so maximises the utilisation of our field force, retains critical skills in the workforce and avoids the need to pay contractor overheads and fees.

We have also increased supply base competition during the T1 period through broadening our sourcing strategy to include countries such as South Korea and China. We have a Group Procurement function that supports both our UK and US businesses to allow us to leverage our worldwide buying powers. We share learning between our UK and US, gas and electricity, and transmission and distribution businesses to continuously develop our procurement activities to ensure we are sourcing and negotiating the right products at the best price from around the globe. The activities of our Global Procurement function are described in annex NGET_A14.06 Delivering competitive value through Procurement.

This commercial and contracting approach is reflected in our native competition plan, which is summarised at the end of this chapter.

Market testing through competitive tender is a key method used to achieve value for money over time. It offers the opportunity to test the market for the latest techniques and prices, as well as giving us access to wider expertise. We also understand that, to get the best prices, we need to be an informed buyer.

Informed cost estimation and evaluation

Understanding what equipment and activities should cost is crucial to ensuring that we are delivering work efficiently. To do this for capital investments, we established a team of in-house expert cost estimators in the E-Hub (Estimating Hub) at the start of the T1 period. They maintain an internal cost reference database which is used to build detailed cost estimates to ensure that we are an informed client, understanding what a fair price would be when tendering works to contractors. This detailed cost estimate is built bottom-up based on the physical scope of works, delivery programme, anticipated project risks and market benchmarking of costs. It is used to sanction projects before we go out to tender and move into delivery.

To build our knowledge of the market, all supplier tender returns are forensically analysed to ensure costing elements used are reflective of external market conditions. With this information, we can challenge and negotiate with suppliers to secure the optimum quotes for projects. This process also allows us to update our internal cost reference database with tendered data to improve our initial plan entries and increases confidence in forecasting.

Following scheme completion, the final costs of each project are further analysed to understand what risks materialised and what variations were paid for during delivery, so that again we can update our cost database and improve our processes. A benefit of this analysis is the opportunity to understand trends in delivered costs over time.

This same cost database is used to maintain unit costs to build our cost estimates at the beginning of the investment process based on standard work scope. These groupings are held in a 'Cost Book' which is employed to set the budgetary estimates during the early pre-construction phases. These are a proportionate way to create estimates for future projects which, while there will ultimately be site-by-site variation, will be right on average.

Some of our expenditure in the T2 period will already have tendered costs or be in delivery (i.e. contract awarded). In addition, for projects where we do not have established unit costs, we have used detailed E-Hub estimates to create forecast costs for our business plan submission.

We have third-party independent assurance (from TNEI in June 2019) to support the robustness of our process for periodically refreshing our cost book. The underlying elements of our Cost Book (assumptions, inclusions and exclusions) have been assessed and updated to reflect the current scope and market prices to define a repeatable unit cost. Key cost drivers have been identified, allowing for removal of outliers to create a well-defined sample for the analysis. The Cost Book unit costs have been updated in our core systems to reflect the output of this assessment.

This cycle of continuous improvement (delivering value and driving down the unit cost, then re-baselining this unit cost for future projects) has kept our costs efficient over the T1 period and means that our T2 submission will systematically include the efficiency we have delivered historically.

Internal capex benchmarking (historic trends)

As indicated by the above process, the main evidence to support our cost estimates for T2 period investments comes from analysis of projects delivered in the T1 period. Investment Decision Packs contain more detailed analysis of costs and volumes for both historic and forecast projects; this section shares some examples from major capex spend areas. These focus on non-load related investment because load-related projects are much less homogeneous (they contain a varying mix of asset types) but load-related projects are made up of the same fundamental building blocks and are appraised using the same Cost Book and cost estimation process.

In each case, the table shows the total cost in each category and the total volume delivered in each price control period (all years). Dividing one by the other gives a top-down average cost per unit that can be used to simply compare the T1 period with the T2 period (before future capex efficiency commitments).

Transformers. We have delivered a 3% reduction in the average cost of transformer replacement over the T1 period compared to allowances.

Transformers (excluding spares)	T1 allowed	T1 (all years)	T2 forecast
Total cost (£m)	764	444	273
Volume	[redacted]	[redacted]	[redacted]
Cost per unit (£m)	[redacted]	[redacted]	[redacted]

This experience has been reflected in our T2 plan, and the cost per unit has reduced further because we have no off-line replacements (which is a major cost driver) in our forecast.

Overhead line conductor. Over the T1 period, we have delivered a greater volume of work than originally envisaged at a lower cost than we were allowed.

Conductor	T1 allowed	T1 (all years)	T2 forecast
Total cost (£m)	578	533	624
Volume	[redacted]	[redacted]	[redacted]
Cost per km (£m)	[redacted]	[redacted]	[redacted]
Cost per km (£m)	Excluding Tyne Crossing		[redacted]

The average cost per km in the T2 period is distorted by a major project to address the Tyne Crossing. When this is excluded, it can be seen that the T2 average cost per unit is 11% lower than that achieved in the T1 period.

Overhead line fittings. As described in Chapter 9 *We will provide a safe and reliable network*, there has been a material decrease in the cost per km of replacing fittings due to the introduction of a novel targeted approach during the T1 period.

Fittings	T1 allowed	T1 (all years)	T2 forecast
Total cost (£m)	222	54	83
Volume	[redacted]	[redacted]	[redacted]
Cost per km (£m)	[redacted]	[redacted]	[redacted]

The T2 forecast plan has a higher average cost per km than we have achieved in the T1 period; this is due to the forecast mix of routes and an increased scope of intervention.

Protection and Control. Over the T1 period, we have innovated to introduce targeted interventions which

mean that we are forecasting to complete delivery at a lower cost per unit than we were allowed.

Protection & Control	T1 allowed	T1 (all years)	T2 forecast
Total cost (£m)	478	246	489
Volume	[redacted]	[redacted]	[redacted]
Cost per unit (£m)	[redacted]	[redacted]	[redacted]

As described in Chapter 9 *We will provide a safe and reliable network*, these new approaches have been built into our T2 submission.

Cables and tunnels. It is not appropriate to undertake simple cost per unit length analysis for cable projects because each is bespoke and highly dependent on scope, e.g. whether the cable is direct-buried or in a new or existing tunnel, and physical location. The majority of our planned investment over the T2 period is associated with London Power Tunnels 2 (in south London); the main tunnelling work is currently out to tender, and we will be letting contracts and starting work in the T1 period. Our current cost estimates have taken account of detailed learning from the London Power Tunnels 1 project (in north London) which was similar in scope.

External capex benchmarking

To provide additional evidence to validate our internal approach and use of unit costs for the T2 period, we have commissioned an external benchmarking exercise from TNEI. TNEI is an independent specialist energy consultancy providing technical, environmental, strategic and consenting advice to organisations operating within the conventional and renewable energy sectors. TNEI's report can be found in annex NGET_A14.02 TNEI Asset Unit Cost Methodology Review.

In summary, TNEI have assured our approach to historical unit cost analysis by:

- validating our approach to tracking and using unit costs for capital investments
- verifying the findings of our historical unit cost analysis
- comparing our unit costs with anonymised external benchmarks.

The report covers 40 of the major 'building blocks' which make up our capital investment plan (including transformers, reactors, overhead lines, cross-site cables, switchgear, protection and control systems). This required us to align the scope of our units with their data to make sure that they were comparable. We provided our final, delivered costs for the installation of new assets (mostly in situ, but some off line). These costs included our capitalised 'on costs' for developing, delivering and managing projects through to commissioning and closure. This means that total costs will be comparable regardless of the chosen delivery model; for example, internal project management costs can vary depending on whether a company chooses to contract a Tier 1 supplier to manage all subcontractors, or whether the company manages such interfaces themselves.

TNEI used industry mean costs as a valid comparator because across their international dataset there are variations in standards (e.g. around safety) and approach to whole-life asset management (such as maintenance requirements and operational longevity).

Their findings were that, for more than half of the 40 units reviewed, our costs were below the industry mean. For the remainder, our costs were between the industry mean and maximum. Overall the benchmarked costs in our T2 plan were £100m cheaper than the industry mean. However, we have committed to taking an efficiency challenge on ourselves to reduce all of the above-mean unit costs in our plan to TNEI's industry mean. This equates to a further reduction in forecast capex for the T2 period of £44m.

In addition, we are committing to a further efficiency challenge of a productivity improvement of 1.1% year-on-year (for the proportion of capitalised costs associated with our employees). This is described later in this chapter but equates to an additional efficiency challenge (and therefore cost reduction commitment) of £37m.

Sharing best practice across the infrastructure and energy sectors

By participating in external groups (such as the British Tunnelling Society, Association of Cost Engineers and Society for Cost Analysis & Forecasting), we learn about estimating and cost forecasting best practice, understanding how different sectors manage uncertainty and risk. Where we are able to identify market rates for generic activities (e.g. tunnelling rates through different ground conditions), we use these to inform our 'bottom-up' estimating. We use our own information (both on actual projects delivered and from tender returns) to calibrate our subject matter experts' understanding of project costs to ensure they take account of new technologies and remain aligned to current market conditions. Finally, we leverage the benefits of being an international group by sharing learning with our US business.

We have tested our investment plan using cost benefit analysis

We have carried out Cost-Benefit Analysis (CBA) of our proposed projects for the T2 period. Certain areas of our spending are automatically covered by CBA. For example, schemes that deliver wider network capacity are assessed by the Electricity Network Operator's Network Options Assessment (NOA) process. NOA selects the least regret option from a range of alternatives for investing in the transmission network; it uses an extensive CBA process that takes account of

proposed investment and forecast system constraint costs under a range of Future Energy Scenarios.

For projects that are not covered by automatic CBA, we use our own CBA to select preferred options. This is a proportionate approach that allows us to take account of wider benefits to consumers. For example, we assess whether spending more now could save money for consumers in the long term.

A portfolio of Investment Decision Packs, containing CBAs, has been produced to support our business plan. These will be reviewed by Ofgem as part of their assessment process.

Our investment processes, governance and controls are robust

We have a lean, standardised end-to-end investment process with gates to control the quality of projects as they move from inception through to approval, delivery and closure. Supporting this, we have a framework of governance and assurance which includes mandatory and voluntary financial controls in conjunction with internal and external audit activities. Finally, we have annual regulatory reporting requirements which involve us submitting performance reports and data to Ofgem each year. These processes and controls are described in detail in annex NGET_A14.05 How we contract and deliver efficiently.

Our process for tracking, updating and challenging unit costs for estimating the cost of future capital projects was specifically reviewed by TNEI. They found that "NGET applies a broad range of differing estimating methodologies to ensure that the final unit cost is aligned to the most probable outturn cost, and the techniques used are logical and aligned to good industry practice & guidelines. The use of different estimation methodologies results in a range of estimated costs updated on a yearly basis, which enables our estimator to question any significant differences leading to more accurate estimates". Details of their review are contained in annex NGET_A14.02 TNEI Asset Unit Cost Methodology Review.

6. Justification and efficiency of our Information Technology investment

Information Technology (IT) underpins the safe and reliable operation of our transmission system and enables our business to function efficiently, delivering value for money for our customers. We have spent above our IT allowances in the T1 period to ensure our workforce have the tools to stay productive and to enable lower operating costs and better controls in our business support functions. Our increasing reliance on IT, together with the requirement to replace applications and infrastructure as they reach end of life and respond to a growing cyber threat, is driving an increase in baseline IT investment in the T2 period.

Our IT Investment in the T1 period

At the start of the T1 period, we responded to the efficiency challenge by extending the technical lives of our IT infrastructure assets, accepting higher levels of risk whilst maintaining levels of availability. However, as we continued through the T1 period, our employees fed back that IT was becoming a significant blocker to their effectiveness at work. Over the same period, the increasing rate of change of technology and the escalating threat of cyber-attack on our IT systems meant that we had to look again at how we managed our infrastructure so that we could proactively monitor and remediate cyber threats. In light of this, we have revised our IT asset health policies, which have been reviewed by independent IT experts Gartner, who confirmed that they are in line with industry practice.

We have recently implemented a series of investments in new systems to support our HR, purchasing and financial transactional processes in response to analysis that showed that we had more manual process steps than "world class" functions. These investments will support better controls and lower costs of function as we start the T2 period.

Our proposed IT Investments for the T2 period

Our IT investment portfolio for the T2 period continues the work we have begun in the T1 period to bring our IT infrastructure assets in line with asset health policies, so that our people have the right tools and equipment to work effectively, and we can share data securely and effectively to promote cross-sector collaboration. The forecast cost of our IT investment plan for the T2 period is £148m, including £48m of investment costs to support future application implementations and upgrades on behalf of our business support functions. These costs are in addition to the IT expenditure driven directly by the Electricity Transmission business and those that are needed to keep our network cyber resilient, which we have included in our key stakeholder priority chapters.

The key areas of investment for shared systems are in Enterprise Networks, Hosting, End User Computing (Modern Workspace), IT Operations and Tooling and Business Services. In each case, investments have been subject to broad ranging optioneering and cost benefit analysis.

Enterprise Networks comprises the wide area network or 'WAN' (connections between sites) and the local area network or 'LAN' (network within sites including wireless networks) that support data and voice communication services that are essential for the safe, reliable and secure operation of our business. Failure of these services will significantly compromise our ability to deliver on our commitments to customers and consumers and the productivity of our workforce.

Following optioneering and detailed analysis, we propose investment of £23m across the T2 period to:

i) replace 400 WAN routers at 300 sites as they reach end of life

ii) replace 1,000 LAN switches and 900+ wireless access points
iii) provide 6,000 user accounts for voice services.

Implementation of a modern, cyber-secure WAN/LAN architecture is essential to support the adoption of cloud-based services and drive increased workforce efficiency.

Hosting is the generic terminology used to cover several technologies such as Storage and Compute. These technologies may be hosted in a physical data centre owned and operated by National Grid or by a third party and may be hosted remotely in either public or private cloud. These environments, together with the Enterprise Network, provide the overall infrastructure that is essential to the day-to-day operation of our business.

One of our key learnings from the T1 period is that perceived savings from extending core IT asset life can prove to be a false economy in the longer term. The impact on productivity, efficiency and customer satisfaction of poorly performing IT infrastructure is felt across the whole organisation. We have identified and evaluated a range of options to meet our hosting requirements and concluded that a hybrid cloud approach is the most effective and economically-efficient approach, blending the security of private cloud, where it is necessary, with cost-effective public services at a cost of £20m across the T2 period.

End User Compute (Modern Workspace) comprises computing devices (laptops and tablets), managed printing and the new digital workplace which are needed to provide fast, frictionless, and end user-focussed services.

Investment of £15m is required across the T2 period to maintain currency and appropriate performance levels for end user devices. We intend replacing devices every three years (3,000 devices per annum) as a continuous programme of work, and an Enterprise Mobility Management solution will be deployed to manage tablets, mobiles and laptops on a common platform ensuring Windows 10 and O365 security patches are applied rigorously to mitigate the increasing cyber threat. A three-yearly replacement policy for end user devices recognises the increasing rate of change of technology and associated operating systems and is consistent with the Gartner benchmark.

IT Operations & Tooling refers to the operations and service management capabilities that are required to deliver excellent operational performance of the IT services and infrastructure that support the core business.

Our current IT operations are adversely affected by factors including limited visibility of real end user experience; inadequate real-time data on end-to-end application performance; and manual and labour-intensive application management, which is both inefficient and leads to a poor end user experience.

Our investment of £23m across theT2 period will establish cloud aware cost transparency for all IT costs across the business enabling effective prioritisation and decision-making, and we will implement tools and automation to streamline our processes so that the IT estate can be managed as cost efficiently as possible across planning, build, provision and maintenance activities. We will also invest in the consolidation and automation of the network operations centre to ensure optimised network operations.

Automation will enable us to balance efficiency and the need for rapid change as we continue to invest in the people, tools and processes needed to execute and manage the business of IT optimally.

Collectively these investments will rationalise and modernise our IT infrastructure, providing a reliable, cyber secure environment that is flexible for the future, and will provide a foundation for us to digitally transform our business to meet the needs of our customers and stakeholders.

Business Services are delivered through a shared services model with support functions providing the efficient delivery of common services such as HR, Finance, IT, Legal and Procurement to our businesses.

Investment of £48m is required across the T2 period to refresh and maintain our core back-office systems. This will make sure the investments made in the T1 period do not become outdated, inefficient and non-compliant with legislation and regulations. It will also ensure that our systems and data are not exposed to increased levels of cyber risk and operational failure.

Overall ET IT Investment is outlined in annex NGET_A14.07 ET IT Investment, and the over-arching IT Strategy is included as annex NGET_A14.08 IT Strategy. Investment Decision Packs are included as annexes NGET_A14.03 Hosting, NGET_A14.15 Business Services, NGET_A14.18 Enterprise Network Refresh, NGET_A14.19 End User Compute, and NGET_A14.20 IT Operations & Tooling. Our Cyber Strategy is included as NGET_A10.03. We have separately published our Digitalisation Strategy on our website and provided a hyperlink to Ofgem. This strategy outlines how we will use technology and data to digitally transform our business and includes some initial thoughts on our response to the recommendations of the Energy Data Taskforce report on ‘A Strategy for a Modern, Digitalised Energy System’.

Our IT investments are in line with external benchmarks

We have submitted our IT investment plans, including those investments relating to Electricity Transmission

applications, for independent review by Gartner – a recognised IT benchmarking organisation. They found that the mix of investment areas, the individual project costs and our project rate cards were all in line with their expectations, formed from their knowledge of IT investments made by other utility companies.

7. Justification and efficiency of our operating costs

Our operating costs are the costs we incur on an ongoing basis to run and maintain the network, provide customer service and operate our business. As such, they contribute to all the stakeholder priorities in our T2 plan.

Collectively, our total operating costs are forecast to be £1,410m and make up 20% of our totex expenditure for the T2 period. On average our operating costs are £282m per year. 39% of these costs are spent on activities that directly impact our assets, such as maintenance activities and asset inspections. 30% is spent on customer-related and work and asset management activities and 31% on business support functions such as IT, HR and finance.

Evolution of our operating cost base through the T1 period

The mix of our operating cost base has changed over time as the result of business decisions to invest in support activities to reduce costs elsewhere and the need to respond to external challenges. Therefore, it is important to consider the total operating cost base as a whole. As we entered the T1 period, we were facing growing maintenance requirements from a more diverse and ageing asset base with coincident challenges in the supply and demand of adequately trained workforce.

In response, we reset our operating model at the start of the T1 period and restructured our business to realign accountabilities, introducing lean continuous improvement capabilities and optimising our support functions for additional operational workload. This allowed us to mitigate some of the upward pressures in workload and reduce our workforce by over 100 roles. As our asset base has grown through the period, we have invested in IT systems to automate the monitoring of our assets and understand more about their condition. This delivered savings in our direct maintenance costs and additionally enabled us to minimise capital requirements in the period.

In terms of business support costs, IT costs increased because of the IT systems we invested in to support our asset maintenance and additionally as we developed our capability in identifying and managing the increasing cyber threat to our operations. We also needed to increase the scope of our financial control activities to respond to new and increasing compliance requirements. The benchmarks that set our allowances did not take these increased activities into account and we were not able to contain these costs within our allowances. We take these lessons and others into our T2 business plan.

We are forecasting to bring our total opex costs below allowances by the end of the T1 period but will have cumulatively overspent due in part to business support allowances being set using overly simplistic benchmarks.

Building on the experiences and capabilities we developed in the first half of the T1 period, we are currently undertaking an ambitious, UK-wide bottom-up transformation of our business (called Performance Excellence Value, PEx) which enables us to bring in new skills and capabilities to reflect the changing needs of our customers and reduce costs. We have identified a suite of co-ordinated initiatives which we believe will deliver savings including realigning processes using lean techniques, replacing our financial systems to improve and streamline controls and introducing more flexible field force arrangements which will be implemented over the remaining years of the T1 period.

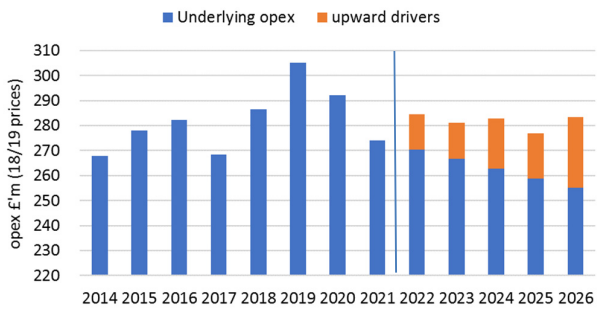
Commitment to reducing our cost base by £40m a year

The resulting re-shaped organisation and cost base will make us fit for delivering new challenges in the T2 period. We are forecasting to deliver annual opex savings of £40m by March 2021 (from a baseline of 2018/19 outturn costs) and we are committing to achieving and sustaining these future efficiencies for the T2 period, making a T2 saving of £200m. Later in this chapter we demonstrate that our pay is comparable with peer companies and that savings bring our business support costs in line with or better than benchmarks.

Commitment to £47m productivity improvement

On top of these savings, we are challenging ourselves to find more efficiencies in the T2 period. We are committing to a stretching productivity improvement of 1.1% per annum which is nearly three times the current UK trend for productivity. Our T2 opex plan therefore reflects a commitment to re-set the cost base and a commitment on productivity improvement, both which have been embedded. The figure below shows the impacts of these on our underlying cost base.

Figure 14.9 Reductions in underlying opex

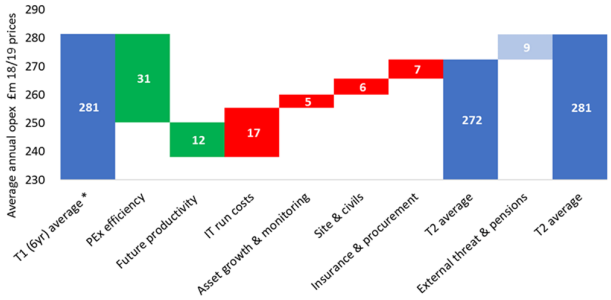


However, we are also forecasting a number of upward cost of pressures (orange bars). Changes from the T1 period are shown in Figure 14.10.

Cost driver changes from the T1 to the T2 period

In the following waterfall chart, we have converted our efficiency commitments to be consistent with a T1 average outturn comparator. We also identify four key upward cost drivers between the periods:

Figure 14.10 Changes in Average Annual Opex between the T1 and T2 period



*T1 6-year average outturn based on 2013/14 to 2018/19 actual spend, adjusted for change in tower painting cost treatment in T1

IT run costs +£17m

The costs of supporting our IT systems has grown through T1 as we have made investments in asset data management systems and built our capability to respond to an escalating cyber risk. Average spend for the early part of T1 was £33m per annum, however our IT costs are forecast to reach £49m by the end of T1 as we expand our cyber resilience activities and support investments we are making to make our transactional business support functions more cost efficient. Independent benchmarking experts Gartner have confirmed that our IT operating costs are efficient as we enter the T2 period.

IT operating costs fall throughout the T2 period, as the cumulating impact of our 1.1% per annum future productivity improvements offsets the incremental cost of supporting further investments to support key business processes, deliver our IT cyber plans and modernize shared IT infrastructure and hosting capabilities. Overall, this results in IT operating costs for the T2 period that are on average £17m per year higher than the first six years of T1. We give more detail on the drivers for this transformation in annex NGET_A14.08 IT strategy.

Asset growth and condition monitoring +£5m

We are forecasting cost increases in asset maintenance costs due to the newly-commissioned Western HVDC Link, a forecast 2% growth over the T2 period in the network asset base and an increase in condition monitoring installation. The WHVDC link will minimise total costs to consumers by reducing system constraint costs, and condition monitoring will help us better-target asset interventions.

Operational site costs and carbon offsetting +£6m

We are anticipating increased costs on our sites including our operational rents and vegetation management. Operational property rents relate to leases for sites such as substation leases which will need to be renegotiated over the T2 period. Whilst we work hard to manage the impact of a general trend in rising market rents we will not be able to offset the full impact of these sites. We have challenged ourselves to retain 50% of the risk of rental increases limiting the impact to an increase of £1m in direct opex by the end of the T2 period. We will also spend £1m per annum more than in the T1 period on maintaining the physical security of our PSUP sites, two more of which will be commissioned in the T2 period.

[redacted]

Our stakeholders want us to continue our work from the T1 period on reducing our capital carbon from construction with the ambition to achieve net-zero carbon construction by the last year of the T2 period. A value of £2.5m has been estimated in the final year to offset the residual unavoidable carbon impact of our T2 construction plans, which is represented as an average of £0.5m per annum increase to our indirect opex costs. For more information see annex NGET_A14.17 Total Opex.

Insurance & procurement +£7m

Sustained losses due to events such as natural catastrophes, wildfires, etc, are driving increases in insurance premiums globally. Whilst we insure our businesses via a captive insurer arrangement (where National Grid effectively self-insures), this arrangement can only mitigate some of the external pressures from the commercial insurance market. These pressures will drive an increase in insurance premiums of £3m on average through our T2 plan, compared with the T1 average costs; despite this increase, in the next section we demonstrate that our costs are 30% below market rates.

As part of our PEx efficiency programme, we moved contract management expertise that had previously been spread across the business into our procurement function, reducing overall cost but increasing the procurement function cost by £3m per annum relative to the T1 period.

Despite these upward pressures, the average baseline operating costs for the T2 period will reduce by £9m per annum compared to T1 average outturn. The cost of our opex activities in 2019 will decrease by £31m by the end of the T2 period.

Other structural changes

In addition to these drivers, we anticipate an average increase of £7m per year in costs relating to

enhancements to external threat protection at our operational sites. Whilst we have high confidence in the efficiency of these costs, changes in Government requirements may lead to future scope changes. We anticipate these costs will be covered by a "use it or lose it" uncertainty mechanism, meaning we will only be funded for the work that is needed at the time and so we have shown them separately to our other baseline opex costs. More information on these activities can be found in Chapter 10 *We will protect the network from external threats*.

In its RIIO-2 Sector Specific Methodology Decision, Ofgem confirmed the reclassification of Pension Protection Fund levy and pension admin costs from pass-through costs to be totex costs for the T2 period. We therefore show an additional £2m per annum of cost because of this reclassification.

Our operating costs have been tested for efficiency

In testing the efficiency of our operating costs, we used a variety of approaches depending on how the cost was incurred. When we procure goods and services from third parties, we follow rigorous OJEU procurement guidance ensuring that we robustly test the market for prices. This enables us to give external assurance on our procured costs. Where our costs relate to our own people and processes, we have looked to external and internal benchmarking evidence to provide this assurance. Figure 14.8 summarises how we have used efficiency evidence to test our opex plan and we discuss each area of evidence in more detail below.

We benchmark our maintenance activities internally

Our direct opex costs are a function of our asset inventory, for example, types of equipment, their age and condition, and our maintenance policies. We review our maintenance policies on an ongoing basis using the latest condition and performance information in order to enable assets to achieve their anticipated asset life and reduce the potential for unplanned disruption. Drivers for changes to policy include the identification of new defects, or legislative changes such as the Pressure System Safety Regulations 2000 which increased the time it takes to complete tasks.

We have standard costs for each plant type and activity including routine non-outage inspections, basic maintenance activities and planned major maintenances. These all have a frequency associated with them, allowing us to build a forecast plan in our work management system. This plan indicates a demand for labour and materials. Therefore, asset inventory multiplied by maintenance policy equals work. Each work item has a standard job with resources and associated cost to facilitate estimating.

As work is delivered, actual costs for standard jobs are analysed, outliers removed, and updated costs reflected in the core system. A reporting tool known as Tableau has been introduced during the T1 period to help visualise the data. Tableau reports help team leaders highlight variances from the standard; where the variance is due to new ways of working, which reduce costs, the practice is shared nationally. Our T2 submission will be based on our latest forecast of efficient direct opex costs, supplemented by estimates for new cost areas such as an increasing need for cyber security measures.

We are also able to share best practice with our US business. We have an Asset Management and Engineering business management standard which sets out minimum requirements across the whole National Grid Group. This standard establishes the terms of reference for the Engineering Assurance Committee, and a key activity of this committee is sharing best practice across the group. Examples of sharing include peer reviews which are focussed on a particular topic (e.g. risk management, cyber threats) and sharing of asset management maturity assessment results. In addition to organised exchanges, regular interaction has fostered a culture where opposite numbers will contact each other on an ad hoc basis to ask questions and gain insights.

Our maintenance activities are benchmarked externally

Since 1994, we've also been engaging in external benchmarking activities, comparing our costs and maintenance activities with organisations across the globe. Benchmarking is a licence obligation and the use of benchmarking to support continuous improvement is a feature in ISO 55001 "Asset Management", against which we hold accreditation.

Our direct opex is benchmarked via ITOMS (International Transmission Operational Maintenance Study), a closed confidential forum of more than 31 companies representing 25% of electricity transmitted across the globe. The participants operate in diverse environments (regulatory, economic, environmental, etc); this diversity serves to benefit the group, as different companies bring different ideas and practices to the table which can be beneficial to all.

The ITOMS benchmarking study is a consultancy-led biennial exercise. ITOMS benchmarks ~50% of our expenditure on inspection and maintenance activities, covering all of our major plant types with the exception of cables as most other participants have small populations.

The most recent ITOMS study was undertaken in 2018 based on 2017 data (i.e. before the restructuring work, we are currently undertaking and excluding the productivity assumptions included in our plan). In summary, the study shows that, while we had higher than average opex costs for most maintenance activities, we also have higher than average performance. For example, we consistently have higher than average reliability (being one of the best in the

study for energy not served) and better than average safety performance. The results indicate that have one of the oldest asset bases in the study, and that the cost of care is expected to increase as equipment approaches end of life. We present more details on the latest study in annex NGET_A14.17 Total Opex.

Our pay benchmarks in line with our peer group

We test our pay deals against our peer group and regularly benchmark our employee remuneration to ensure it remains in line with the market. Our annual pay awards are benchmarked against those of network companies and other competitors in the skills market. We ensure that any deal we put in place with our trade unions or annual pay rise for managers is in line with our peers so that we do not fall out of step with the market, but equally so that we do not become a higher-than-market payer.

To more effectively control costs and remain competitive in the labour market, we have also made adjustments in recent pay deals to reduce long-term staff workforce costs including:

- changes to the performance pay matrix that aligns individual pay awards to market practice
- the annual settlement figure setting base pay awards moving away from an RPI formula to a more rounded consideration of wider factors.

From a benchmark perspective, we undertake regular pay and benefits reviews, with the latest study completed in 2018 by Korn Ferry (a people and organisational consultancy). We adopt a single pay framework across our UK regulated businesses. This means that all of our employees' (both direct and support function) costs have been recently benchmarked. In summary, total cash remuneration was in line with median pay for a comparator of 130 entities in the Utilities, Oil & Gas and Chemical sectors.

Our business support costs benchmark efficiently

We regularly use benchmarking exercises to test the value that our business support functions deliver. In preparation for our business plan submission, we commissioned studies to test the efficiency of our HR, Finance, Audit and Regulation, Procurement, Property Management, CEO & Group Management and Business support IT costs. We did not include health and safety costs or insurance costs, as the varying levels of risk between businesses means comparisons are limited in these areas.

We invited The Hackett Group, a global business benchmarking organisation, to perform a high-level benchmarking assessment for our combined business support costs for electricity transmission, gas transmission and electricity system operator businesses. For our IT costs, we also engaged Gartner (an industry-recognised specialist in IT benchmarking) to perform a more detailed analysis of our operational and non-operational IT costs, comparing costs for each key activity (e.g. application support, networks, storage, end-user computing) with those of other companies in their database, adjusting for workload (i.e. number of applications, number of services, number of users). We did this because simplistic comparisons of total IT costs between companies do not account for factors such as the number and level of availability of business applications supported.

As a result of this analysis, we have reduced the costs of our CEO and Group management activities in our plan by £13m over the T2 period to align with the upper quartile benchmark. In all other areas, the benchmarking analyses showed that our costs were in line with upper quartile efficient level after accounting for additional activities to non-regulated businesses (such as regulatory activities), and our obligations as operators of Critical National Infrastructure Sites, or in line with peers (the recommended level for effective operation of IT) for IT function costs. These studies and their findings are presented in more detail in annex NGET_A14.17 Total Opex.

Our insurance costs are 30% lower than commercial market premiums

We insure our businesses through our captive insurance company, 7wherever it is efficient to do so. Under this arrangement, insurance is provided by a licenced insurance company owned by the group, set up specifically to underwrite the insurable risks of our business operations. We periodically use external consultants to review the premiums considered achievable in the commercial market for our risks, and to compare these against the premiums charged and forecast by the captive. We last did this in 2019, using Aon Global Risk Consulting and RKH Speciality, who estimated the commercial market premiums would be over 30% more than our proposed premiums for the T2 period. This equates to over £10m of savings to consumers for the five years.

8. Summary of our total future cost efficiency commitments

Throughout this section, we have outlined future efficiency improvements that we are committing to seek to achieve which reduce the costs of our T2 totex plan by a total £383m. These are summarised below:

- We are committed to delivering and sustaining the benefits of our stretching UK efficiency programme. This is an efficiency commitment of £200m.
- Independent specialist consultants have benchmarked our capital investment unit costs against similar international companies. While the benchmarking showed our plan is £100m cheaper overall than industry mean costs, we are committing to moving all the above-mean unit costs in our plan to the industry mean or lower. This is an efficiency commitment of £43m.

- We are making a stretching commitment to improve the productivity of our operating costs and the costs in our capital plan that relate to our people by 1.1% per year, almost three times the current UK productivity increase forecast. This is an efficiency commitment of £84m.
- We have benchmarked our business support costs. We will move all our support function costs to be upper quartile. This is an efficiency commitment of £29m.
- We commit to seeking to extend the application of innovative T1 solutions to address the life-limiting components of other protection and control systems. even though we do not know yet whether this is possible. We will continue to work closely with our supply chain to achieve this. This is an efficiency commitment of £27m.

These efficiencies are included in our baseline plan costs of £7,104m in two ways. We have embedded opex efficiency commitments in our bottom-up opex costs. For capital costs, we have treated them as overlays to our underlying expenditure forecast.

9. Proposals for managing price uncertainty

Protecting consumers from forecast price error

Real Price Effects (RPEs) occur where input prices are anticipated to move differently to the inflation measure by which our allowances adjust annually. This is because the mix of goods and services in the inflation calculation differs from the goods and services we purchase. The main areas where this applies are labour costs and the materials we use in our capital works, such as copper or steel.

Independent forecasts and long-term trends highlight that both labour costs and capex material costs are forecast to grow at a quicker rate than inflation over the T2 period. RPEs have a material impact on the costs we incur with 89% of our totex plan impacted by price changes that show sustained deviation from CPIH. We will therefore be exposed to above-inflation RPEs in our plan. Whilst both are anticipated to grow, the level of control we have differs, as does the potential volatility in the annual price movements.

Our staff costs track the directional trend of the relevant indices but do not fluctuate with short-term changes due to our long-term pay deals and longer-term approach to workforce resilience. The underlying indices are also less volatile than those related to commodities. Following the RIIO principle of aligning risk to the party best placed to manage it, we are therefore proposing a fixed allowance for labour RPEs based on independent forecasts of 0.3% above RPI (1.3% above CPIH). We have managed the risk of labour RPEs in the T1 period by locking in long-term pay deals.

In contrast, we have limited ability to control how capex material prices impact our cost base. Changes in input prices will be factored into all goods we purchase, and the related indices aligned to these costs are inherently more volatile than labour with, for example 20% annual cost swings in the last ten years. Although these impacts can be partially mitigated through contracting strategy, we cannot control the risk and underlying cost trend. We are therefore proposing to index our capex material costs to an industry-recognised index linked to the cost of copper which will ensure our customers and consumers pay no more or less than the relevant market based indices for these costs. In preparing our business plan, we have made a baseline assumption of 1% above RPI (2% above CPIH), based on the historic long-run average.

Our current forecasts of the impact of RPEs over and above CPIH is shown in figure 14.11 and totals £325m against our baseline T2 plan, of which £137m is subject to indexation. Moving from RPI to CPIH indexation makes the impact of RPEs more pronounced (as CPIH is typically 1% lower than RPI). Overall, after accounting for both RPEs and productivity growth, our opex input prices will still reduce by 0.6% over the T2 period (1.6% reduction RPI-equivalent). Capex input prices will increase by 3% (2% RPI-equivalent), of which 2% is based on the current view of copper prices and subject to indexation.

Figure 14.11 Our proposal to manage the risks of real price effects in the T2 period

Consideration	Plant, materials & equipment costs	Labour costs
Extent of potential price volatility	High, particularly on materials	Lower in the long term
Network's ability to mitigate RPE effects	Limited ability with outputs to deliver, procuring at market rates	More controllable through salaries
Risk of variance to forecast	High due to volatility	Lower due to duration of pay deals
	Our Proposal	Our Proposal
Approach to RPE related allowance uplift	Baseline allowance based on forecast that varies up or down with relevant indices	Ex-ante fixed allowance based on forecast with upper and lower thresholds
Forecast RPE uplift across T2 period	Capex £133m	Capex £138m
	Opex £4m	Opex £50m

We describe our assessment of Real Price Effects in more detail and provide evidence to support our approach in annex NGET_ A14.14 RPEs and ongoing efficiency.

Defining our output commitments

An important part of providing value for money is spelling out exactly what our stakeholders will receive for the money. We are making clear output commitments for as many of our costs as we can. Outputs are measurable, consumer-facing outcomes that network companies can deliver. These include meeting licence obligations and government standards. They also include service quality improvements that consumers are willing to pay for.

The benefit of defining outputs to consumers is that they are transparent. We can be held to account to deliver them. If we do not deliver an output, we expect to see consequences through our regulatory contract. By focusing on outputs, we can look for more cost-effective and innovative ways to achieve them. When we do that, we give consumers what they want at a lower cost and share any savings with them.

Adjusting our allowances appropriately through uncertainty mechanisms

Throughout this document, we have explained the uncertainties the energy sector faces over the T2 period. If we fix allowances at the start of the T2 period, there is a risk we would have too much – or too little – funding to provide what our customers and consumers want.

Our stakeholders only want us to be funded for the activities we carry out. We have therefore proposed more uncertainty mechanisms and set out how to improve the existing uncertainty mechanisms to make them more accurate. This is described in more detail in annex NGET_ET.12 Uncertainty mechanisms.

We are consulting on our uncertainty mechanism proposals with stakeholders. Ofgem will also scrutinise them when it carries out its assessment.

10. How our plan offers value for money

This baseline plan delivers more investment for the future which delivers value to consumers by ensuring a safe, reliability and resilient network as society becomes increasingly reliant on electricity in the transition to a net zero energy system. We are able to deliver this increased investment without increasing our part of the energy bill for household and business consumers alike.

We have used external benchmarks to test the efficiency of our capital unit costs, the costs of organisational functions, our IT investment costs and our staff pay, and demonstrated they are in line with or better than relevant comparators. Where they aren't, we have taken on the efficiency challenge and reduced them.

We have built into this plan the benefits of all our past successful engineering and asset management innovations that have benefitted consumers already in the T1 period, measurably reducing the costs of this plan by £707m.

Our forecast network capital costs are largely market tested as they are based on competitive procurement and result from a robust forecasting methodology and process which have been independently verified and assured. We have committed to a 'native competition' plan (on the next page) to continue to ensure we drive competition to get the best value from suppliers and contractors.

In Chapter 7 *We will enable the ongoing transition to the energy system of the future* and Chapter 8 *We will make it easier for you to connect to and use the network,* we also highlight certain projects where an alternative competitive model to NGET delivery might create value for consumers.

To ensure our customers and end consumers get the outputs they expect from these efficient costs, we are proposing a range of outputs that means we can be held to account for delivery. In Part 1 of the business plan, we also set out our consumer value proposition which outlines where we believe the proposals in our business plan deliver 'added value' for consumers that can be quantified.

We have protected consumers from errors in forecasts for the future by proposing a range of uncertainty mechanisms to ensure the price control flexes as things change in the T2 period. This ensures that our allowances and associated outputs are able to vary from this baseline plan as the needs of customers and stakeholders change going forward, and changes in external markets are reflected in our allowances.

Finally, recognising the pressure on energy bills for all our business customers and end consumers, we are stretching ourselves to commit to future efficiency improvements totalling £383m in the T2 period to keep our part of energy bills as low as possible.

OUR NATIVE COMPETITION PLAN

We utilise competitive processes for all procurements and projects, except where the potential benefits of doing so are outweighed by the costs

- We comply with the European Utilities Contracts Regulations 2016 (UCR) which require the use of competitive processes for the purchase of goods and services above a financial threshold (currently ~£363k for Goods and Services and ~£4.55m for Works).
- A competitive process is followed for purchases over £20k, with any exceptions to be authorised through appropriate delegations of authority. For all purchases greater than £100k, we follow a more defined sourcing and tendering process. This is lower than the legal threshold set by the UCR; we choose to do this because we believe we can drive more value.

Our competitive process is robust, transparent and provides equal treatment of potential bidders and protects information appropriately

- We treat all bidders fairly and with the appropriate level of transparency. Bidders need to trust us not to reveal confidential information to the market before they make their best submission and share innovations.
- We ensure confidential information is handled appropriately.
- We offer fair payment terms and participate in the Prompt Payment Code, encouraging our direct contractors to cascade these principles through all levels of the supply chain. This protects the cash flow of all parties, but particularly helps smaller businesses.
- We drive performance in our contracts by ensuring they contain appropriate measures (Key Performance Indicators) to incentivise suppliers. We measure supplier performance on a quarterly basis and the outcomes affect future workload allocation.

The complexity of the competitive process used is proportionate to the value and time-sensitivity of the project or system need in question

- Our Strategic Sourcing Process enables us to identify the optimum way to contract work taking into account the value, risk and urgency of the work. We seek opportunities to benefit from our global buying power.
- We have set up frameworks to speed up the commercial process, reduce tendering costs, drive optimal designs, leverage volume and introduce innovation. Our framework agreements allow enough flexibility to ensure that suppliers are able to introduce innovation and optimise designs whilst we remain able to leverage our volume through the workload allocation processes.
- For complex, high-value, bespoke or unusual projects where we believe we can drive additional value, we retain the option to spot tender and can allow a longer period for tender receipt than the legal minimum.

Information is provided equally to all parties, and any conflicts of interest are managed

- We will continue to provide early visibility of the work plan through quarterly webinars and issuing project briefs to enable our supply chain partners to plan more effectively. We have already shared our T2 plan through our ongoing six-monthly senior engagement forums with our key framework suppliers.
- We have appropriate checks in place to identify and manage any conflicts of interest.

We are agnostic to technology and bidder type

- We continue to drive competition into our supply chain by introducing new suppliers. We are open to innovative solutions and remain technology agnostic (where practicable).
- Our frameworks are expanding to include more options for installation-only contractors, to increase technology agnosticism by decreasing our reliance on equipment manufacturers.

Competition is structured to generate outcomes in the interests of current and future consumers

- We constantly work to increase efficiency, mitigate risks and optimise whole-life costs. We have a lead role in the Institution of Civil Engineers Infrastructure Client Group; as part of this, we are an early adopter of Project 13 principles for our LPT2 project which emphasises the importance of delivering broader outcomes to benefit the local community and consumers.
- We leverage value by being a better client, regularly seeking feedback from our supply chain as to how we can help them be more efficient, which in turn leads to lower costs and better outcomes for customers and consumers.