



Unit Cost Process Review

Assurance of process for RIIO-ED2 Business Plan Submission

Western Power Distribution

03 November 2021



The Power of Commitment

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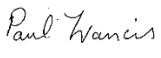
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Executive Summary

GHD has been appointed by Western Power Distribution (WPD) to perform an independent review of the WPD approach to deriving unit costs for inclusion within its RIIO-ED2 Business Plan and to provide an independent assurance of the WPD approach. WPD wishes to assure its stakeholders that a suitable methodology has been applied to establish unit costs that are typically representative, accurate and efficient.

In order to confirm if the methodology/approach employed by WPD in developing its unit costs for the RIIO-ED2 Business Plan is reasonable this assessment has been undertaken in three-parts, as set out below:

1. We have undertaken a review of the procurement processes, governance, approvals, and delivery models adopted for the purchase and installation (replacement) of assets (Section 3).
2. A review of the processes, source data and methodology adopted by WPD to extract, review, and set unit costs for RIIO-ED2 (Section 4).
3. A review of the proposed RIIO-ED2 unit costs proposed by WPD for a representative sample of assets (four). This review includes an assessment of the reasonableness of specific assumptions made in determining the unit costs for each of the four assets and whether the proposed WPD unit costs are within the bounds of GHD expected unit cost range for equivalent assets.

Review of procurement processes

WPD has a robust tender process that has been audited by CIPS and demonstrates a segregation of duties (as outlined in its Policy LO3 documentation). The adoption of a centralised structure across its Licence areas and a competitive tendering process are in line with our expectations of a DNO of the scale of WPD and such an approach enables WPD to achieve competitive quotations.

GHD is of the opinion that WPD has the processes in place to ensure that goods and services are acquired at best value. Furthermore, WPD also has the systems in place to capture and manage its resulting unit cost data via its charging and estimating systems (CROWN) alongside other important data tools such as the contract data tool Contiki.

Process for unit cost development

Although not documented, GHD considers that the overall approach implemented by WPD to calculate its proposed unit costs for all asset types, is sufficiently robust. WPD implements a transparent bottom-up approach to identify the component parts used in the development of unit cost data, with assumptions and data sources clearly identified. Our assessment of the cost build identified a prudent and pragmatic approach is used in identifying the various input resources and volumes used in the unit cost calculation. The internal review / consultation process provides a “closed-loop” system - this ensures that the input from relevant business departments is captured and fed into the determination of final unit cost values for RIIO-ED2.

The Estimating & Charging Package is the main data source for component costs used in compiling unit costs. This is regularly updated with latest contract price information for materials held within WPD procurement system. This ensures that the selected costs are consistent with efficiently procured contract data.

As the latest cost information is used for unit cost purposes, WPD do not include any price escalation for real price effects (RPEs) as any potential RPE impact is considered by WPD at a broader business level rather than within the unit cost for any specific asset type.

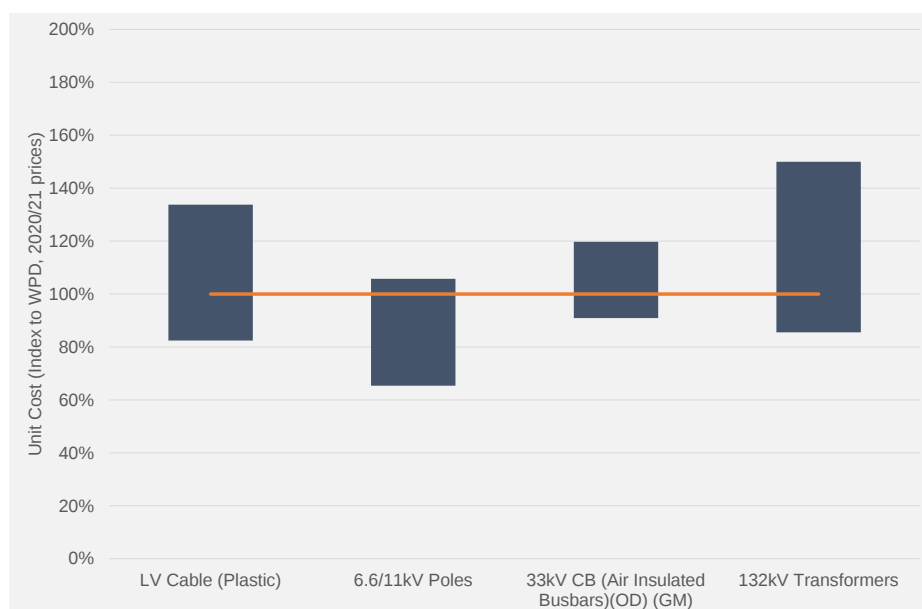
WPD has a range of methods in operation that are used to inform their RIIO-ED2 unit cost data validation exercise, making good use of available data within their organisation and from other external sources.

The data sources give added assurance to GHD that the unit costs developed for RIIO-ED2 are subject to sufficiently robust internal checks and review prior to them being signed off.

Sample assessment

We have undertaken a high-level benchmarking exercise of the four sampled assets to assess whether the proposed WPD unit costs are within the bounds of GHD's expected unit cost range for equivalent assets. The findings of this analysis are presented below. The orange line represents the WPD unit costs provided to GHD in October 2021, whilst the blue bars represent the range of unit costs for those assets from GHD's unit cost database. All data has been unitised relative to the WPD unit cost.

WPD proposed unit costs versus database



GHD has reviewed specific assumptions relating to the composition of unit costs and assumptions for all components of the four assets sampled and is satisfied that the data reflects the process discussed with WPD. In relation to the specific unit costs assessed, GHD is satisfied that, based on our own database, the unit costs appear within the bounds of reasonableness. The explanations provided by WPD and resulting unit costs for each asset are typical, accurate and efficient.

Concluding statement

We can confirm that the process and approach adopted by WPD in determining its unit costs data for asset replacement for input into its RIIO-ED2 Business plan is robust and reasonable. Specifically, we can confirm that:

- 1** WPD's approach to unit cost development is sufficiently robust to identify all input resources that need to be considered.
- 2** WPD has taken appropriate steps to optimise the quality of input resources required for each unit (e.g. grade of materials / labour).
- 3** WPD has deployed a suitable approach to quantifying the volume of input resources needed for each unit (e.g. number of input units required).
- 4** WPD has deployed a suitable approach to forecasting the price of the input units.
- 5** WPD operates to acquire input resources at best value.

Further, in relation to the specific unit costs of the four samples assets, ***GHD is satisfied that, based on its own database, the proposed unit costs appear within the bounds of reasonableness and align with the findings regarding the five statements above.*** As such, based on the audit procedures assessed and information provided by WPD, the unit costs for the sampled assets are considered typical representative, accurate and efficient.

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1. Introduction

1.1 Purpose of this report

GHD has been appointed by Western Power Distribution (WPD) to perform an independent review of the WPD approach to deriving unit costs for inclusion within its RIIO-ED2 Business Plan and to provide an independent assurance of the WPD approach. WPD wishes to assure its stakeholders that a suitable methodology has been applied to establish unit costs that are typical, accurate and efficient.

The purpose of this report is to explain (at a high-level) the processes/methodology in place and give our opinion on the robustness of the process.

1.2 Scope and limitations

This report has been prepared by GHD for WPD and may only be used and relied on by WPD for the purpose agreed between GHD and WPD as set out in this report.

GHD otherwise disclaims responsibility to any person other than WPD arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

This assurance review was conducted remotely using MS Teams and WebEx facilities with screen sharing functionality.

1.3 Assumptions

In our review we have relied on the WPD staff to share accurate and representative data, insight, and information in relation to the unit costs process adopted for their RIIO-ED2 Business Plan. WPD has provided access to view systems, documentation, and calculations to allow GHD to access/understand the processes within the bounds of the agreed scope.

1.4 Appreciation

We would like to express our appreciation to the WPD team for their professionalism and support in this review.

2. Unit cost process assessment

In preparing its RIIO-ED2 Business Plan, WPD has established unit cost prices for a broad range of asset management activities. These include unit costs for asset replacement for more than 100 asset types (defined by Ofgem). The unit costs are a significant input to the RIIO-ED2 Business Plan Costs & Volume forecast, based on multiplying unit cost by forecast volume for each asset type.

WPD wishes to assure its stakeholders that a suitable methodology has been applied to establish unit costs that are typical, accurate and efficient. WPD also required an independent assurance approach that was both practical to host and deliver within a limited timeframe, with a focus on assuring that:

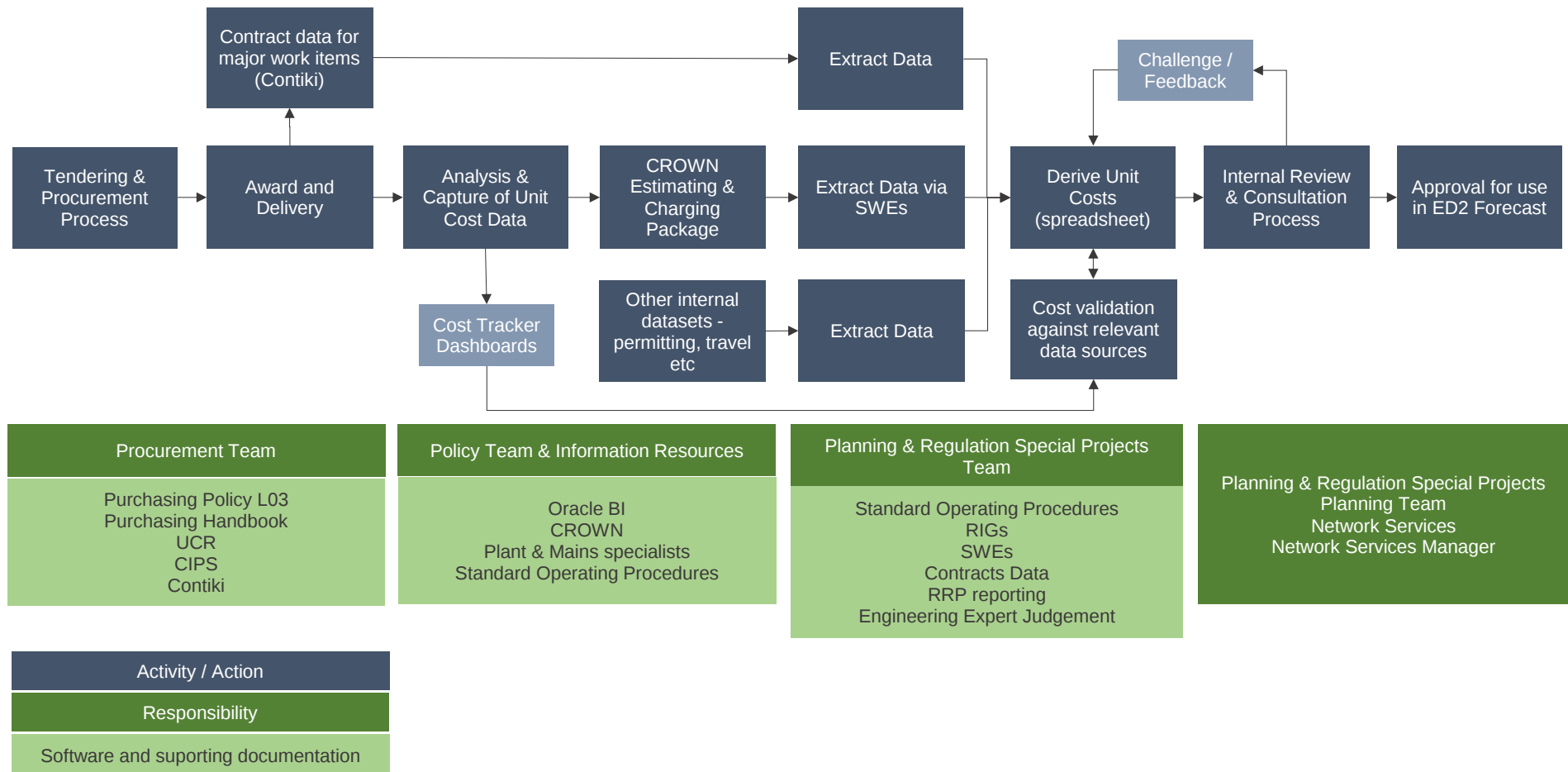
- 1** WPD's approach to unit cost development is sufficiently robust to identify all input resources that need to be considered.
- 2** WPD has taken appropriate steps to optimise the quality of input resources required for each unit (e.g. grade of materials / labour).
- 3** WPD has deployed a suitable approach to quantifying the volume of input resources needed for each unit (e.g. number of input units required).
- 4** WPD has deployed a suitable approach to forecasting the price of the input units.
- 5** WPD operates to acquire input resources at best value.

We understand that the WPD approach to developing its unit costs for RIIO-ED2 is primarily underpinned by contracted and outturn data that has been tendered and procured by WPD in previous years.

This data is subsequently stored, managed and analysed by WPD across a number of systems/software applications. When unit costs are required, the data is subsequently extracted from these systems for interpretation, analysis, comparison, adjustment, and review by WPD. All unit cost data is subsequently reviewed and challenged via an informal internal consultation process across the business before being submitted for use in the RIIO-ED2 cost and volumes analysis for asset replacement activities.

Figure 1 provides a high-level overview of the approach adopted by WPD, the general responsibility within WPD for each activity and key guiding documentation and principles.

Figure 1: Overview of WPD Approach to Deriving Unit Costs for RIIO-ED2 (representation)



In order to confirm if the methodology/approach employed by WPD in developing its unit costs for the RIIO-ED2 Business Plan is reasonable (whilst achieving the objectives set out by WPD) this assessment has been undertaken in three-parts, as set out below:

4. We have undertaken a review of the procurement processes, governance, approvals, and delivery models adopted for the purchase and installation (replacement) of assets (Section 3).
5. A review of the processes, source data and methodology adopted by WPD to extract, review, and set unit costs for RIIO-ED2 (Section 4).
6. A review of the proposed RIIO-ED2 unit costs proposed by WPD for a representative sample of assets. This review includes an assessment of the reasonableness of specific assumptions made in determining the unit costs for each of the four assets and whether the proposed WPD unit costs are within the bounds of GHD expected unit cost range for equivalent assets¹ (Section 5).

The four assets sampled are:

- LV Cable (Plastic)
- 6.6/11kV Poles
- 33kV CB Outdoor Air Insulated
- 132kV Transformers

The chosen assets provide a representative view across the voltages and asset types with reasonable volumes of replacement expected in the RIIO-ED2 period.

To assist our review, GHD issued a set of initial questions and a request for documentation to WPD for consideration ahead of meeting with the responsible persons. GHD subsequently met with the responsible persons in WPD to discuss the documentation received, the questions set, the processes adopted and to explore live systems, software, and worksheets.

The responses to our questions alongside our interactive discussions with WPD have formed the basis of our review findings, observations and conclusions that are set out in this report.

The purpose of this report is to explain the processes/methodology in place (at a high-level) and give our opinion on the robustness of the process.

GHD observations and conclusions are highlighted throughout the report in coloured text boxes.

¹ Anonymized unit cost range data based on confidential data gathered by GHD from a range of UK and international tenders that we have data on.

3. Review of procurement processes

The procurement of goods and services is a key activity for any network-orientated business. The information garnered from the tendering of and the delivery of projects, assets, labour etc can be hugely powerful for the business – none more so than in relation to cost and volume data – where historical data and trends are to be used as a key component to the derivation of future unit costs. It is therefore important that WPD's procurement processes are clearly defined, managed and sufficiently robust to ensure that goods and services can be and subsequently are acquired at the 'best value' to the business and ultimately the customer.

As part of our assessment of the WPD procurement process, we have sought to:

- Review process documentation relating to:
 - Procurement processes for network activities,
 - Internal governance, and
 - Approval of procurement activities in relation to asset replacement.
- Discuss delivery models including the decision-making process for different types of asset replacement works (e.g. in house labour / free-issue materials v full turnkey project delivery), how WPD decides on its proposed delivery model for different asset works and understand what analysis is undertaken to support decisions on the preferred delivery model.
- Understand what specific delivery model(s) are assumed in the unit costs for the four specific (sampled) asset types and whether WPD has updated its delivery models for its RIIO-ED2 Business Plan.
- Understand how WPD procurement / tender evaluation / Best and Final Offer (BAFO) processes ensure that WPD procures services that provide value/best value.

3.1 Process and documentation

WPD's procurement processes are certified by the Chartered Institute of Procurement and Supply (CIPS). GHD understands that certification by CIPS (the Procurement Excellence Standard Award) has been in place since 2011 and certification was recently renewed in July 2021 for a further two years. Certification to CIPS gives confidence that the WPD procurement processes have been independently verified. Holding certification since 2011 adds further confidence that procurement processes have been well-established for a number of years leading to a strong and reliable historic data set upon which to draw unit cost data from.

Documentation is available that clearly sets out the processes, internal governance and approval procedures relating to WPD's tendering and procurement activities. In our discussions with WPD, the following documentation (Table 1) has been provided to GHD.

Table 1: Procurement process documentation provided

Documentation	Purpose
Purchasing Policy L03	Company Directive that specifies the WPD policy on acquiring good and services, setting out company objectives to add value and deliver to the business plan. The document sets out responsibilities, procedural requirements, and approvals processes to form a suite of process documentation within WPD.
CIPS Procurement Excellence Programme	Document that defines the CIPS Standard award for Procurement Excellence. Organisations that demonstrate that they meet the criteria within the Standard award shall be awarded a certificate of recognition. Meeting the Standard award criteria demonstrates that the procurement policies, strategies, procedures, and processes will provide good practice and consistent ways of working; this should also reduce the likelihood of any fraudulent activities within procurement and its supply chain.
CIPS Final Report 2021	Detailed assessment report for July 2021 certification attainment by CIPS.
CIPS Certificate	Certification of achievement of CIPS, dated July 2021. A certificate has been held by WPD since 2011.

Documentation	Purpose
Purchasing Handbook	Copies of D1 Prequalification, D2 Invitation to Tender, D3 RFQ or Mini Competition Process, D4 Negotiation & PTN and D5 Contract Approval & Award provided. Each policy document sets out the processes and procedures for the respective stages of WPD's procurement activities.
C2 EU Regs Summary	The EU Procurement Directives set out the legal framework for utilities procurement and is governed by The Utilities Contracts Regulations 2016 (UCR 2016). They set out procedures which must be followed before awarding a contract when its value exceeds set thresholds unless it qualifies for a specific exclusion. This is embedded within WPD's procurement processes.

We have found approvals/governance arrangements are in place for procurement activities, with appropriate levels of delegated authority assigned (from 'buyers' with authority to sign off purchases up to £2m, gradually increasing through senior buyer, managers, logistics managers to the Operations Director with delegated authority of all purchases of £15m or more).

The contract management system for the award of all contracts is audited each month to ensure best practice, delegated authority and WPD procurement policies are followed.

WPD has a suite of process documentation that clearly sets out the approach, responsibilities and actions required of the WPD procurement team to acquire goods and services at best value – as confirmed by CIPS certification.

3.2 Tendering & delivery

WPD's procurement team is organised centrally, transgressing responsibility across its four licences. Within the procurement team (comprised of approximately 20 staff at the time of this assessment) there are four senior buyers (responsible for goods and plant (x1), major projects (x1) and other services (x2)) supported by four 'buyers' and further additional procurement and tendering staff.

Procurement for goods and plant (most relevant to asset replacement activities) is undertaken as a single activity across all four licenses - although it is noted that regionalised pricing/costing can be found for the provision of some goods and plant.

As with all UK DNOs, the Achilles vendor database is used to ensure only appropriately qualified companies are invited to bid.

GHD understands that WPD acquire assets using a tender and contract award procedure for all asset types in line with the Utility Contract Regulations (UCR) procurement regulations, supported by contracted labour for specialised or non-core activities.

With regard to specific assets, cables, poles and circuit breakers are all tendered and awarded on a contract price for call-off. 132kV transformers are awarded on a mini-competition basis, whereby WPD has 4 contracted suppliers in place and each time there is a requirement, a competitive process is implemented to find the most economically advantageous supplier. Contracts typically run for a period of four years initially but can be extended to a maximum of eight years (via two two-year extensions). Under these frameworks, no supplier is guaranteed a minimum volume of work.

In terms of delivery models, WPD has informed GHD that a 'Turnkey' delivery model is rarely used. WPD places contracts for all asset types and these are ordered and delivered to site. It then uses either in-house labour or sub-contract labour for specific activities. In general, WPD try to use their own labour wherever they can and have their own fitters, jointers, overhead linesman, and technicians etc. Where labour is sub-contracted, this is usually as a result of a tender process and awarded contract. Examples of sub-contract labour include excavation and cable laying, vegetation management, sub-station civils, sub-station electrical install and pole planting. We understand that some asset types also include an installation and 'cold' commissioning service element to them (for example switchgear).

We understand from our discussions with WPD that there are no planned changes regarding how goods and services are procured moving from RIIO-ED1 to RIIO-ED2.

GHD considers the approach adopted to tendering and the delivery models adopted by WPD to be reasonable and relatively standard practice within the industry (noting companies have flexibility in how they operate).

The approach to tendering and procurement is competitively based but centrally focussed and this should ensure that the supply and delivery of materials and/or labour across the four licences is of the requisite quality/grade and the fees paid are competitive and can be achieved at best value.

3.3 Data

Contracted assets with a contract price are created and setup in WPD's Purchase to Pay system (Contiki) with components each given a code to ensure data can be amalgamated. Cost and volume data is captured at localised levels which allows for the disaggregation and rolling-up of data to suit WPD analysis requirements. The data is updated automatically each month.

The contract prices are automatically fed into WPD's estimating and charging package known as CROWN (via component codes) which are subsequently used in the estimation of unit costs for RIIO-ED2. The CROWN package is reviewed and updated periodically (discussed in more detail in Section 4).

3.4 Conclusions

WPD has a robust tender process that has been audited by CIPS and demonstrates a segregation of duties (as outlined in its Policy LO3 documentation). The adoption of a centralised structure across its Licence areas and a competitive tendering process are in line with our expectations of a DNO of the scale of WPD and such an approach enables WPD to achieve competitive quotations.

GHD is of the opinion that WPD has the processes in place to ensure that goods and services are acquired at best value. Furthermore, WPD also has the systems in place to capture and manage its resulting unit cost data via its charging and estimating systems (CROWN) alongside other important data tools such as the contract data tool Contiki. These systems are discussed in further detail in Section 4.

4. Process for unit cost development

4.1 Background

GHD developed a list of questions issued to WPD ahead of our scheduled meetings with the questions focused on gaining a better understanding of the WPD process in use to develop its unit costs for planned asset replacement works in the RIIO-ED2 period. Specifically, as part of our assessment, we have sought to:

- Seek a more detailed understanding of the process (supported by documentation where possible) relating to internal governance and approval of unit cost data used for the RIIO-ED2 submission.
- Clarify the overall process for management of unit cost data used for asset replacement.
- Understand the cost input resources used within the process, specifically the Estimate and Charging package used for higher volume HV and LV asset works:
 - i. The scope of detail included in the package,
 - ii. The process and regularity for updating,
 - iii. How the data is managed, and
 - iv. How the data/package is used within the RIIO-ED2 unit cost submission.
- Clarify WPD's approach to identifying all input resources that are considered in the determination of unit costs for asset replacement.
- Understand the steps WPD has taken to optimise the quality of input resources required for each unit (e.g. grade of materials / labour).
- Clarify WPD's approach to quantifying the volume of input resources needed for each unit (e.g. split of input resources).
- Understand the WPD process for analysing historic cost data and how it is validated for use in the RIIO-ED2 submission.
- Clarify how WPD forecast unit costs for RIIO-ED2 compare with outturn costs for RIIO-ED1 and what drivers are impacting on forecast unit costs.
- Determine what escalation for Real Price Effects is included with forecast unit costs and how has this been calculated.
- Clarify the specific delivery model(s) that are assumed in the unit costs for the four specific (sampled) asset types.
- Understand how the available procurement data (contracted/outturn) feeds into the unit cost database/dataset.
- Understand how recorded historic procured cost data (and outturn cost data if applicable) is stored, managed, extracted, and used in the determination of unit cost estimates for the RIIO-ED2 Business Plan.

Following our review of the above, our comments and observations are presented in the sub-sections below.

4.2 Description of WPD's overall approach

As part of their RIIO-ED2 submission, WPD is responsible for submitting its costs and volumes targets for its planned asset replacements. This involves the collation of unit costs for more than 100 asset types, as required by Regulatory Reporting.

During RIIO-ED1, WPD has reported its outturn process against its asset replacement costs & volumes allowances. WPD's approach for preparing its unit costs for RIIO-ED2 is broadly similar to the approach used in RIIO-ED1, although we note that WPD has increased its engagement with its own operational teams for input and review.

Whilst the overall process for the preparation, management and approval of unit cost data is not documented within an internal procedure / policy document, we were provided with a robust explanation of the detailed process implemented within WPD, as summarised in Figure 1.

The responsibility for the preparation of unit costs is managed by a single person within the organisation, with in depth knowledge of the asset types, how the unit costs are built up for each asset type and regulatory definitions of what is included in the scope of for each asset type.

For each asset type, WPD adopts a bottom-up approach, whereby each of the different input resources required to deliver and install an asset “unit” are separately identified and quantified. For example, the components used in the compilation of unit cost data for replacement of low voltage underground cable (LV-UG cable) using plastic cable is summarised within Figure 2 below.

Figure 2: WPD Components used in calculation of Unit costs for Asset Type “Replace LV Mains UG (Plastic)”

Asset Component	Units	Initial Unit	Percentage Occurance	Final Quantity
Supply - LV 4 Core 300mm ² Wavecon cable	m	1000	100.00%	1000
Supply Plastic marker tape	m	1000	100.00%	1000
Supply - 4 Core wavecon to 4 core wavecon 300mm ² (7.109 MS 15)	ea	15	100.00%	15
Install - 4 Core wavecon to 4 core wavecon 300mm ² (7.109 MS 15)	ea	15	100.00%	15
Supply - 300mm ² Wavecon Branch Joint (7.402 MB3)	ea	5	100.00%	5
Install - 300mm ² Wavecon Branch Joint (7.402 MB3)	ea	5	100.00%	5
2.32 FOOTWAY FLEXIBLE INSTALL HV OR LV CABLE	ea	800	100.00%	800
2.82 RDWAY TYPE 3&4 INSTALL HV OR LV CABLE	ea	200	100.00%	200
3.04 FOOTWAY FOOTWAY FLEXI HOT ROLL JT2A	ea	20	100.00%	20
5.05 ALL ADD APPLIED(5.01-5.03)ADD CABLE/TUBE/DUCT SAME TRENCH	ea	200	100.00%	200
Allowance for costs associated with permit scheme requirements	km	1	100.00%	1
Streetworks Permits & Fines	km	1	100.00%	1
LV network operations	man hrs	10	100.00%	10
Travel (man hours)	man hrs	6	100.00%	6

For each of the 100+ asset types, the build-up of unit costs, using these components, is detailed within file “**ED2 Updated Unit Cost Derivations V7.xlsx**” (hereafter termed the “**WPD ED2 Asset Replacement Unit Cost DB**”), from which WPD provided GHD with detailed extracts relating to the selected asset categories.

As can be seen from the figure above, the detailed component cost build also identifies the proportion of each component used on a per unit basis. For example, for pole installation, it is important to separately identify proportion of assumed poles of different type (e.g. intermediate / light angle pole, heavy angle pole, section or terminal pole) that are used in the development of a unit cost for a single pole.

The component build up used in the unit cost and the assumed proportion of each component rely upon expert judgement, supplemented by historical information and feedback from WPD network management staff.

Within the WPD RIIO-ED2 Asset Replacement Unit Cost DB, unit costs are identified for each component. These unit costs use a range of data sources, identified as follows:

- Standard work elements (SWEs) – which are included within the WPD Estimating and Charging Package (CROWN);
- Specific purchase contracts for some larger assets; and
- Manual estimates (for example permits, indirect works).

The unit costs for HV & LV cables, poles, and HV & LV plant (both transformers and switchgear) are developed mainly using the SWEs. The SWEs include latest material costs together with standard hours for skilled labour to undertake the “component” activity.

For 33kV & higher voltage equipment, the data source is more varied, using some SWEs, but also using recent contract data for procured works and some manual estimates for minor items. We observed the used of contract data for one component within the unit cost for 33kV circuit breaker which was based on costs contained within WPD Contiki purchasing / procurement system.

Once the unit costs for each asset type have been compiled, using this bottom-up approach, the process then involves a detailed review/challenge/feedback process internally within WPD, involving engineers and managers from the different delivery teams across the WPD business.

WPD provided evidence to GHD demonstrating this consultation process in operation, with email examples from earlier in 2021 being provided, together with embedded comments from consulted staff evident within the WPD RIIO-ED2 Asset Replacement Unit Cost DB.

In terms of the WPD overall process for approvals, it is our understanding that such approval, or “business sign-off” is based on the overall asset replacement “Costs & Volumes” plan, rather than a specific sign-off for the unit costs themselves.

Approval of the costs & volumes for RIIO-ED2 implicitly provides approval of the unit costs used in the “Costs & Volumes” forecast.

Although not documented, GHD considers that the overall approach implemented by WPD to calculate its proposed unit costs for all asset types, is sufficiently robust.

WPD implements a transparent bottom-up approach to identify the component parts used in the development of unit cost data, with assumptions and data sources clearly identified.

The delivery model operating in WPD is predominantly in-house with major items of equipment procured on an as-needed basis. No projects or works are delivered using a turnkey delivery model. The composition of component costs in the unit cost calculation is consistent with this delivery approach.

Our assessment of the cost build identified a prudent and pragmatic approach is used in identifying the various input resources and volumes used in the unit cost calculation. We did not identify any obvious “over-stating” of component volumes and no provisions were included for unknown project “contingencies”, both of which would potentially result in an over-stated unit cost.

The internal review / consultation process provides a “closed-loop” system - this ensures that the input from relevant business departments is captured and fed into the determination of final unit cost values for RIIO-ED2.

The components used in calculating unit costs are consistent with the RIGs², such that:

- Civil costs are estimated but then removed from the calculation and reported separately.
- Costs will typically include dismantling/disposals where deemed necessary.

4.3 Use of CROWN “Engineering & Charging Package”

WPD uses the CROWN Engineering & Charging Package (ECP) for compiling unit costs for HV & LV asset types, and some components of EHV & 132kV asset types. The CROWN system also has a much broader use than compiling unit costs, including preparation of scheme costs for reinforcement projects and network extension for new connection projects. SWEs (as discussed above) are a product of the CROWN system.

Within the ECP, for each SWE, we observed the background data, used to determine SWE cost, linked to procurement system commodity codes. An example is provided in Figure 3 below.

² RIIO-ED2 Business Plan Data Template – Glossary – Section 4: Asset Replacement Scope of Works

Figure 3: Example of Background Data held in CROWN To Build Up SWE

A	B	C	D	E	F	G	H	I
ID PAR	SWE PARENT	STAND	SWE	MATERIAL	COMMODITY CODE	UNIT C	UNIT S	UNITS
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	TERM SECT STRAP HVY	30469	11.89		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	230MM INSULATOR PIN	30441	6.12		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	CROSSARM 2900MM LONG 100X75X12 BSUA ESI 43	30402	61.81		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3017	Dress Erect Heavy Pole Grp A - Single					
2203	Erect Heavy Pole Group A - Single (intermediate	3016	Erect Erect Heavy Pole Grp A - Single					
2203	Erect Heavy Pole Group A - Single (intermediate	3015	Dig hole Erect Heavy Pole Grp A - Single					
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	11KV PIN INS POLY	50447	4.15		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	M20 X 750 GALV BOLT & NUT, THREADED TO 150M	36943	3.45		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	1300MM STAY BLOCK	30091	17.86		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	WASHER, SQUARE (FLAT) FOR M20 BOLT ESI 43960	30523	0.19		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	WASHER, SQUARE (CURVED) FOR M20 BOLT ESI 43	30522	0.34		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	11.0 METRE STOUT WOOD POLE	30075	294.94		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	GALV. NUT AND BOLT, M20 X 60, SCREWED 46	30116	0.86		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	GALV. NUT AND BOLT, M20 X 300, SCREWED 150	30124	1.51		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	STRUT CROSSARM 750MM L, 65X50X8 BSUA ESI-43	30473	7.9		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	INSULATOR BRACKET (HV) TO ESI DRAWING 43951	30145	5.92		1 EACH
2203	Erect Heavy Pole Group A - Single (intermediate	3014	Supply - Heavy Pole Group A - Single	GALV. NUT AND BOLT, M20 X 360, SCREWED 150	30125	1.97		1 EACH

For the highlighted SWE parent in the above table (relating to an 11m stout wood pole), we were able to reconcile the unit cost against the purchased material cost held within the WPD procurement system, giving us additional assurance that the data used is the most recent and most accurate cost for derivation of unit costs.

The SWE cost data, linked to the procurement system commodity codes, is updated monthly (automatically) with manual checks carried out by WPD to trace any fluctuations – as either genuine or errors – these can then be verified.

In addition, the WPD Plant & Mains (“policy”) team are responsible for carrying out a periodic review of data contained within the CROWN system; this includes data relating to the SWE costs, both materials and standard hours included for carrying out specified activities.

The unit costs built in to the ECP cannot be altered, they are based on procured material costs and standard labour hours for completion of defined activities. However, extra components can be added when creating a new SWE to cater for an activity not including within the ECP.

The Estimating & Charging Package is the main data source for component costs used in compiling unit costs. This is regularly updated with latest contract price information for materials held within WPD procurement system. This ensures that the selected costs are consistent with efficiently procured contract data.

The Package is a reliable source of unit cost data for all LV & HV asset types. This ensures the same data source is used on a consistent basis.

For some of the EHV & 132kV assets, SWEs within the CROWN ECP are used as component parts in the cost build up for these unit costs. For the major assets used at these voltages (e.g. 132/66kV 90 MVA transformer) – component cost data is used from specific contracts, rather than the ECP. This also ensures that the most recent available information is used on a consistent basis.

As the latest cost information is used for unit cost purposes, WPD do not include any price escalation for real price effects (RPEs) as any potential RPE impact is considered by WPD at a broader business level rather than within the unit cost for any specific asset type. This approach is evident from our review of the cost build up used to calculate unit costs and is reasonable.

Although the cost data available within CROWN ECP has not been subjected to independent external assurance or verification, it is our understanding that it is also used for calculating connection chargers for new connection applications. Given that these charges are used in the determination of the WPD connection margin and that there is open competition in the contestable works associated with new connections, these factors provide some form of implicit assurance that the cost data with the CROWN ECP is reasonable.

4.4 Management & tracking of Unit Cost Performance

As part of our methodology, we sought to understand WPD's approach to validating its unit costs that they have proposed for RIIO-ED2. We understand that WPD use four different methods for monitoring RIIO-ED1 unit cost performance and for validating its proposed RIIO-ED2 unit costs. These are:

- “Trackers” and “Dashboards” to monitor unit cost performance during the current RIIO-ED1 period.
- Assessment of unit cost relative to Ofgem Expert view.
- Assessment of unit cost relative to other DNOs based on use of shared data within DNOs annual Regulatory & Reporting Pack (RRP).
- “Sense-check” comparison of RIIO-ED2 unit costs against RIIO-ED1 outturn costs (both WPD outturn & other DNO outturn).

Each of these are discussed in the subsections below.

4.4.1 RIIO-ED1 unit cost tracking

The monitoring is carried out across all asset types, using the Oracle BI system, structured to track unit costs achieved (outturn) versus Ofgem allowed.

The tracking of unit cost performance is available on a multi-level basis, with the highest level reporting on a fully aggregated view across each Licence area for all asset categories (example screenshot in Figure 4 below), down to a very detailed view at individual asset type level, for a depot area within each of the four WPD's licenced areas (example screenshot in Figure 5 below). This level of granularity is of obvious use at different levels within the organisation.

Figure 4: Asset Replacement Unit Cost OBIEE Dashboard

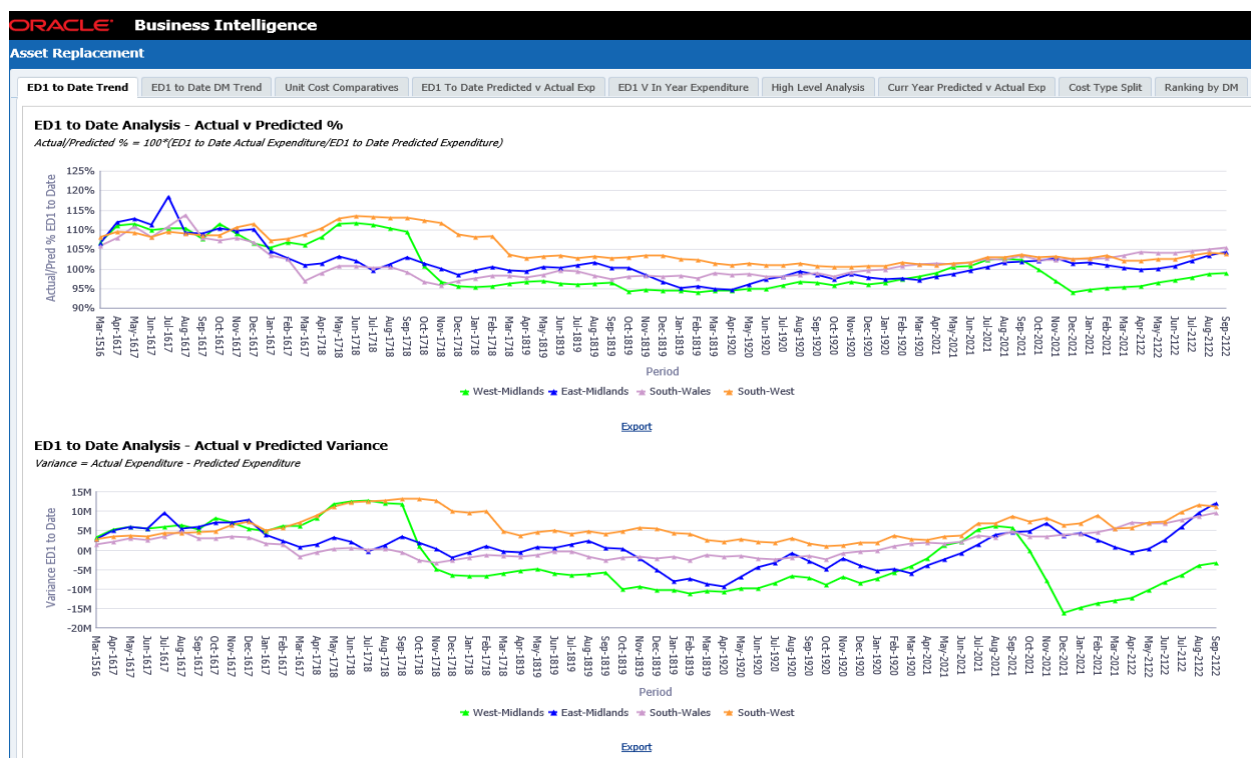
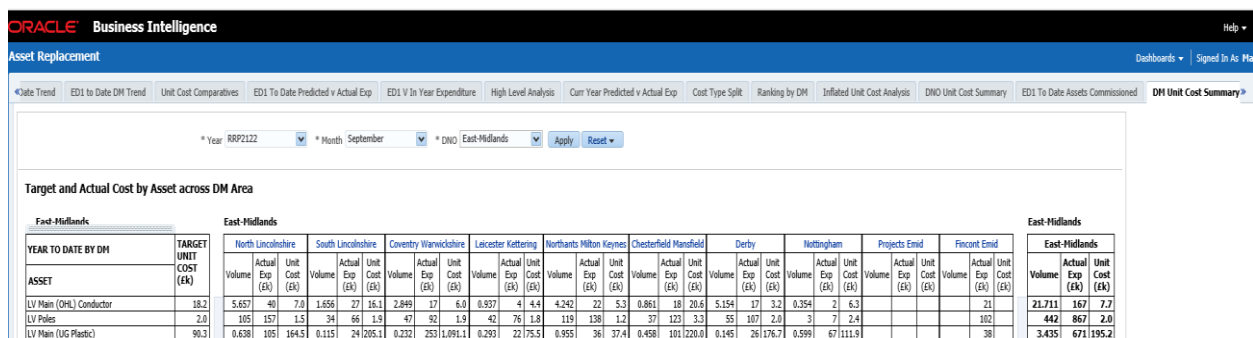


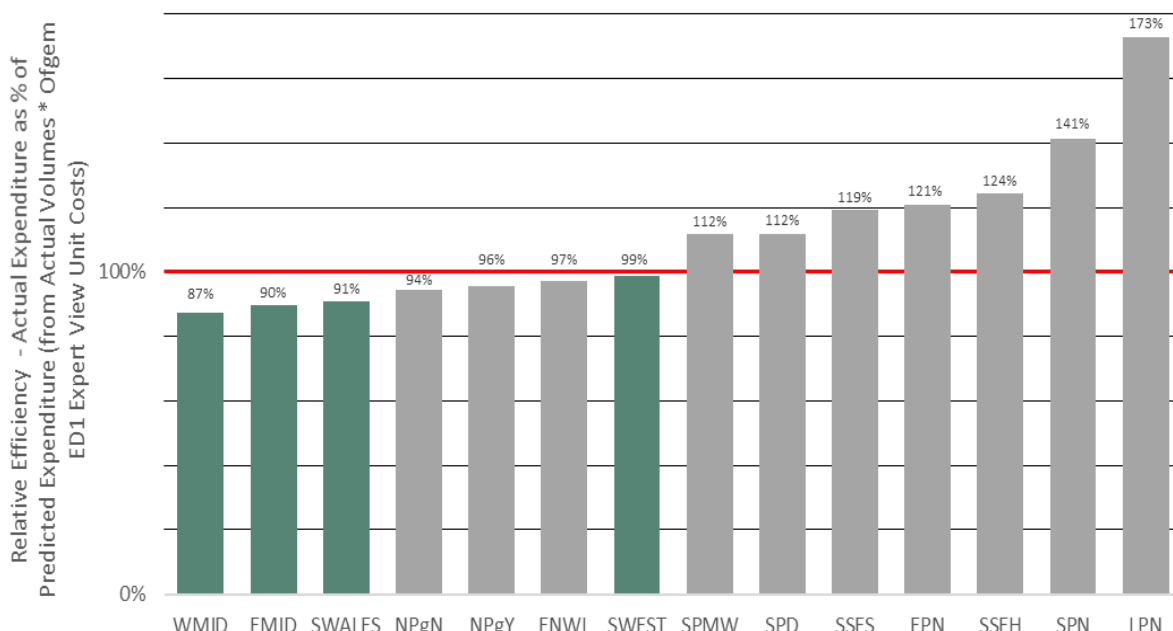
Figure 5: Asset Replacement Unit Cost Dashboard (Localised Level)



4.4.2 Comparison with Ofgem “Expert View”

In addition to the tracking of its RIIO-ED1 unit cost (and volume) performance, WPD also undertakes its own comparison of its unit cost data relevant to the Ofgem “expert view” used in setting RIIO-ED1 allowances and is able to rank itself against other DNOs³. Figure 6 below presents WPD’s assessment of its unit cost efficiency relative to other DNOs, with the red line representing Ofgem’s expert view of efficient unit costs. It is noted that the analysis shown below is for the four-year period of RIIO-ED1 up to and including 2018/19.

Figure 6: WPD comparison of DNO efficiency of Asset Replacement Delivery (2015/16 to 2018/19)



The above analysis, carried out by WPD, indicates its unit cost performance is lower than Ofgem’s “expert view” in all Licence areas at that time.

4.4.3 Annual outturn review against DNO performance on all assets undertaken each year.

Figure 7 below shows an example of the analysis undertaken by WPD to assess its delivered RIIO-ED1 unit cost efficiency ranking relative to other DNOs. In this example, the selected asset type is HV overhead line poles.

We note WPD’s ranking based on its own analysis, illustrated in the above table and we have provided further commentary relating to the unit cost for this asset type within Section 5 below.

³ E.g. DNO actual Asset Replacement expenditure as a proportion of the predicted expenditure if the actual delivered volumes had been delivered at the ‘Ofgem Expert View’ asset replacement unit cost (determined from Ofgem’s cost efficiency assessment of RIIO-ED1 BPDTs).

Figure 7: Example of DNO Unit Cost Efficiency Ranking during RIIO-ED1 ⁴

	A	B	C	D	E	F	G	H	I	J	K	L	O	P	Q	R	S
1	Unit cost analysis (£ nominal)																
2																	
3	Select ----> Overhead Pole Line 6.6/11kV Poles HV																
4	Adjust to 12/13 prices -- yes																
5																	
6	UNIT COSTS (£)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021					
7	WMID BP	1,312	2,956	2,540	2,991	2,632	2,624	1,911	1,861	1,516	2,241	2,075	DR5	DR5&ED1	ED1 Unit cost	Rank ED1	
8	EMID	1,379	2,476	3,425	2,617	2,512	2,114	1,865	1,948	1,894	2,332	2,127		2,634	2,264	2,022	
9	SWALES BP	1,890	1,550	1,906	1,963	2,018	1,842	1,714	1,833	1,797	1,853	2,145		2,560	2,261	2,025	
10	SWEST	2,067	1,680	2,241	2,608	3,171	2,300	2,125	1,997	1,872	1,880	1,940		1,861	1,850	1,842	
11	ENWL													2,311	2,151	2,017	
12	NPGN																
13	NPGY																
14	LPN																
15	SPN																
16	EPN																
17	SPD																
18	SPMW																
19	SSEH																
20	SSES																
21	WMID BP	1,312	2,956	2,540	1,796	1,823	1,829	1,830	1,827	1,831	1,835	1,840		2,010	1,874	1,835	
22	EMID BP	1,379	2,476	3,425	1,797	1,824	1,831	1,833	1,830	1,833	1,836	1,840		2,013	1,877	1,837	
23	SWALES BP	1,890	1,550	1,906	1,812	1,847	1,851	1,851	1,846	1,849	1,852	1,856		1,796	1,833	1,853	
24	SWEST BP	2,067	1,680	2,241	1,813	1,849	1,851	1,852	1,848	1,851	1,855	1,858		1,909	1,875	1,855	
25																	
26	Max	3,415	4,134	3,425	2,991	3,171	2,670	2,810	2,708	2,739	2,456	3,256		WPD unit costs			
27	Average ¹	1,942	2,034	2,350	2,036	2,130	2,128	2,107	1,992	1,916	2,022	2,227					
28	Median	1,743	1,615	2,123	1,939	1,889	2,118	2,074	1,935	1,802	2,053	2,136		2,248	2,092	1,966	
29	Min	0	0	0	0	0	0	0	0	0	0	0					
30														GB unit costs			
														1,991	2,048	2,093	

4.4.4 “Sense-check” comparison of RIIO-ED2 unit costs against RIIO-ED1 outturn costs

As part of its data validation of proposed RIIO-ED2 unit costs for asset replacement, WPD has also undertaken further analysis of its RIIO-ED2 costs relative to its own latest outturn costs for RIIO-ED1 – this is illustrated within Figure 8 below.

Figure 8: Example of WPD variance analysis of RIIO-ED2 unit costs relative to RIIO-ED1 (WPD out-turn)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Asset Class	Name		Forecast ED2 Asset Replacement Unit Cost (£k @12/13 prices)	WMID	EMID	SWALES	SWEST	ENWL	NPGN	NPGY	LPN	SPN	EPN	SPD	SPMW	SSEH	SSES
2	Overhead Pole Line	6.6/11kV OHL (Conventional Conductor)	HV	km	17,684.6	17,684.6	17,684.6	17,684.6	0	0	0	0	0	0	0	0	0	0
3	Overhead Pole Line	6.6/11kV OHL (BLX or similar Conductor)	HV	km	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Overhead Pole Line	20kV OHL (Conventional Conductor)	HV	km	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Overhead Pole Line	20kV OHL (BLX or similar Conductor)	HV	km	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Overhead Pole Line	6.6/11kV Pole	HV	Each	196,290	196,290	196,290	196,290	0	0	0	0	0	0	0	0	0	0
7	Overhead Pole Line	20kV Pole	HV	Each	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Cable	6.6/11kV UG Cable	HV	km	99,872.3	99,872.4	97,502.4	97,172.9	0	0	0	0	0	0	0	0	0	0
9	Cable	20kV UG Cable	HV	km	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Cable	6.6/11kV UG Cable	HV	km	4,85,051.4	4,85,051.4	4,85,051.4	4,85,051.4	0	0	0	0	0	0	0	0	0	0
11	Switchgear	6.6/11kV CB (RM)	HV	Each	9,376.96	9,376.96	9,376.96	9,376.96	0	0	0	0	0	0	0	0	0	0
12	Switchgear	6.6/11kV CB (GPR Primary)	HV	Each	29,263.95	29,263.95	29,263.95	29,263.95	6,945.6	6,945.6	6,945.6	6,945.6	12,510.20	12,510.20	12,510.20	9,666.26	9,666.26	9,666.26

In addition, WPD carried out a further sense-check of its proposed RIIO-ED2 unit costs compared to RIIO-ED1 upper quartile unit cost (i.e. other DNO RIIO-ED1 out-turn). This is illustrated in Figure 9 below.

Figure 9: Example of WPD ED2 Unit Cost Performance against ED1 (for other DNOs)⁴

	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
				ED2 Forecast				ED1 Out-turn									
				WMID	EMID	SWALES	SWEST	ENWL	NPGN	NPGY	LPN	SPN	EPN	SPD	SPMW	SSEH	SSES
		Relative Efficiency		99%	98%	96%	96%	102%	99%	102%	178%	144%	123%	111%	114%	106%	120%
				1	2	3	4	5	6	7	8	9	10	11	12	13	14
				ED2 Forecast Unit Cost (£k)				ED1 Out-turn Unit Cost (£k)									
				WMID	EMID	SWALES	SWEST	ENWL	NPGN	NPGY	LPN	SPN	EPN	SPD	SPMW	SSEH	SSES
				19,191.6	19,191.6	19,191.6	19,191.6										
				0.40772	0.40772	0.40772	0.40772										
				1.50387	1.50387	1.50387	1.50387										
				0	0	0	0										
				92.4021	90.4327	78.9571	83.7124										
				0	0	0	0										
				0	0	0	0										
				1.06651	1.06651	1.06651	1.06651										

WPD has a range of methods in operation that are used to inform their RIIO-ED2 unit cost data validation exercise, making good use of available data within their organisation and from other external sources.

The data sources give added assurance to GHD that the unit costs developed for RIIO-ED2 are subject to sufficiently robust internal checks and review prior to them being signed off.

⁴ Other DNO data has been redacted as WPD do not have permission to share data with GHD.

5. Sample assessment

To aid our assessment of the reasonableness of the process adopted for the development of unit costs for the RIIO-ED2 Business Plan, we have undertaken a targeted sample assessment of four assets. The four assets sampled are:

- LV Cable (Plastic)
- 6.6/11kV Poles
- 33kV CB Outdoor Air Insulated
- 132kV Transformers

Our targeted sample assessment focusses on reviewing the specific assumptions made by WPD in their calculation of the unit costs for each sample asset type proposed for the RIIO-ED2 Business Plan and confirming their suitability. We have also undertaken a high-level benchmarking exercise to assess whether the proposed WPD unit costs are within the bounds of GHD's expected unit cost range for equivalent assets.

5.1 Unit cost assumptions

Section 4.2 provides our commentary relating to WPD's overall approach in developing its unit costs. This involves a bottom-up approach, whereby each of the different input resources required to deliver and install an asset "unit" are separately identified and quantified. This provides full transparency on the input resources used, assumptions made and consequential impact on the unit cost for each asset type.

In our review and meetings with WPD, we carried out "deep-dive" discussions to better understand and challenge some of these input resources and assumptions used.

Our comments and observations for each asset type are presented in Table 2 to Table 5 below.

Table 2: Comments on WPD assumptions (LV Cable Plastic)

Observation	Comment
Unit cost based on use of 300mm ² Wavecon only – no other cable size used as an input resource	WPD has made a business decision to standardise LV cable size to 300mm ² only – this is driven by wider business strategy to improve WPD losses performance. GHD has not studied the cost-benefits of this strategy but agree this would be an appropriate driver for standardising cable size, using only the largest size cable.
Cable trench excavation – unit cost assumes 80% footpath excavation: 20% roadway excavation	GHD initial view was that the assumption of roadway excavation was overstated (which will result in an overly inflated unit cost due to higher roadway excavation and reinstatement charges). WPD provided evidence to support the proposed proportional split, citing numerous projects delivered where the footpath congestion from other utilities has forced WPD to install assets in the roadway.
Number of LV straight joints assumed in unit cost build up – WPD has assumed 15 straight joints per 1,000m	Given that cable drums have traditionally been supplied in drum lengths of more than 250m, GHD's initial view was that the number of straight joints was over-stated. However, the method of installing replacement LV cables in busy urban areas, with associated permitting and street work safety requirement, results in much shorter cable lengths being installed, justifying the higher number of straight joints included within the WPD cost build.
Unit Cost difference across WPD Licence areas	GHD observed differences in the stated unit cost for LV U/G cable across the four WPD licence areas. Further analysis of the input resources used in the compilation of the unit costs identified that the only difference in component costs related to excavation & reinstatement charges. As these vary across the different contracts within the different Licence areas, this results in a unit cost variation, which was fully explained and accepted.

Table 3: Comments on WPD assumptions (6.6/11kV Poles)

Observation	Comment
Unit cost build up is based on a weighted average of material / installation costs for different pole types / grades.	The assumed weightings for light pole, medium pole and heavy-duty pole (40%,45%,15% respectively) are based on historic pole usage and proportional split is deemed reasonable assumption.
Supply & Install Stay Wire – Assumed occurrence of 50%	Assumption that a stay wire is required on every alternate pole – this is reasonable given the assumption on the split of angle & terminal poles explained above. In some areas, stay wires will also be required on intermediate straight-line poles, particular in the remote exposed parts of the network.

Table 4: Comments on WPD assumptions (33kV CB Outdoor Air Insulated Switchgear)

Observation	Comment
Unit cost build-up based on assumed (80%/20%) split of 1250Amp / 2000Amp circuit breakers.	Given the standard configuration for a 33kV switchboard, with incoming transformer CBs, Bus-Section CB and the number of feeder CBs, this proportional split is deemed reasonable.
1250Amp CB cost based on Purchase Contract for Primary Bus Section (B/S) CB. 2000 Amp CB cost based on Purchase Contract for Bulk Supply point (BSP) Feeder CB	Agreed – these selections ensure provision for metering is included in the purchase price.

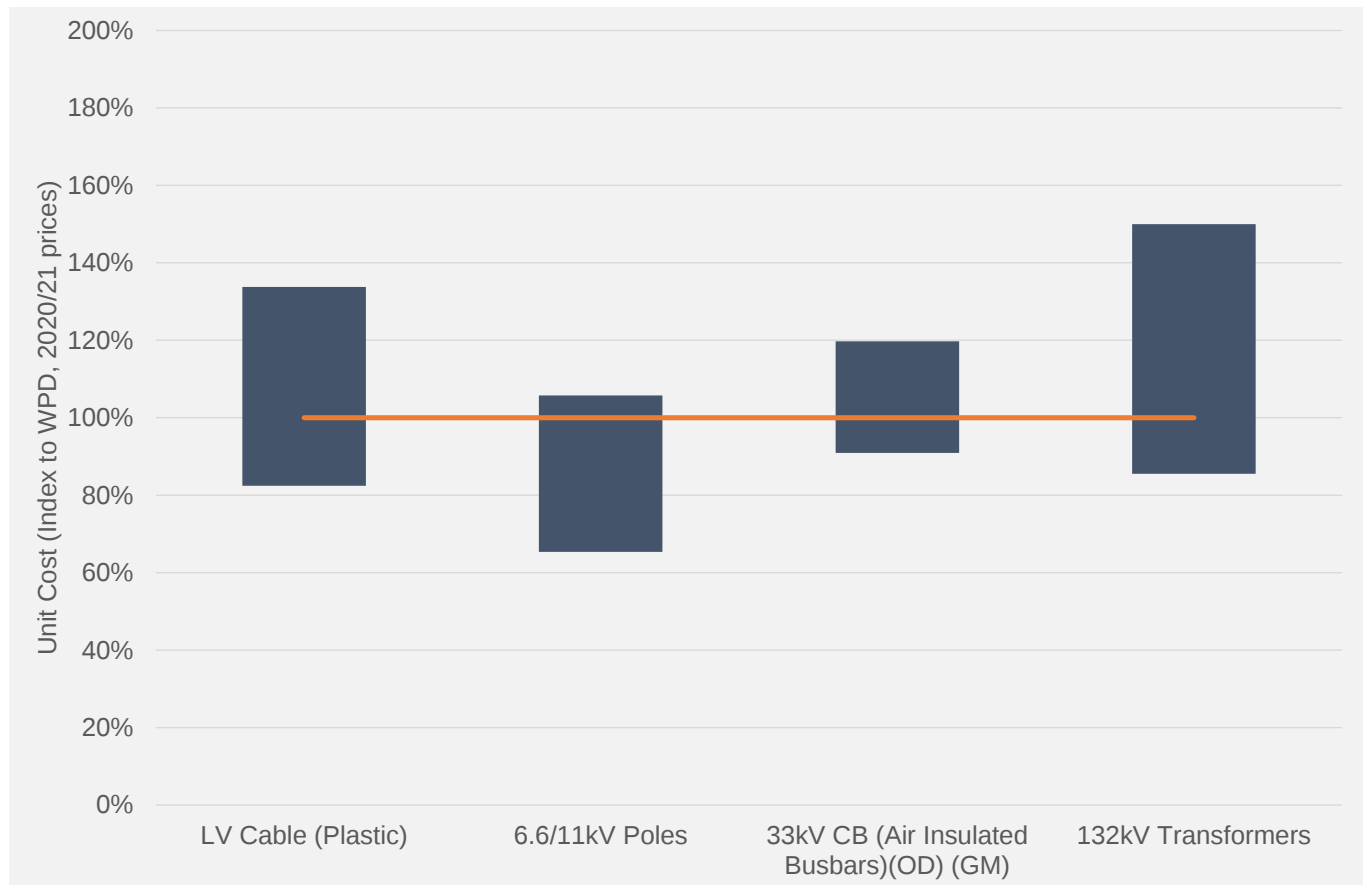
Table 5: Comments on WPD assumptions (132kV Transformers)

Observation	Comment
Unit Cost for 132kV transformer replacement is a weighted unit cost based on 5 different transformer specifications.	WPD has developed unit costs for five different types of transformer, giving due consideration to different transformer voltage ratios and different equipment ratings. The unit cost for each specification of transformers is calculated and WPD provided this information to GHD. The volume of each specification of transformer is quantified and a single weighted unit cost can then be calculated, based on unit cost x volume for each transformer specification. This approach results in a reasonable single value being calculated.
Provision of an 18% uplift in transformer purchase cost to account for change in specification.	WPD advised that new 132kV transformers to be purchased will be specified as “Tier-2” units, rather than current “Tier-1” units. The new specification is an Eco-friendly low loss unit. As no 132kV transformers have been purchased to the new Tier-2 specification. WPD has assumed an 18% uplift to the Tier-1 contracted prices. This uplift percentage is based on a comparison of Tier-1 v Tier-2 prices that WPD carried out for EHV transformers (33kV & 66kV primary voltage). The comparative analysis was shared with GHD, and we agree with the uplift percentage applied to 132kV transformers.

5.2 Benchmarking assessment

We have undertaken a high-level benchmarking exercise to assess whether the proposed WPD unit costs are within the bounds of GHD’s expected unit cost range for equivalent assets. The findings of this analysis are presented below in Figure 10. The orange line represents the WPD unit costs provided to GHD in October 2021, whilst the blue bars represent the range of unit costs for those assets from GHD’s unit cost database. All data has been unitised relative to the WPD unit cost.

Figure 10: WPD proposed unit costs versus database



Our analysis is not based on an extensive benchmarking, but the following should be noted when interpreting the chart above:

- For comparative purposes, the GHD unit cost database has been limited to cover datasets from the UK and Ireland only.
- Where necessary, unit costs have been converted to 2020/21 prices using a blended CPI/RPI UK price index and average annual foreign exchange rates witnessed between Euros and British Sterling. As such, real price changes may not be accounted for in the GHD ranged data.
- As expected with any benchmarking exercise, the GHD dataset includes a mix of historic and recent unit cost data. We have limited all historic data to within the RIIO-ED1 timeframe.
- The upper end of the 132kV transformer range is likely to be higher than expected due to limited volume data from some historical sources, meaning that a straight average unit cost was derived from these sources rather than a weighted average unit cost (as per WPD's proposed unit cost).

As can be seen from the chart above, the WPD unit costs for the sampled assets are within the range expected for all four asset types. The WPD unit costs sit towards the lower end of the range for LV Cable (Plastic), 33kV CB Air Insulated Busbars (OD) and 132kV Transformers, whilst its unit costs sit at the top end of the unit cost range for 6.6/11kV Poles.

Following discussion with WPD, we note the following:

- LV Cable (Plastic)
 - WPD has taken the decision for RIIO-ED2 to use 300mm² cable in all asset replacement activities. WPD has informed GHD that this decision is likely to have increased WPD's unit cost from historic levels and that this is likely to have pushed WPD's unit cost higher into the presented range than if current practice was maintained.
- 6.6/11kV Poles

- WPD's asset replacement policy for poles is such that they do not keep a decayed pole on the system for longer than 12 months, with reporting KPIs in place to ensure this target is met.
 - GHD was informed that the targeted removal of decaying poles is beneficial to improving storm resilience although other DNOs do not necessarily operate under the same practice, preferring to wait for achievable economies of scale. WPD indicate that this policy results in WPD's positioning at the higher end of the presented range (but still within it).
- 33kV Outdoor Circuit Breaker
 - There were no WPD comments relating to the unit cost comparison of this asset type.
 - 132kV Transformers
 - WPD unit cost is an average cost based on costs and volumes for five different specifications of 132kV transformer.
 - The broader range for this asset type reflects the price sensitivity to different asset specification and asset volumes.
 - WPD has assumed an average increase of 18% to some of the components of the 132kV transformer unit costs⁵ to account for the new Tier-2 specification.

GHD has reviewed specific assumptions relating to the composition of unit costs and assumptions for all components of the four assets sampled and is satisfied that the data reflects the process discussed with WPD and outlined in section 4 of this report.

In relation to the specific unit costs assessed, GHD is satisfied that, based on our own database, the unit costs appear within the bounds of reasonableness. The explanations provided by WPD and resulting unit costs for each asset are typical, accurate and efficient.

⁵ Uplift covers 132/33 60MVA Tx - Supply & Install, Connectors and Busbars, Multicores, Earthing, Commissioning, Manufacturers Type Tests and Storage Cost components only.

6. Concluding statement

We can confirm that the process and approach adopted by WPD in determining its unit costs data for asset replacement for input into its RIIO-ED2 Business plan is robust and reasonable. Specifically, we can confirm that:

- 1** WPD's approach to unit cost development is sufficiently robust to identify all input resources that need to be considered.
- 2** WPD has taken appropriate steps to optimise the quality of input resources required for each unit (e.g. grade of materials / labour).
- 3** WPD has deployed a suitable approach to quantifying the volume of input resources needed for each unit (e.g. number of input units required).
- 4** WPD has deployed a suitable approach to forecasting the price of the input units.
- 5** WPD operates to acquire input resources at best value.

Further, in relation to the specific unit costs of the four samples assets, ***GHD is satisfied that, based on its own database, the proposed unit costs appear within the bounds of reasonableness and align with the findings regarding the five statements above.*** As such, based on the audit procedures assessed and information provided by WPD, the unit costs for the sampled assets are considered typically representative, accurate and efficient.



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