Utility Regulator
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RP7 - NIE Networks Price Control 2025-2031

Final Determination Annex P
Assessment of Network Investment Direct Allowances
30 October 2024

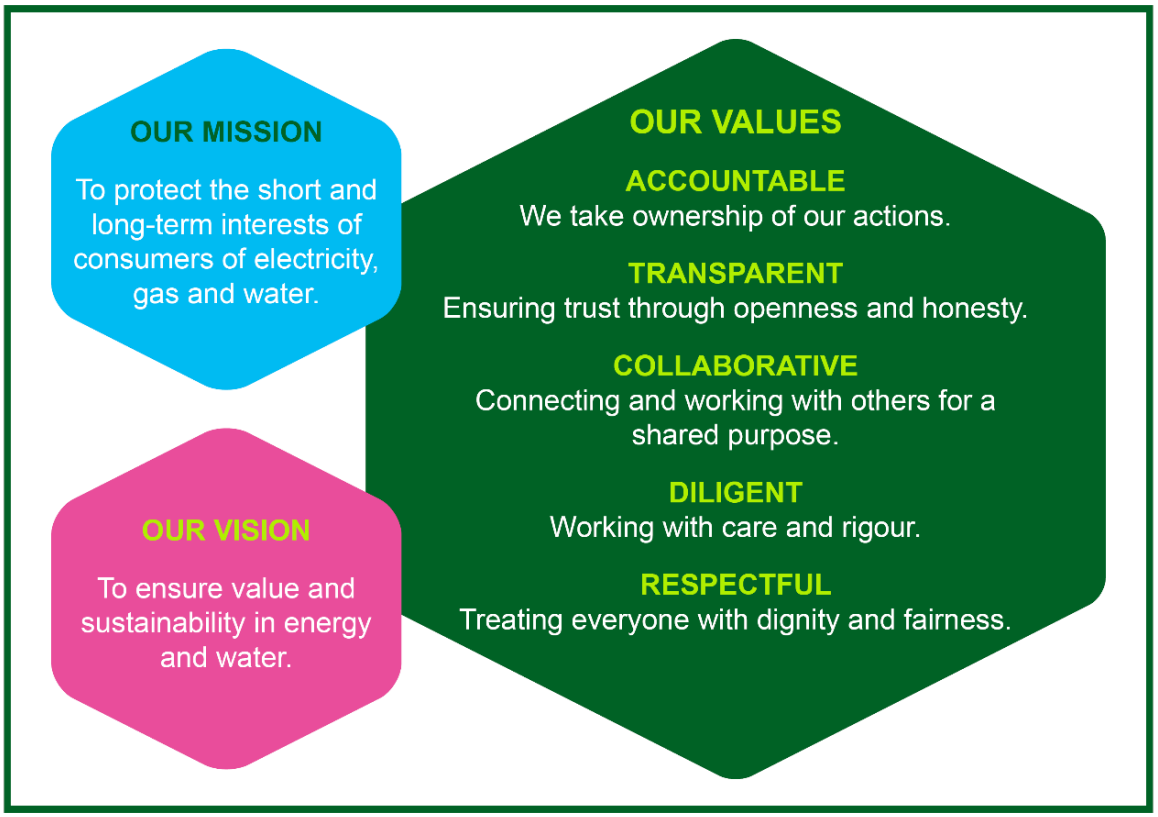
About the Utility Regulator

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

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

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

We are based at Queens House in the centre of Belfast. The Chief Executive and two Executive Directors lead teams in each of the main functional areas in the organisation: CEO Office; Price Controls; Networks and Energy Futures; and Markets and Consumer Protection. The staff team includes economists, engineers, accountants, utility specialists, legal advisors and administration professionals.



Abstract

This annex sets out the Utility Regulator's assessment of NIE Networks' proposals for direct network investment, which forms part of the overall capital investment proposed by the company for the RP7 price control period.

Audience

NIE Networks, consumers, consumer representatives, consumer groups, other regulated companies in the energy industry, government, and other bodies with an interest in the energy industry.

Consumer impact

The overall consumer impact of RP7 is set out in the main final determination report. The estimates of direct network investment direct expenditure in this annex contribute to the determination of tariffs for RP7.

Contents

1. Introduction

Key changes from the draft determination

1.1 In the draft determination, we proposed a reduction of £66.3m in funding compared to the proposals made by the company for direct network investment. In its response to the draft determination, the company accepted £10.4m of the reduction we proposed to direct capital allowances. However, the company asked that we reverse £55.9m of the reductions and set out its reasons why it thought this was the result of errors in our assessment. Our response to the issues raised by the company is given in detail in this annex and summarised in Annex Z (NIE Networks consultation responses). Our assessment of direct capital investment has been updated to take account of on-going engagement with NIE Networks and the feedback provided by it and other stakeholders in response to the draft determination.

1.2 The key changes from the draft to final determination, in respect of direct network investment, are:

a) Secondary network reinforcement - touch the network once (TTNO) costs allowed through volume driver (estimated £20.8m)

b) 11kV overhead lines - Additional £17m added to deliver the new specification

c) Non-recoverable alterations - Additional £5.3m added to deliver increased activity forecasted by NIE Networks

d) A deduction of £7.6m to reflect the inclusion of 2024 data into the analysis on:

(i) 33kV Re-engineering -£1.5m

(ii) Undereaves -£1.7m; and

(iii) LV overhead lines -£4.4m

1.3 We also undertook a review of the unit rates used in the draft determination to take account of the latest information on RP6 out-turn. We made adjustments to the final determination where this review revealed material changes in unit rates, although we did not increase unit cost rates unless, in its response to the draft determination, the company had identified an error.

1.4 The changes to individual allowances together with detailed explanations are in Chapters 2 and 3 of this document.

Overview

1.5 This annex sets out our assessment of NIE Networks' proposals for direct network investment which forms part of the overall capital investment proposed by the company for RP7.

1.6 Direct investments are those activities which involve physical contact with network system assets such as refurbishment or reinforcement of existing assets and the creation of new assets. Other strands of investment not covered in this annex include indirect expenditure and metering.

1.7 Direct network investment is treated in a number of ways in this price control:

a) investment for which an ex-ante allowance is included in this determination with defined outputs;

b) investment for which an ex-ante allowance is included in this determination with no defined outputs (lump sum);

c) investment for which a unit cost is determined but the outputs are uncertain (volume driven allowance)

d) investment carried out under an uncertainty mechanism' where an estimate is included for costs which will be determined at a later date when the need for the project has been confirmed and the scope, cost and programme developed.

1.8 NIE Networks proposed direct investment in the distribution and transmission networks in RP7 of £1,388.2m in 2021/22 prices prior to the application of real price effects and on-going efficiencies. This included an estimate of major transmission maintenance projects (£493.4m) which will be assessed under the D5 mechanism (see Annex S). A further £19m was included for innovation funding and this is dealt with separately in Annex N.

1.9 Taking account of this, we have identified £875.6m of planned direct network investment in the company's submission for which we provisionally determined an ex-ante allowance of £808m (before the application of frontier shift).

1.10 In its response to our draft determination, NIE Networks provided additional information and data which we used to revise our assessment of allowances.

1.11 Table 1.1 below shows the changes from submission to draft determination to final determination.

	Distribution (£k)	Transmission (£k)	Total (£k)
NIE Networks Business Plan Submission	800,657	587,437	1,388,093
Less innovation and D5 estimates	-19,080	-493,400	-512,480
Business plan core investment net of Innovation and D5 estimates	781,577	94,037	875,614
UR draft determination adjustments to core investment plan	-57,873	-8,386	-66,259
Draft determination of core investment plan	723,704	85,651	809,355
UR final determination adjustments to core investment plan	52,683	4,649	57,332
Final determination excluding innovation and D5 estimates	776,387	90,300	866,687
Add back innovation and D5 estimates	4,750	493,400	498,150
Final Determination	781,137	583,700	1,364,837

Table 1.1: Change in direct network investment from the business plan submission to draft determination to final determination

1.12 For the above core investment, we have carried out a detailed assessment and challenge of the company's proposals, considering both the need for the work proposed, the scope of work proposed and estimated cost of the work. We have been assisted in this assessment by our technical consultants Gutteridge Haskins & Davey (GHD) whose experience covers the assessment and delivery of similar works in Northern Ireland, in Great Britain (GB) and internationally.

1.13 We have concluded that an efficient cost of investment to maintain and develop the network as proposed by NIE Networks in its business plan is £1,373m before the application of real price effects and on-going efficiencies.

1.14 In this annex, all costs are reported in 2021/22 prices and before the application of real price effects and the application of on-going efficiencies

1.15 In addition to the work necessary to maintain and enhance the distribution and transmission networks, further work is expected to be identified in the future to improve the capacity or capability of the transmission network. This could be a material strand of investment but the scope, timing and costs of the work are highly uncertain. In RP6, efficient allowances for this type of work have been determined on a case by case basis as the work is confirmed, and we intend to continue this approach in RP7.

Identification of allowances

1.16 The various distribution and transmission programmes and allowances have been identified by a numbering system and are shown in Table 1.2 and Table 1.3 below.

Programme	Description	Detailed explanation in
D06	Distribution Tower Lines	Annex P
D07	33kV Overhead Lines	Annex P
D08	11kV Overhead Lines	Annex P
D09	LV Overhead Lines	Annex P
D10	Undereaves	Annex P
D11	Cutouts	Annex P
D13	Primary Plant	Annex R
D14	Primary Transformers	Annex R
D15	Secondary Substations	Annex R
D16	Distribution Cables	Annex P
D39	SCADA	Annex R
D41	Operational Telecoms Network	Annex R
D43	Distribution ESQCR	Annex P
D50	Substation Flooding	Annex P
D57	Distribution Network Reinforcement	Annex P
D101	Network Alterations	Annex P
D603	Distribution Protection	Annex R
D604	Connection Driven System Work	Annex P
D605	Network Access and Commissioning	Annex P
D606	Innovation (see Annex N)	Annex N
D701	Distribution Earthing	Annex P
D702	Network Performance	Annex P

Table 1.2: Distribution programmes

Programme	Description	Detailed explanation in
T10	110kV Switchgear Replacement	Annex R
T11	275kV Plant Ancillaries	Annex R
T12	110kV Plant Ancillaries	Annex R
T13	275/110kV Transformer Replacement	Annex R
T14	110/33kV Transformer Replacement	Annex R
T15	22kV Reactor Replacement	Annex R
T16	Transmission Transformer Refurbishment	Annex R
T17	275kV Overhead Line Asset Replacement	Annex R
T19	110kV Overhead Line Asset Replacement	Annex R
T20	Transmission Cables	Annex R
T602	Transmission Protection	Annex R
T603	Network Access and Commissioning	Annex P
T701	Strategic Spares	Annex R
T702	Transmission Earthing	Annex P

Table 1.3: Transmission programmes

2. Facilitating Net Zero Through a Flexible and Integrated Energy System

2.1 This chapter includes the following sub-programmes

Sub-programme	Submission Value (£k)	Draft Determination (£k)	Final Determination (£k)
D08f: 11kV Overhead Line Rebuild	208,940	191,914	208,940
D08g: Low Capacity Transformer Replacement	8,794	8,794	8,794
D57b: Primary Network Reinforcement. Forward Power Flow	29,978	26,980	29,661
D57c: Secondary Network Load Related Expenditure[1]	101,422	101,400	124,26876[2]
D57l: Primary Network Reinforcement. Reverse Power Flow	19,958	17,963	17,963
D57n: EHV and HV Monitoring	1,261	1,261	1,261
Total	370,353	348,312	290,886

Table 2.1: Facilitating net zero sub-programmes

D08: HV overhead lines

Scope of work

2.2 Historically, NIE Networks has carried two types of maintenance on the high voltage overhead line network, these were:

a) Refurbishment: The replacement of defective components carried out over a 45 year cycle

b) Re-engineer: Rebuild sections of mainline (replacement of conductors and defective supports) and refurbishment of associated spur lines.

2.3 The above sub-programmes maintain the condition of the system but do not materially increase the capacity or resilience.

2.4 A large part of the high voltage network (11kV & 6.6kV) contains low capacity conductors (25sqmm Aluminium Conductor Steel Reinforced [ACSR]). This conductor was first introduced in the 1960s during the rural

[1] This sub-programme is volume driven and the allowances are based on forecast volumes
[2] Includes "Touch The Network Once (TTNO)" investment which was not included in the draft determination

electrification programme and is now outdated due its low current carrying capacity.

2.5 The electrification of transport and domestic heating will expose the existing high voltage network to much higher loads than it was originally designed to withstand. In order to prevent the network from being a blocker to the uptake of LCTs, NIE Networks has introduced a new maintenance programme for the high voltage system. The new programme involves replacement of all low capacity conductors with a minimum specification of 50sqmm All Aluminium Alloy Conductor (AAAC). This will increase the capacity of the network and also provide an improved element of resilience due to the larger conductor's increased mechanical strength.

2.6 The installation of larger conductors will require higher volumes of supports to be replaced to cope with the higher mechanical loads and ground clearance issues.

2.7 A distribution transformer with a capacity below 10kVA will be unable to supply the load of an electric vehicle (EV) fast charger and ordinary domestic load. For RP7, NIE Networks is proposing to continue its programme of proactive replacement of low capacity transformers in preparation for the expected uptake in EV sales. To this end, all transformers below 10kVA will be replaced with 25kVA units.

NIE Networks' RP7 proposal

2.8 In its submission, NIE Networks has proposed to complete the removal of low capacity conductor within three price controls (15 years). This ambitious strategy will involve the rebuilding of 8,731km of high voltage overhead line during RP7.

2.9 The proposed programme of works replaces the previous two sub-programmes of re-engineer and refurbish, therefore categories D08a and D08b are now obsolete.

2.10 In addition to increasing capacity and improving resilience to severe weather, the rebuild programme will also address any vertical and horizontal clearance issues and ensure that the system is in compliance with Electricity Safety, Quality and Continuity Regulations (ESQCR)

2.11 The RP7 proposal calls for a step change in the rate of investment as shown in Table 2.2 below:

Period	Expenditure pa (£k)
RP6 (Outturn)	8,116
RP7 (proposed)	34,823

Table 2.2: RP6 and proposed RP7 HV OHL investment

Draft determination

D08f: 11kV rebuild

2.12 The new specification for HV OHL was introduced in the RP6 extension year and is proposed to continue through the RP7 Price Control with no technical changes. Due to the continuation of works, our initial thought was to continue through RP7 with unit rate we had previously determined for the RP6 extension (£18,477/km).

2.13 NIE Networks stated in its submission that it had recalculated its costs for RP7 based on:

a) Reallocation of ESQCR costs associated with HV overhead Lines (£333/km); and

b) an uplift due to renegotiation of contractor costs (£5,121).

2.14 We agreed with the reallocation of ESQCR costs, however, we did not agree with NIE Networks assessment of contractor costs.

2.15 During the RP6 extension year assessment, we based our determination on 44% of the unit rate being contractor driven and a cost increase of 45%. Our approach for RP7 is to reduce the uplift to 39% to take account of the positive ~4% frontier shift. This made our draft determination 18,477+333+3,171=£21,981

2.16 The new programme of works began in January 2023; therefore our outturn data was limited to 3 months and is not deemed to be representative. We proposed to review this sub-programme in the round prior to the final determination with the benefit of a full year of outturn data but will not place full reliance on the data.

D08g: Low capacity transformer replacement

2.17 In its business plan submission, NIE networks proposed the same unit rate as we determined for the RP6 extension year for pole mounted distribution transformer replacement, therefore we accepted the costs.

2.18 The proposed volumes were also in line with those agreed in the RP6 extension year (approximately 0.5 transformers/km).

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D08f - HV OHL Rebuild	NIE Networks' proposal	km	8,731	23.931	208,940
	Draft Determination	km	8,731	21.981	191,914
D08g: Low Capacity Transformer Replacement	NIE Networks' proposal	km	4,330	2.031	8,794
	Draft Determination	km	4,330	2.031	8,794
D08: 11kV Overhead Lines Total	NIE Networks' proposal				217,734
	Draft Determination				200,708

Table 2.3: D08 HV OHL lines draft determination

Final determination

D08f: 11kV rebuild final determination

2.19 In its business plan submission, NIE Networks provided us with an early view of RIGs[3] data for 2023/24 reporting year and this showed outturn costs for HV OHL Rebuild to be £26.8k/km. This is a significant reduction from the previous reporting year's outturn of £55.6k/km, however, we recognise that the 2022/23 data was based on a 3 month period with very little output and initial mobilisation of contractors to the new specification. Therefore we did not include the 2022/23 data in our analysis as this is clearly an outlier.

2.20 In the draft determination we made an adjustment to the unit cost to account for the fact that this sub-programme commenced after the RPE base year. We also took into account the positive RPE in place at the time of the draft determination publication. These factors led to a deduction £17m from the submitted amount.

2.21 We have reconsidered our treatment of this allowance. In light of the outturn data submitted in July 2024 we now accept NIE Networks' original submission of a unit cost of £23,931 and an allowance of £208.9m which represents an increase of £17m compared to the draft determination position.

D08g: Low capacity transformer replacement – final determination

2.22 NIE Networks did not challenge our draft determination and have presented no further information on this sub-programme, therefore our draft determination position is now our final determination.

[3] Annual submission information to comply with UR's Regulatory Instructions and Guidance

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D08f - HV OHL Rebuild	NIE Networks' proposal	km	8,731	23.9	208,940
	Draft Determination	km	8,731	22.0	191,914
	Final Determination	km	8,731	23.9	208,940
D08g: Low Capacity Transformer Replacement	NIE Networks' proposal	km	4,330	2.0	8,794
	Draft Determination	km	4,330	2.0	8,794
	Final Determination	km	4,330	2.0	8,794
D08: 11kV Overhead Lines Total	NIE Networks' proposal				217,734
	Draft Determination				200,709
	Final Determination				217,734

Table 2.4: D08: Final determination

D57: Load related expenditure

D57b: Primary network load related expenditure (forward power flow)

Scope of work

2.23 NIE Networks' primary distribution system operates at Extra High Voltage (EHV) of 33kV and is comprised mainly of overhead lines, some underground cables and 33/11kV substations.

2.24 The secondary network in Northern Ireland includes the High Voltage (HV) system predominantly running at 11kV[4] and the Low Voltage (LV) system running at 400/230V. It is the LV system where the final connection to domestic properties is made.

2.25 Historically the network, at all voltages, was designed and operated around a unidirectional flow of energy. However, with the influx of distributed generation, the network must be able to cope with bidirectional flow.

2.26 Due to the bidirectional flow of energy, the company can no longer rely on "dumb" equipment to protect the network and requires real time data to allow it to configure the system for most efficient operation.

[4] The network in some parts of Belfast and surrounding areas is operated at 6.6kV. The "HV" classification includes 11kV and 6.6kV

2.27 Load related expenditure is not an easy allowance to calculate with any degree of certainty, especially with the introduction of Low Carbon Technology (LCTs). Therefore, lump sum allowances are suitable for items where the quantum of expenditure is calculable, but the location or nature of the expenditure is changeable. Additional protection in the form of specific uncertainty mechanisms is also discussed in Annex S of the draft determination.

NIE Networks' RP7 proposal

2.28 NIE Networks' primary (33/11kV) substations are classified according to the established load indices banding applied across the United Kingdom (UK) as shown in Table 2.5 below:

Category	Definition	Loading
LI 1	Significant Spare Capacity	>=0% and <80%
LI 2	Adequate Spare Capacity	>=80% and <95%
LI 3	Highly Utilised	>=95% and <99%
LI 4	Fully Utilised, mitigation requires consideration	>=99% for <9 hours pa
LI 5	Fully Utilised, mitigation required	>=99% >=9 hours pa

Table 2.5: Load indices

2.29 Our goal is to keep the number of substations classified as "LI 5" below 2% of the primary substation population. NIE Networks achieve this through a range of interventions which include

a) Increasing transformer capacity

b) Increasing capacity of incoming feeders

c) Procuring flexibility services

d) Reconfiguration of the network

2.30 NIE Networks employed a number of consultants to undertake LCT uptake forecasts which informed its decision on the level of investment necessary to keep ahead of network loading.

2.31 The key pieces of forecasting works referenced were:

a) *Forecasting of Low Carbon Technology Deployment in Northern Ireland* by WSP;

b) *Northern Ireland Electricity Networks EV UP Modelling Project* by Field Dynamics; and

c) *EY Commentary on NIE LCT Forecasts* by Ernst & Young.

2.32 NIE Networks then calculated the load impact on its primary substation fleet. This involved using measured demand obtained through monitoring, load profiling and forecast demand from the works mentioned above.

2.33 In its submission (EJP[5] 1.101), NIE Networks claimed that it has adopted a prudent modelling approach to ensure "that there is low risk that our baseline expenditure will not be fully required within the RP7 period". Below is a list of the conditions specifically included/excluded in NIE Networks' forecasting works.

a) Made ambitious assumptions around flexibility first.

b) Excluded demand relating to rapid/ultra-rapid public charging hubs.

c) Did not explicitly consider large volume housing. .

d) Did not account for demand associated with HGV electric fleets.

e) Did not account for the commercial electrification of heat.

f) Did not account for the impact of Cold Load Pick Up (CLPU)[6].

g) Tested joint NIE Networks / SONI forecasts with stakeholders. In light of the recent CCC report[7] which implies that 350k EVs and electric vans and 160k heat pumps are required by 2030, NIE Networks states its 'best view' scenario forecasts (300k EVs and 120k heat pumps by 2030) would appear to be conservative.

2.34 The items excluded from the above have been deemed by NIE Networks as unlikely to affect primary network load growth during RP7 but if this is not the case and additional investment becomes a requirement, then the company has the opportunity to request additional funding during the reopener windows.

2.35 The outcome of the above works is a list of primary substation sites shown in Table 2.6 below together with the identified interventions and associated costs. In some cases the funded solution is a 'flexibility' solution whereby NIE Networks intends to purchase services which will reduce demand in certain circumstances and defer the need for investment. We welcome this development and the combination existing and new price control

[5] Engineering Justification Paper
[6] A phenomenon following a planned or unplanned network outage where there is increased and sustained demand, particularly prevalent with heat pumps and EVs.
[7] advice-report-the-path-to-a-net-zero-northern-ireland.

mechanisms incetivise the company to seek out further flexibility options and provides reasonable protection if it is unable to do so.

ID	Project	Intervention Summary	Conventional Cost (£k)	Flexibility Cost (£k)
1	Annsborough Central	Customer Flexibility		103
2	Ardboe Central	Customer Flexibility		13.3
3	Ballycastle Central	Rebuild network to 200sqmm	976	
4	Ballyfodfrin Central	Upgrade Dual Transformers	854	
5	Ballykelly Central	Customer Flexibility		1.7
6	Ballymena North	Customer Flexibility		11.2
7	Brookhill Central	Upgrade Dual Transformers	854	
8	Buckna Central	Upgrade Transformer	107	
9	Carrickmore North	Upgrade Transformer	472	
10	Carrickfergus West	Customer Flexibility		51
11	Castlederg South	Upgrade Dual Transformers	854	
12	Creagh Central	Upgrade Dual Transformers	854	
13	Fivemiletown Central	Network Flexibility		34
14	Garvagh North	Upgrade Dual Transformers	854	
15	Keady Central	Customer Flexibility		2.7
16	Laragh Central	Upgrade Dual Transformers	854	
17	Lisnaskea Central	Rebuild network to 200sqmm	115	
18	Monbrief	Rebuild network to 200sqmm	201	
19	Mullaghglass	New 33kV circuit from Lisburn Main and install 2nd 5/6.25MVA Transformer	3,804	
20	Newcastle North	Upgrade Dual Transformers	858	
21	Newry East	Customer Flexibility		58
22	Omagh West	Customer Flexibility		34
23	Portstewart South	Construct New Primary substation at Portrush South supplied from Loguestown Main	5,263	
24	Richhill Central	Customer Flexibility		8.4
25	Tullyvannon	Install second 10/12.5MVA 33/11kV Tx. And reconfigure 33kV network	1,063	
26	Ardboe/Cookstown Mesh	2 new 33kV circuits out of Dungannon Main to split network and transfer load	3,591	

27	Ballinamallard/ Ederny Mesh	Rebuild remaining 33kV network to 100mm	293	
28	Buckna/Carnlough Mesh	Rebuild network to 200sqmm	2,872	
29	Carrickmore/ Pomeroy/Crouk	Connect Pomeroy into Tremoge Cluster Substation	2,471	
30	Cullybackey/Kilrea Mesh	2 New 33kV Circuits from Rasharkin Cluster Main and transfer load	758	
31	Cloughy Central /Kircubbin East	Rebuild existing 33kV network to 100mm	1,091	
32	Derryleckagh/Kilkeel Mesh	New 33kV Circuit from Newry Main to D'leckagh to split network and transfer load	393	
Total Conventional Cost			29,454	
Total Flexibility Cost				317
Total Deferred Cost				
Going Further Faster			207,527	
Total Proposed			29,978	

Table 2.6: Primary network reinforcement: forward power flow proposal

Draft determination: forward power flow

2.36 We were in broad agreement with the need for forward power flow reinforcement. This is a continuation of the RP6 programme and, whilst the volume of work is increasing, the conventional interventions proposed are considered to be business-as-usual solutions.

2.37 Whilst NIE Networks identified a list of discrete sites, we do not propose to class these as nominated projects. This afforded the company as much flexibility as possible if reprioritisation of the works is required during RP7.

2.38 The works carried out during RP6 in this cost category are currently outturning at 10% below the expected yearly expenditure, therefore we applied this saving to the RP7 allowance.

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D57b Primary Network Reinforcement (forward power flow)	NIE Networks' proposal	LS	N/A	N/A	29,978
	Draft Determination	LS	N/A	N/A	26,980
	Total Change +/-				-2,998
	Total Change %				-10%

Table 2.7: D57b Primary network reinforcement (forward) draft determination

Final determination: Forward power flow

2.39 In order to provide better protection to the consumer we decided to change our approach to the funding of this sub-programme. In the draft determination we allowed an ex-ante, lump sum allowance. This type of allowance is not included in the deferral mechanism, therefore, any projects abandoned during the price control could be funded in the following price control. This undermines our no double funding policy.

2.40 NIE Networks has presented a defined list of projects for RP7, hence, it would be beneficial to fund these projects on a nominated basis. This provides a safety net that, in the event of a project being delayed it will either be deferred into the next price control with no additional funding allowed or, should the project be abandoned, it could be substituted for another at similar value.

2.41 As part of the defined listing of projects, NIE Networks identified £300k for the introduction of flexibility contracts. We are of the opinion that these costs should be classified as opex and we moved them from the capex allowance into the opex allowance.

2.42 The added complication of flexibility markets and their effect on funding should also be addressed. There are a number of scenarios to be considered:

a) Flexibility markets are identified after ex-ante funding has been determined for reinforcement works

(i) We are of the opinion that NIE Networks should be incentivised to actively seek out flexibility markets. To this end we intend to allow the underspent allowance to be shared through the D3 mechanism if new flexibility markets cause the deferral of capital expenditure. NIE Networks will have the ability to cover its additional opex costs (flexibility payments) from the return on capital it will earn from the deferral. We will allow the

deferred capex to remain on the RAB until the end of RP8, at which point we will carry out a RAB adjustment to remove the capex and review opex allowances to allow the company to continue to cover flex costs. Conversely, should the flexibility market subsequently fail, the company would be expected to invest in a capital solution, and any overspend would be shared through the D3 mechanism

b) Existing flexibility markets fail causing reinforcement works to be required

(i) Where existing flexibility markets fail and no capital allowances have been determined, we would expect NIE Networks to execute the necessary works and we would carry out an ex-post review to determine any additional funding required.

c) Additional substations (not previously nominated) require capital solutions

(i) We will retain the reopener windows stated in the draft determination (August 2027 & August 2029) and expect the company to provide a fully justified needs case for additional capex during the re-opener windows. Submissions outside of the windows will not be considered.

(ii) The company should consider, in the first instance, if substitution is a viable option to prevent additional expenditure

2.43 Any additional funding determined in the above processes can be can be implemented without a licence change via the additional allowed capex ACDR_Xt term of the existing licence

2.44 Given the revised model of funding for this sub-programme we will reverse the 10% reduction from our draft determination. We will, however, retain the allowance for Going Further Faster as this allows the company to continue to develop future flexibility markets. A detailed listing of allowances is shown in Annex Q. Table 2.8 below shows movement from draft to final determination:

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D57b Primary Network Reinforcement (forward power flow)	NIE Networks' proposal	LS	N/A	N/A	29,978
	Draft Determination	LS	N/A	N/A	26,980
	Final Determination	See Annex Q for detailed listing of projects			29,661

Table 2.8: D57b final determination

D57c: Secondary network reinforcement

Scope of works

2.45 In addition to the primary network reinforcement, NIE Networks has proposed significant load related investment in the secondary network.

2.46 NIE Networks has developed its plans for RP7 having considered a range of possible scenarios, it has based its central estimate of new demand on 300,000 electric vehicles (EVs) and 120,000 heat pumps (HPs) by 2030.

2.47 In RP6 we determined an ex-ante allowance for secondary network load related expenditure of £9.5m which was based on RP5 run rates and intended to allow the company to react to known operational constraints.

2.48 NIE Networks has made the case that this allowance must allow proactive solutions to potentially quickly changing network conditions which will be identified through the recently funded network monitors.

2.49 For the RP6 LCT Mid-term review, we determined a unit rate per identified EV charger. This was designed to enable NIE Networks to catch up with customers who had not informed the company of the connection of a fast charger and could potentially use the remaining headroom on the network without the knowledge of the company.

2.50 The allowance was designed as a short-term approach and not intended for use beyond RP6 when replacement of individual transformers could be integrated into the wider network refurbishmen programmes.

2.51 NIE Networks consultant, WSP, developed the LCT Planner tool on behalf of the Energy Network Association and in conjunction with GB Distribution Network Operators (DNOs). This is a modelling tool that can be used to forecast load growth on electricity networks. WSP was commissioned by NIE

Networks to make adjustments to the tool parameters in order to align with the network design in Northern Ireland.

2.52 In conjunction with the LCT Planner tool, NIE Networks utilised the "EV UP" modelling tool developed by Field Dynamics. This tool provides a locational element to the overall investment profile.

2.53 The above forecasting tools coupled with NIE Networks' Best View scenario for LCT uptake, produced gross investment forecast of £118.1m for secondary network reinforcement.

2.54 NIE Networks has stated that a number of savings can be applied to the gross cost and these are identified in Table 2.9 below.

2.55 Innovation savings represent non-conventional interventions such as the use of active network management which reconfigures the network automatically to redistribute load across a number of meshed substations.

2.56 Time of use tariffs is the estimated savings forecast by NIE Networks when EV owners charge their vehicles at night (economy 7 tariff) moving load away from the traditional peak time.

2.57 Optimisation of delivery represents the savings estimated through business as usual programmed works (e.g. 11kV OHL rebuild) which mitigates spend from the reinforcement budget .

	Gross Costs (Modelled)	Innovation Savings	Optimisation of Delivery	Proposed Cost
HV Circuits	36.583	1.957	0.031	33.640
HV/LV Substations	45.493	0	3.168	41.399
LV Circuits	36.056	0	0.104	26.383
Time of Use Tariffs		11.449	0	0
Total	118.132	13.406	3.303	101.422

Table 2.9: Secondary network reinforcement proposal

Draft determination

2.58 We were in broad agreement with the scope of secondary reinforcement, however we were uncomfortable allowing a lump sum allowance of this size due to the level of uncertainty driven by LCT uptake.

2.59 We considered the uncertainty mechanism proposed by NIE Networks and we cover this subject in Annex S of the draft determination. Instead of proceeding with a lump sum plus uncertainty mechanism, we intended to allow a volume driven allowance based on the interventions identified by NIE

Networks. This would provide the company with the flexibility it needs to execute the required works and the opportunity to out-perform through the D3 mechanism. Furthermore, customers would receive a level of protection due to the company being remunerated only for the volumes delivered.

2.60 A small ex-ante lump sum was allowed to enable NIE Networks to avail of flexibility services should the opportunity to procure them arise.

2.61 Our draft determination of secondary network reinforcement is summarised in Table 2.10 below.

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D57c: Secondary Network Reinforcement	NIE Networks' Proposal	LS	N/A	N/A	101,422
	Draft Determination	LS	N/A	N/A	1
D57o: Pole Mounted Transformers	NIE Networks' Proposal				
	Draft Determination	MVA	318*	85.7	27,253
D57p: Ground mounted transformers	NIE Networks' Proposal				
	Draft Determination	MVA	179*	80.2	14,356
D57q: HV UG reinforcement	NIE Networks' Proposal				
	Draft Determination	km	88*	95.9	8,439
D57r: HV OH reinforcement	NIE Networks' Proposal				
	Draft Determination	km	437*	57	24,909
D57s: LV UG Reinforcement	NIE Networks' Proposal				
	Draft Determination	km	260*	101.7	26,442
Total	NIE Networks' Proposal				101,422
	Draft Determination				101,400
	Total Change +/-				-22.386
	Total Change %				-0%
* Estimated volumes					

Table 2.10: Secondary network reinforcement draft determination

Final determination

2.62 After further engagement with NIE Networks we decided to revise our approach to this allowance. We will retain the volume driven approach, but we have significantly revised the tasks included in the approach and the associated unit rates.

2.63 Secondary network reinforcement is split into two categories of expenditure:

(i) Load: the direct cost of installing higher capacity assets to deal with load growth

(ii) TTNO: The additional cost of investment ahead of need during planned maintenance where there is evidence to support the requirement.

2.64 Examples of the above are:

(i) Load: Upgrade of HV overhead conductors to a minimum of 50sqmm outside of the planned maintenance cycle due to accelerated load growth

(ii) TTNO: Upgrade of HV overhead conductors above the standard capacity (e.g. 100sqmm) during planned maintenance because load growth data indicates 50sqmm will approach overload within the refurbishment cycle timeframe.

2.65 The purpose of TTNO is to prevent the additional cost of revisits to sections of the network in advance of the planned refurb/maintenance cycles.

D57: Secondary reinforcement load related unit rates

2.66 NIE Networks proposed the following unit rates for secondary network reinforcement:

Task	Unit Rate (£)	UoM
D57c1 - Ground Mounted Transformer	69,686	Site
D57c2 - Pole Mounted Transformer	90,298	MVA
D57c3 - LV Cable	131,896	Km
D57c4 - LV Overhead Line	40,423	Km
D57c5 - LV Cabinet	16,265	Ea
D57c6 - HV Cable	91,000	Km
D57c7 - HV Overhead Line	44,716	Km
D57c8 - HV Circuit Breaker (in contract)	25,024	Ea
D57c9 - HV Circuit Breaker (out of contract)	68,136	Ea
D57c10 - HV CB (switch house extension)	77,406	Ea
D57c11 - HV CB (new switch house)	210,836	Ea

Table 2.11: Proposed secondary network reinforcement load unit rates

2.67 We deal with each rate in turn below.

D57c1 - Ground mounted transformers

2.68 NIE Networks calculated the costs using the following base rates:

D15 Asset Unit Rates (RP7 Submission)	
D15b - Replace complete S/S	£62,925
D15c - Replace complete S/S and temporary S/S works	£71,294
D15Tt - Replace mini kiosk S/S	£63,689
D15z - Replace mini kiosk S/S and temporary S/S works	£72,160

Table 2.12: Proposed transformer replacement unit rates

2.69 Blended rates were derived by using a split between those sites which required temporary substations and those that did not. An additional criterion of the volume of mini kiosk substation replacements was used. This resulted in a blended rate of £64,047.

2.70 NIE Networks calculated that the additional transformer costs for those larger than the range shown in Table 2.12 above is £7,250 and that 50% of substation replacements would require this addition leading to £3,625 being added to the unit cost.

2.71 NIE Networks estimate that a further cost for lease, land agent and legal costs is £6,195. The company assumed 32.5% of new substations will require new leases and this results in £2,013 being added to the unit cost giving a total of £69,685.

2.72 We found the logic behind NIE Networks' calculations to be sound, but we disagreed with the rates which form the basis of the calculations. Our consultant GHD carried out analysis of the D15 rates and, when we use these figures instead of those proposed by NIE Networks, the base cost reduces to £56,875.

2.73 Adding on the percentage of sites requiring transformers above the normal range (50%) gives £3,625.

2.74 Finally, adding on the number of sites requiring new leases (32.5%) gives £2,013.

2.75 Our final determination of the total unit cost rate is £62,513 per site.

D57c2 - Pole mounted transformers

2.76 NIE Networks' LCT Planner Tool has indicated an additional 320MVA of capacity will be required on the pole mounted transformer fleet during RP7. This involves the following upgrades:

Existing Capacity (kVA)	New Capacity (kVA)
16	25
16	50
25	50
50	100
100	200

Table 2.13: Proposed transformer upgrade bands

2.77 We queried the individual unit costs used in the calculation as our RIGs data only provides average unit costs for PM Transformers and does not take capacity into account. In its response to our query, NIE Networks stated, "The out-turn transformer material costs have been influenced by procurement challenges with the programme, resulting in a transformer material out-turn rate that exceeds the new TX procurement framework contract rates".

2.78 For 16 – 25kVA, 16 – 50 kVA and 25 – 50 kVA replacements, the company proceeded to strip out the original material costs from the unit rate to give a base labour rate of £1,744. The new transformer costs were then added to form the proposed unit rate.

2.79 For 50 – 100 kVA replacements, an additional cost was added to cover the cost of replacing the pole to stout grade and fitting a set of HV fuses.

2.80 Transformer costs were quoted as:

Capacity (kVA)	Material Cost (£)	Labour Cost (£)	Unit Rate (£)
25	1,662	1,744	3,406
50	2,423	1,744	4,167
100	4,936	3,733[8]	8,669
200			21,802[9]

Table 2.14: Breakdown of transformer costs

2.81 Further output from the LCT Planner Tool indicates the volume of replacements and NIE Networks has calculated the costs for each capacity band as shown below:

Existing Arrangement	Proposed Arrangement	Tx Gross Capacity	Volume of Upgrades	Total Gross Capacity (kVA)	Unit Rate (£)	Total
16kVA	25kVA	25	1,298	32,450	3,406	4,421,320
16kVA	50kVA	50	1,823	91,150	4,167	7,596,386
25kVA	50kVA	50	2,802	140,100	4,167	11,675,850
50kVA	100kVA	100	419	41,900	8,668	3,631,923
100kVA	200kVA	200	72	14,400	21,802	1,569,744
			6,414	320,000		28,895,224
£28,895,224 ÷ 320MVA = £90,298/MVA						

Table 2.15: Estimated proposed cost for RP7

2.82 We are content with the logic behind NIE Networks' calculations with the exception of 25kVA transformers. In its business plan submission, the company proposed a rate of £2,031 for replacement of low capacity transformers. In order to be consistent, we applied this rate to secondary network reinforcement. This results in the changes shown below.

[8] Includes cost of pole and HV fuses
[9] D15f rate

Existing Arrangement	Proposed Arrangement	Tx Gross Capacity	Volume of Upgrades	Total Gross Capacity (kVA)	Unit Rate (£)	Total
16kVA	25kVA	25	1,298	32,450	2,031	2,636,238
16kVA	50kVA	50	1,823	91,150	4,167	7,596,386
25kVA	50kVA	50	2,802	140,100	4,167	11,675,850
50kVA	100kVA	100	419	41,900	8,668	3,631,923
100kVA	200kVA	200	72	14,400	21,802	1,569,744
	91,000		6,414	320,000		27,110,668
£27,110,668 ÷ 320MVA = £84,721/MVA						

Table 2.16: Final determination for PM transformer replacements

2.83 Our final determination of the total unit cost rate is £84,721 per MVA.

D57c3 - LV cable

2.84 This rate covers the laying of new cable or overlaying of existing cable ahead of the planned maintenance cycle due to accelerated load growth.

2.85 NIE Networks proposed a rate of £131,896 for secondary network reinforcement. This rate is less than the main business plan submission (D16j), which was £155,028 but does not include the additional service jointing work associated with D16j. We analyzed D16j and reduced the unit rate by 10%, to £139,489. We have also reduced the secondary network reinforcement rate by 10% to £118,706.

2.86 Our final determination of the total unit cost rate is £118,706 per km.

D57c4 - LV overhead lines

2.87 This rate covers the building of new LV overhead lines where required.

2.88 NIE Networks has proposed a rate of £40,423/km.

2.89 We used cost and volumes RIGs data to verify NIE Networks' proposal. Average LV pole cost is £1,301 and, on average there are 20 poles/km = £26,023

2.90 Average cost to install conductors is £11,782/km

2.91 This equates to £37,806/km which is £2,617 less than the company's proposal. We are reluctant to reduce the unit rate solely based on cost and volumes RIGs data as this does not take into account reinstatement costs where excavations are undertaken in footpaths. Furthermore, the RIGs data does not include costs for services fed from the new line. Taking these

issues into account we are content that the company's proposal does not appear unreasonable.

2.92 Our final determination of the total unit cost rate is £40,423 per km.

D57c5 - LV cabinet

2.93 This rate covers the cost of installing a larger LV cabinet at substation sites where the splitting of circuits or addition of new circuits cannot be supported by the number of feeder ways in the existing cabinet. The rate also covers the cost of jointing/terminating cables.

2.94 NIE Networks proposed a rate of £16,265 which is the same rate as proposed for D15y category in the main business plan. Our technical consultants, GHD, analyzed the D15 programme of works and agreed with the rate proposed, therefore we are content to proceed as proposed.

2.95 Our final determination of the total unit cost rate is £16,265 each.

D57c6 - HV cable

2.96 This rate covers the laying of new cable or overlaying of existing cable in excess of the business as usual volumes proposed in the business plan.

2.97 NIE Networks proposed a rate of £91,000 for secondary network reinforcement, the same as its main business plan submission (D16i). We assessed the D16 programme and determined a rate for D16i of £87,411. Keeping a consistent approach, we will apply the D16i rate to secondary network reinforcement.

2.98 Our final determination of the total unit cost rate is £87,411 per km.

D57c7 - HV overhead line

2.99 This rate covers the building of new high voltage overhead lines where required.

2.100 NIE Networks has proposed a rate of £44,716/km.

2.101 We used cost and volumes RIGs data to verify NIE Networks' proposal. Average HV pole cost is £1,712 and, on average there are 12 poles/km = £20,550

2.102 Average cost to install conductors is £20,820/km

2.103 This equates to £41,369/km which is £3,347 below than the company's proposal. As with LV overhead lines, we are reluctant to reduce the unit rate solely based on cost and volumes RIGs data as this does not take into account other costs such as switchgear. Furthermore, we assessed

conductor costs on a single phase basis – if we assume 3 phase conductors then the cost is £7,063 above the proposed rate. Taking these issues into account we are content that the company's proposal does not appear unreasonable.

2.104 Our final determination of the total unit cost rate is £44,716 per km.

D57c8 - HV circuit breaker (in contract)

2.105 There are many different types and manufacturers of circuit breaker currently installed on the system. This unit rate is to cover the cost of extending switchboards where there is currently a procurement contract in place for the circuit breaker make and model required.

2.106 The company proposed a rate of £25,024/CB. Our technical consultants, GHD, assessed the costs of the D13 category and, D13k category (Replace primary switchgear (11kV and 6.6kV) retro-fit) recommended a rate of £23,220. In keeping with a consistent approach across the price control we will apply our determined D13k unit rate to secondary network reinforcement.

2.107 Our final determination of the total unit cost rate is £23,220 each.

D57c9 - HV circuit breaker (out of contract)

2.108 This rate is to cover the costs of extending switchboards where there is currently no procurement contract in place for the make and model of circuit breaker required. With no framework costs agreed and a possible single action tender required, it is expected that the costs will be significantly higher.

2.109 The company provided data from previous procurement exercises and calculated a blended rate based on the expected cost of the circuit breaker panel and the probability of requirement (based on current volumes in service). We agreed with the logic of the calculations as it scaled back expenditure on the most expensive switchgear types based on the volumes in service.

2.110 Our final determination of the total unit cost rate is £68,138 each.

D57c10 - HV circuit breaker (switch house extension)

2.111 This rate is to cover the costs of extending existing switchgear enclosures.

2.112 The company provided a detailed breakdown of costs derived from previously completed works and framework contract rates. We are broadly content that the evidence provided is a fair representation of expected costs. However, we note that the proposed cost covers building works/services only

and does not include the additional switchgear. This will be an additional cost derived from either in-contract or out-of-contract switchgear procurement.

2.113 Our final determination of the total unit cost rate is £77,406 each.

D57c11 - HV circuit breaker (new switch house)

2.114 This rate is to cover the construction of a new switchgear enclosure where one does not exist.

2.115 The company provided a detailed breakdown of costs derived from previously completed works and framework contract rates. We are broadly content that the evidence provided is a fair representation of expected costs.

2.116 Our final determination of the total unit cost rate is £210,836 each.

2.117 Table 2.17 below shows a summary of NIE Networks proposed rates, estimated RP7 volumes and our adjustments:

Task	NIE Proposed Rate (£k)	UoM	Forecast Volumes	Estimated Cost (for Tariff Modelling)		UR FD Rate (£k)	Estimated Cost (for Tariff Modelling)	Var (%)
D57c1: Ground Mounted Transformer	70	Site	222	15,470		62.4	13,8638	-10%
D57c2: Pole Mounted Transformer	90	MVA	320	28,895		84.7	27,110	-6%
D57c3: LV Cable	132	km	260	34,293		118.7	30,864	-10%
D57c4: LV Overhead Line	40	km	0	0		40.4	0	0%
D57c5: LV Cabinet	17	ea	201	3,342		16.3	3,269	0%
D57c6: HV Cable	91	km	88	8,008		87.4	7,721	-4%
D57c7: HV Overhead Line	45	km	437	19,541		44.7	19,533	0%
D57c8: HV Circuit Breaker (In contract)	25	ea	36	901		25.0	901	0%
D57c9: HV Circuit Breaker (out of contract)	68	ea		0		68.1	0	0%
D57c10: HV Circuit Breaker (switch house extension)	77	ea		0		77.4	0	0%
D57c11: HV Circuit Breaker (build new switch house)	211	ea		0		211	0	0%
				110,450			103,261	-7%

Note 1. Figures may not sum due to rounding.

Table 2.17: Secondary network reinforcement load rates, final determination

TTNO

2.118 NIE Networks proposed the following TTNO rates for secondary network reinforcement:

Task	Unit Rate (£)	UoM
Ground Mounted Transformer	7,250	Site
Pole Mounted Transformer	52,594	Site
LV Cable	43,638	Km
LV Overhead Line	10,860	Km
HV Cable	47,678	Km
HV overhead Line	7,271	km

Table 2.18: TTNO proposed unit rates

Ground mounted transformers

2.119 This rate is intended to supplement the load rate and will be used when the capacity of a replacement transformer is required to be higher than the minimum specification of 500kVA.

2.120 The company assessed 444 sites and concluded that 202 transformers will require capacity increases in excess of minimum specification. The proposed allowance is the cost difference between a 500kVA unit with an associated 6-way distribution board and a 800kVA unit with an associated 8-way distribution board.

2.121 We are broadly content with the information provided and the proposed unit cost.

2.122 Our final determination of the total unit cost rate is £7,250 per site.

Pole mounted transformers

2.123 For TTNO, NIE Networks expects to convert pole mounted transformer positions into ground mounted. This appears to be logical as the capacity of pole mounted units is limited to 200kVA.

2.124 The company used the differential between:

(i) D15f (replace H pole substation) and the load rate for GM transformer replacement

(ii) D15g (H pole Transformer change only) and the load rate for GM transformer replacement

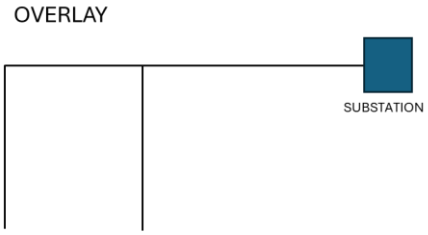
2.125 The above figures were then apportioned across the forecast volumes to form a blended rate of £52,594/site.

2.126 We are content with the methodology to calculate the blended rate but disagree with the base numbers used. Our technical consultant, GHD, assessed the D15 category and we used its recommended rates instead of NIE Networks' proposed rates. This results in a rate of £46,889 which represents a reduction of 11%.

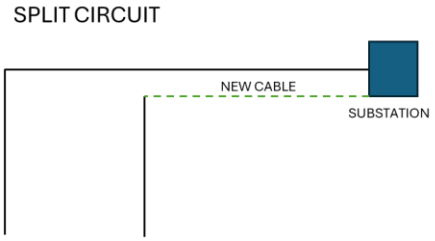
2.127 Our final determination of the total unit cost rate is £46,889 each.

HV and LV cable

2.128 When underground cables are replaced, it is generally not economically feasible to remove the old cable. These assets are disconnected and left in-situ. A new cable, generally following the same route, is installed and this is described as an "overlay" cable. During overlay operations it can be beneficial to split the circuit, this provides additional capacity (see sketches below):



2.129 New cable is installed to replace existing. This assumes that forecast load growth can be accommodated by the new cable capacity.



2.130 The circuit is split in to two sections and a new cable is installed from the substation to feed the separated part. This provides greater headroom for future load growth without having to re-open excavations.

2.131 The additional cable is laid in the same trench as the overlay cable, however, the cables must be spaced according to specification to allow correct heat dissipation. This means the overlay trench must be widened which increases excavation and reinstatement costs (TTNO costs).

2.132 The company provided the following breakdown of costs:

	LV Cable (£/km)	HV Cable (£/km)
Labour	1,841	1,622
Materials	27,709	19,409
Excavation and Reinstatement	14,087	26,647
Total	43,638	47,678

Table 2.19: TTNO proposed cable rates

2.133 In addition to the above information, the company also provided a detailed breakdown of excavation and reinstatement costs based on current framework contract rates.

2.134 We are in broad agreement with the company's proposal.

2.135 LV Cable - Our final determination of the total unit cost rate is £43,638 per km.

2.136 HV Cable - Our final determination of the total unit cost rate is £47,678 per km.

LV overhead lines

2.137 For standard refurbishment, open bare conductors are replaced with 95sqmm Aerial Bundled Conductor (ABC)

Open bare conductors

Aerial Bundled Conductor (ABC)

2.138 Open bare conductors are susceptible to clashing during high winds or short circuiting caused by falling tree limbs; both resulting in losses of supply due to fuse operation.

2.139 The benefit of installing ABC is that it is a fully insulated system and therefore much more resilient to external influences.

2.140 Replacing open conductors with 95sqmm ABC is basically a like-for-like operation. Existing poles and stays can be reused, providing they are not decayed. However, when installing 120sqmm ABC per the “touch the network once” policy, additional works are required to ensure the network is capable of withstanding the additional mechanical forces. These works involve replacing certain pole positions with upgraded, stronger poles. For instance, terminal pole positions currently served by medium grade poles with single stay wires would need to be replaced with a stout grade pole and utilize a double stay arrangement.

2.141 NIE Networks has carried out a number of separate projects where the touch the network once policy has been trialled:

- The total cost for 77km of work was £3,095,565
- Standard refurb rate (confirmed in RIGs) £29,563/km x 77km = £2,263,935
- TTNO cost = £3,095,565 - £2,263,935 = £831,631
- TTNO/km = £831,631 ÷ 77km = £10,860

2.142 NIE Networks supplied actual costs of one of the completed projects. The project was a section of LV overhead line, 0.36km in length. The additional costs involved in upgrading to 120mm2 ABC were:

Item	Detail	Project Cost (£)	Km Cost (£)
Conductor	120sqmm ABC vs 95sqmm ABC	280.0	767.0
Materials	Cost of 2 x 10m stout poles	596.6	
	Cost of 2 x additional stay assemblies	70.4	
Labour	Lower conductors Excavate hole Remove old pole Install new pole Excavate stay block hole Install additional stay assembly Backfill and reinstate both holes	3,389.0	9,286.0
		4,336.0	11,880.0

Table 2.20: Outturn costs for 0.36km of 120sqmm ABC

2.143 Based on the above information, we are content that the proposed extra over rate of £10,860 does not appear to be unreasonable.

2.144 Our final determination of the total unit cost rate is £10,860 per km.

HV overhead lines

2.145 Although the variation in costs for HV overhead lines is not as pronounced as LV, we still thought the difference was excessive. As with LV, the largest variations were not in the cost of conductors but in the cost of upgraded poles and additional stay arrangements to cope with the increased mechanical forces being exerted on the line. This issue is greatest where a line is being upgraded from 2 x 50sqmm to 3 x 100sqmm

2.146 NIE Networks created a blended rate to cover the main eventualities expected to be encountered on the 11kV system, these are:

a) Upgrading single phase ACSR[10] lines to 3 phase AAAC[11] during rebuild

b) Upgrading single phase Cu[12] lines to 3 phase Cu during rebuild

c) Increasing conductor size above 3 x 50sqmm during rebuild

d) Increasing conductor size above 2 x 50sqmm during rebuild

2.147 The variation in costs for these scenarios is shown in Table 2.21 below:

[10] ACSR – Aluminium Conductor Steel Reinforced (existing conductors)
[11] AAAC - All Aluminium Alloy Conductors (new conductors with greater current carrying capacity)
[12] Cu – Copper conductors

Work Type	100mm AAAC construction which overlaps with 3x50mm Rebuild	100mm AAAC construction which overlaps with 2x50mm Rebuild	3x50mm AAAC construction which overlaps with 2x50mm Rebuild	3x32mm Cu constructio n which overlaps with 2x32mm Rebuild	Totals
km of TTNO uplift	38.24	28.35	230.24	17.11	314
% of total TTNO	12%	9%	73%	5%	
Work type rate (21/22pb)	£11,165.21	£17,709.89	£5,472.78	£5,472.78	
Total Cost	£426,957	£502,075	£1,260,052	£93,639	£2,282,725

Table 2.21: HV OHL conductor replacement scenarios

2.148 NIE Networks used data from the LCT Planner Tool to inform the volumes of each of the scenarios listed above and also calculated the additional costs.

2.149 The conclusion of the analysis is that, in total, 314km of overhead line will require one of the four scenarios listed above at a total cost of £2.283m, and this equates to an average unit cost of £7,271.

2.150 Taken in the round, the proposed rate of £7,271 does not appear to be unreasonable.

2.151 Our final determination of the total unit cost rate is £7,271 per km.

2.152 Table 2.22 below shows NIE Networks' proposed rates and estimated RP7 volumes together with our adjustments:

Task	NIE Proposed Rate (£k)	UoM	Forecast Volumes	Estimated Cost (for Tariff Modelling)		UR FD	Estimated Cost (for Tariff Modelling)	Var (%)
D57c12: Ground Mounted Transformer	7	Site	202	1,465		7.3	1,465	0%
D57c13: Pole Mounted Transformer	53	ea	46	2,419		50.6	2,3267	-11%
D57c14: LV Cable	44	km	22.4	977		43.6	977	0%
D57c15: LV Overhead Line	11	km	607.5	6,597		10.9	6,597	0%
D57c16: HV Cable	48	km	9	429		47.7	429	0%
D57c17: HV Overhead Line	7	km	1,267	9,212		7.3	9,212	0%
				21,100			21007	-1%

Table 2.22: Secondary reinforcement TTNO final determination

D57l: Primary network reinforcement (reverse power flow)

Scope of work

2.153 As well as the reinforcement for conventional forward power flow, a separate allowance is proposed for reinforcement associated with reverse power flow. This is required to prevent congestion on the primary network which might prevent flow of excess generation back to the transmission system.

2.154 In RP6 we determined an amount of £10m for 33kV congestion. This allowance was for the purposes of rectifying legacy network design issues which were preventing distributed generation from connecting. These issues are now resolved.

2.155 NIE Networks has identified sections of the primary network where there is less than 250kW of generation capacity available. With RES-E targets for 2030 currently at 80%, and the promotion of PV[13] in new housing, it would not be acceptable to have sections of the network unable to accommodate reverse power flow caused by distributed generation.

[13] Photovoltaic (solar) panels

2.156 In EJP 1.102 the company identified 40 sites requiring one or more of the following interventions

Intervention	Volume	Cost (£m)
Tap Changer Replacement	42	3.36
Relay Replacement	34	0.58
Primary Transformer Replacement	4	1.71
33kV Circuit Breaker Replacement	1	0.16
33kV Network Restring (km)	171	9.82
33kV Network New Build (km)	35	4.33
Total		19.96

Table 2.23: Primary network reinforcement: reverse power flow proposal

Draft determination

2.157 We were in broad agreement with the need for reverse power flow reinforcement.

2.158 As with forward power flow reinforcement, NIE Networks identified a list of discrete sites requiring intervention, however, we do not propose to class these as nominated projects. This afforded the company as much flexibility as possible if reprioritisation of the works is required during RP7.

2.159 Similar to forward power flow reinforcement we are applying a 10% saving to the RP7 proposed allowance.

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D57l Primary Network Reinforcement (reverse power flow)	NIE Networks' Proposal	LS	N/A	N/A	19,958
	Draft Determination	LS	N/A	N/A	17,963
	Total Change +/-				-1,996
	Total Change %				-10%

Table 2.24: Primary network reinforcement (reverse) draft determination

Final determination

2.160 In its response to our draft determination, the company disagreed with our deduction of 10% from the proposed allowance.

2.161 We reviewed the latest RIGs submission including data up to March 2024 and saw a marked increase in expenditure on the D601 category which is

similar in nature to this sub-programme. Expenditure has increased from £4.5m in 2022/23 to £7.1m in 2023/24. However, to fully expend the RP6 allowance, the company would need to increase annual expenditure by a factor of 3.5.

2.162 Based on the above information and the fact that the company has provided no further evidence in its response to our draft determination, we will retain our draft determination position.

D57n: Network monitoring

2.163 The final strand of proposed expenditure in the D57 category is the expansion of network monitoring.

2.164 During RP6 we determined 3 separate allowances associated with network monitoring:

(i) D603c: Disturbance recorders (substation monitors)

(ii) D603d: Reverse power flow recorders

(iii) D58a: Data provision (network monitors)

2.165 The above classifications will cease at the end of RP6 and will be replaced with D57n as shown in Table 2.25 below.

	Volume	Unit Cost (£)	Cost (£)
Bidirectional power flow monitors	670	1,345	901,400
HV/LV Substations	16	22,474	359,584
Total			1,260,984

Table 2.25: HV monitoring proposal

Draft determination: D57n: HV monitoring

2.166 For the RP6 extension year determination, we determined an allowance of £10m for network monitors. The RP7 proposal is an extension to the original allowance, and we agree with the premise that further network monitoring will provide benefits in the form of more efficient network configuration, more efficient diagnoses and restoration of faults and better-informed planning decisions.

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct Cost (£k)
D57n HV Monitoring	NIE Networks' Proposal	LS	N/A	N/A	1,261
	Draft Determination	LS	N/A	N/A	1,261
	Total Change +/-				0
	Total Change %				0%

Table 2.26: D57n draft determination

Final determination

2.167 The company did not challenge our draft determination position and did not provide any further information therefore our draft determination position is now our final determination.

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct Cost (£k)
D57b Primary Network Reinforcement (Forward Power Flow)	NIE Networks' Proposal	LS	N/A	N/A	29,978
	Draft Determination	See Annex Q			26,980
	Final Determination	See Annex Q			29,661
D57c Secondary Network Reinforcement	NIE Networks' Proposal	LS	N/A	N/A	101,422
	Draft Determination	See Annex Q			101,400[14]
	Final Determination	See Annex Q			124,267[15]
D57l Primary Network Reinforcement (Reverse Power Flow)	NIE Networks' Proposal	LS	N/A	N/A	19,958
	Draft Determination	LS	N/A	N/A	17,963
	Final Determination	LS	N/A	N/A	17,963
D57n HV Monitoring	NIE Networks' Proposal	LS	N/A	N/A	1,261
	Draft Determination	LS	N/A	N/A	1,261
	Final Determination	LS	N/A	N/A	1,261
D57 Totals	NIE Networks' Proposal				152,620
	Draft Determination				147,603
	Final Determination				173,152

Table 2.27: D57 final determination summary

[14] Excludes TTNO
[15] Includes TTNO

3. Maintaining a Safe, Reliable and Resilient Network

3.1 This chapter includes the following programmes and values

Sub-programme	Submission Value (£k)	Our Assessment (£k)	Notes
D06: Distribution Tower Lines	2,390	2,259	
D07: 33kV Overhead Lines	21,005	17,628	
D08: 11kV Overhead Lines	12,958	227,686	
D09: LV Overhead Lines	5,628	5,445	
D10: LV Undereaves	10,654	12,775	
D11: Cutout Replacement	9,587	5,498	
D13: Primary Switchgear	29,903	29,223	See annex R
D14: 33/11kV Transformers	16,088	15,476	See annex R
D15: Secondary Switchgear	53,080	47,240	See annex R
D16: Distribution Cables	21,688	19,620	
D39: SCADA	4,803	4,440	See annex R
D41: Operational Telecoms	13,956	13,956	See annex R
D43: ESQCR	144,748	134,190	
D50: Climate Change Resilience	1,380	1,380	
D57m: High Impact Low Probability Events	4,087	3,821	
D101: Network Alterations	18,299	22,673	
D603: Distribution Protection	5,924	4,809	See annex R
D604: Connections Driven Systems Work	9,611	9,611	
D605: Network Access and Commissioning	9,514	9,514	
D701: Distribution Earthing	2,271	2,271	
D702: System Performance	13,719	13,719	
T10: 110kV Switchgear	1,565	1,048	See annex R
T11: 275kV Plant Ancillaries	3,815	3,658	See annex R
T12: 110kV Plant Ancillaries	11,322	10,680	See annex R
T13: 275/110kV Transformers	10,570	10,570	See annex R
T14: 110/33kV Transformers	9,073	8.898	See annex R
T15: 22kV Reactor Replacement	2,087	1,580	See annex R

Sub-programme	Submission Value (£k)	Our Assessment (£k)	Notes
T16: Transmission Transformer Refurbishment	1,416	1,256	See annex R
T17: 275kV Overhead Lines	18,696	18,823	See annex R
T19: 110kV Overhead Lines	18,204	17,093	See annex R
T20: Transmission Cables	4,702	4,316	See annex R
T602: Transmission Protection	5,697	5,547	See annex R
T603: Network Access and Commissioning T	2,274	2,274	
T701: Strategic Spares	4,414	4,356	See annex R
T702: Transmission Earthing	200	200	See annex R
Total	505,331	693,535	

Table 3.1: Maintaining a safe, reliable and resilient network summary

D06: Distribution tower lines

Scope of work

3.2 The majority of NIE Networks' overhead distribution system is supported by wood poles, however a proportion is supported by steel-lattice towers. NIE Networks operate 84km of distribution tower lines, consisting of twenty-five 33kV circuits, the majority of which are double circuit towers, and one circuit operating at 11kV.

3.3 The tower lines were built between the early 1930s and the early 1970s. Some of the circuits originally ran at a higher voltage but were downgraded to 33kV due to operational requirements, as an economical alternative to being replaced with wood pole lines. Some of the tower circuits were built to 110kV standards to allow for future upgrades, while the rest were built to the prevailing standard at the time, 69kV.

3.4 During RP6, investment in distribution tower lines was carried out under a lump sum general refurbishment programme, which consisted of minor works to address known defects where required and two bespoke programmes targeted to two specific circuits. The Eden Main - Carrickfergus West circuit was fully restrung and conductor fittings replaced. The Sprucefield - Lissue DC circuit was fully refurbished, which included replacement of severely corroded steel members, glass/porcelain insulators, corroded fittings and any other minor work as required.

NIE Networks' RP7 proposal

3.5 NIE Networks proposed RP7 distribution tower lines investment has been assigned to 14 new programmes targeted at specific assets and

components. This approach is a deviation from previous single refurbishment programme and circuit specific programmes but aligns more with the programmes carried out on the 110kV and 275kV transmission overhead line systems.

3.6 NIE Networks has set out its plans for investment in distribution tower lines in EJP 1.501 of its RP7 Network Investment Programme suite of documents. It submitted identical proposed unit costs for nine of the distribution tower lines programmes to that of its 110kV transmission overhead line programmes. These plans are summarised in Table 3.2 below, along with identification of 110kV programmes with the same proposed unit rate.

Sub-programme	UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)	110kV
D06d - Remedial Works	Lump Sum	N/A	N/A	100	
D06e - Replace Suspension Insulator Set	Tower Side	12	2.0	24	T19b
D06f - Replace Tension Insulator Set	Tower Side	18	10.1	183	T19c
D06g - Tower Painting	Tower	143	2.7	3814	T19e
D06h - Replace colour and number plates	Tower	72	0.6	39	T19g
D06i - Tower Foundation Assessment	Tower	72	2.6	184	T19h
D06j - Tower Foundation Repair	Tower	4	155.8	463	T19z
D06k - Tower Condition Assessment	Tower	90	0.5	49	
D06l - Tower Muff Repair	Each	72[16]	1.3	92	T19n
D06m - Tower Muff Painting	Tower	143	0.7	98	T19t
D06q - Tower Reconductoring	Span	30	16.4	493	
D06r - Earth Conductor Replacement	Span	20	5.1	103	
D06t - Conductor Sampling	Each	27	1.5	39	T19ac
D06u - Replacement fittings	Tower	24	0.441	11	T19aj
D06: Distribution Tower Lines Total				2,259	

Note 1. Figures may not sum due to rounding.

Table 3.2: NIE Networks' D06: distribution tower lines proposal

Draft determination

3.7 We agreed with the rationale to align the distribution tower lines programme with the transmission overhead line programmes, given the similarity in assets and components. Creating component specific programmes would contribute towards more targeted assessment and replacement than current

[16] NIE Networks revised its volume submission from 172

ad-hoc general refurbishment approach, and the measurable volumes will provide greater output transparency.

3.8 As all proposed expenditure for distribution tower lines has been assigned to new programmes, we had no direct outturn data to guide our assessment. The overall £2.39m proposed investment for RP7 is lower than the overall RP6 allowance of £2.84m. However, the RP7 total was higher than NIE Networks' actual and forecast expenditure for RP6 of £2.05m. NIE Networks' underspend is mainly outperformance in the two bespoke programmes targeted to specific circuits.

3.9 For the programmes where NIE Networks has proposed the same unit rate as 110kV programmes, we used our draft determination 110kV unit rates. While the material and labour requirements for the 33kV assets may be lower, we believed this was a reasonable approach for the following reasons:

- Parts of the 33kV network are constructed to 110kV standard.
- It is difficult to assess what effect on costs there is as a result of any reduced material and labour requirements, and a blanket percentage reduction may not be appropriate for all assets.
- 33kV works volumes are much lower, which may result in less opportunity for efficiencies, and therefore any reduced requirements may not result in reduced costs.

3.10 Our basis for the draft determination of the 110kV programmes with the same proposed unit rate, is set out in Table 3.3 below. Fuller details for these 110kV programmes can be found in Annex R.

33kV Programme	110kV Programme	110kV Draft Determination Rationale/Comments
D06e - Replace Suspension Insulator Set	T19b	10% reduction applied due to assessment data accuracy concerns.
D06f - Replace Tension Insulator Set	T19c	22% reduction due to removal of increase due to renegotiated contractor rates.
D06g - Tower Painting	T19e	6% reduction to align with RP6 to March 2023 outturn.
D06h - Replace colour and number plates	T19g	16% reduction to align with RP6 to March 2023 outturn.
D06i - Tower Foundation Assessment	T19h	14% reduction to align with RP6 to March 2023 outturn.
D06j - Tower Foundation Repair	T19z	13% reduction to match lower 275kV request.
D06l - Tower Muff Repair	T19n	70% reduction to align with RP6 to March 2023 outturn.
D06m - Tower Muff Painting	T19t	Accepted.
D06t - Conductor Sampling	T19ac	Accepted.
D06u - Replacement fittings	T19aj	Accepted.

Table 3.3: 33kV tower line related 110kV unit rate draft determination

3.11 We assessed the four other programmes, where the proposed unit rate is not the same as a 110kV programme, as follows:

- D06d Remedial Works - We have accepted the relatively small proposed lump sum of £100k, which will allow NIE Networks flexibility to deal with ad hoc issues.
- D06k tower condition assessment - We accepted proposed unit cost, which was 20% lower than request for similar 110kV programme (T19i), which we also accepted.
- D06q tower reconductoring - We hve accepted proposed unit cost, which was based on outturn of the RP6 Eden Main - Carrickfergus West circuit reconductoring programme.
- D06r earth conductor replacement - We accepted proposed unit cost, which we assessed against the RP6 110kV earthwire replacement programme, which is not continuing for RP7. NIE Networks' proposed unit cost is 12% lower.

3.12 We accepted the proposed volumes for all 33kV programmes. We reduced the 110kV programmes volumes in some cases due to accuracy concerns following the identification of errors in the handling of data. Given the much smaller volumes for the 33kV programme (75% lower on average) we did not

have the same concerns, and overall investment for RP7 was not a step change from RP6.

3.13 However, an error was identified in the tower muff repair (D06l) programme volume, which NIE Networks revised following our query[17]. The unit of measure for this programme was also inconsistent in the submission, with both per tower (4 x muffs) and per muff stated. NIE Networks clarified that it was per muff but given that the proposed unit cost was more than three times that of the 110kV programme RP6 outturn, we expected additional clarification during the consultation period.

Final determination

3.14 In its draft determination response NIE Networks queried the reduction in the 33kV programmes allowed unit costs by the same magnitude as the volume reductions for the related 110kV programmes. We accept this was an error in our published figures and the allowed unit costs should not have differed from those in the related 110kV programmes. This error applied to the following three programmes:

- D06e - Replace Suspension Insulator Set
- D06f - Replace Tension Insulator Set
- D06h - Replace colour and number plates

3.15 As with the draft determination we have used the outcome from our assessment of the 110kV programmes to set the unit rates for the related 33kV programmes. Fuller details on NIE Networks' response and our assessment for all 110kV tower programmes can be found in Annex R. Table 3.5 below provides brief detail on those 110kV programmes where the unit rate has been adjusted between the draft and final determination.

33kV Programme	110kV Programme	110kV Final Determination Unit Rate Adjustments Rationale/Comments
D06f - Replace Tension Insulator Set	T19c	Updated to include 2022/23 data and corrected to disallow 15% contractor uplift from contractor proportion of unit rate only.
D06l - Tower Muff Repair	T19n	Revised unit rate request accepted.
D06m - Tower Muff Painting	T19t	Revised unit rate request accepted.

Table 3.4: 33kV related 110kV final determination unit rate adjustments

[17] UR-0442

3.16 NIE Networks did not comment on the four 33kV tower programmes that are not aligned to 110kV programmes, and no adjustments have been made to these for the final determination.

3.17 Our final determination for direct investment in distribution tower lines is set out in Table 3.5 below.

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct (£k)
D06d - Remedial Works	NIE Networks' Proposal	Lump Sum	N/A	N/A	100
	Draft Determination	Lump Sum	N/A	N/A	100
	Final Determination	Lump Sum	N/A	N/A	100
D06e - Replace Suspension Insulator Set	NIE Networks' Proposal	Tower Side	12	2.0	24
	Draft Determination	Tower Side	12	1.8	21
	Final Determination	Tower Side	12	2.0	24
D06f - Replace Tension Insulator Set	NIE Networks' Proposal	Tower Side	18	10.7	192
	Draft Determination	Tower Side	18	8.3	150
	Final Determination	Tower Side	18	10.1	183
D06g - Tower Painting	NIE Networks' Proposal	Tower	143	2.8	404
	Draft Determination	Tower	143	2.7	381
	Final Determination	Tower	143	2.7	381
D06h - Replace colour and number plates	NIE Networks' Proposal	Tower	72	0.6	42
	Draft Determination	Tower	72	0.5	35
	Final Determination	Tower	72	0.5	39
D06i - Tower Foundation Assessment	NIE Networks' Proposal	Tower	72	3.0	213
	Draft Determination	Tower	72	2.6	184
	Final Determination	Tower	72	2.6	184
D06j - Tower Foundation Repair	NIE Networks' Proposal	Tower	4	132.9	532
	Draft Determination	Tower	4	115.8	463
	Final Determination	Tower	4	115.8	463
D06k - Tower Condition Assessment	NIE Networks' Proposal	Tower	90	0.5	49
	Draft Determination	Tower	90	0.5	49
	Final Determination	Tower	90	0.5	49
D06l - Tower Muff Repair	NIE Networks' Proposal	Each	72[18]	1.1	77
	Draft Determination	Each	72	0.3	23
	Final Determination	Each	72	1.3	92

[18] NIE Networks revised its volume submission from 172

D06m - Tower Muff Painting	NIE Networks' Proposal	Tower	143	0.8	113
	Draft Determination	Tower	143	0.8	113
	Final Determination	Tower	143	0.8	98
D06q - Tower Reconductoring	NIE Networks' Proposal	Span	30	16.4	493
	Draft Determination	Span	30	16.4	493
	Final Determination	Span	30	16.4	493
D06r - Earth Conductor Replacement	NIE Networks' Proposal	Span	20	5.1	103
	Draft Determination	Span	20	5.1	103
	Final Determination	Span	20	5.1	103
D06t - Conductor Sampling	NIE Networks' Proposal	Each	27	1.5	39
	Draft Determination	Each	27	1.5	39
	Final Determination	Each	27	1.5	39
D06u - Replacement fittings	NIE Networks' Proposal	Tower	24	0.4	11
	Draft Determination	Tower	24	0.4	11
	Final Determination	Tower	24	0.4	11
D06: Distribution Tower Lines Total	NIE Networks' Proposal				2,390
	Draft Determination				2,166
	Final Determination				2,259

Note 1. Figures may not sum due to rounding.

Table 3.5: D06: Distribution tower lines final determination

D07: 33kV overhead lines

Scope of work

3.18 The D07 33kV overhead lines (OHL) programmes refer to the wood pole supported part of the 33kV OHL network. There is approximately 3,110km of this network that it is generally configured as radial or ring circuits with very few spur lines. The circuits supply relatively large 33/11kV substations however there are sections that continue to supply both small villages and individual customers via smaller 33kV/LV pole mounted transformers.

3.19 During RP6 NIE Networks executed the following activities on the 33kV wood pole OHL network:

a) D07a 33kV re-engineering - replacement and more intensive refurbishment of network components, based on a 45-year cycle.

b) D07b 33kV refurbishment - lighter refurbishment of network components, based on a 15-year cycle.

c) D07d remedial works - replacement of defective components found whilst patrolling or during other works (outside of the normal refurbishment cycle).

NIE Networks' RP7 proposal

3.20 NIE Networks' 33kV OHL wood pole network RP7 proposals include the continuation of the re-engineering and refurbishment programmes but discontinuing the remedial works programme. It has also proposed the addition of the following three new programmes:

a) D07e undergrounding - replace parts of the 33kV OHL network that are difficult to access for maintenance with underground cable. Similar programmes exist for the LV and 11kV OHL networks.

b) D07l air-break switch disconnector (ABSD) replacement - replace all ABSDs with low load-breaking capability by the end of RP7, outside those that will be addressed by the RP7 re-engineering programme.

c) D07m automated switch replacement - replace poor condition and design defective automated switches.

3.21 NIE Networks out its plans for investment in EJP 1.502 and EJP 1.504 of its RP7 network investment programme suite of documents. These plans are summarised in Table 3.6 below.

Sub-programme	UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D07a - Re-Engineering (33kV)	km	420	35.3	14,845
D07b - Refurbishment (33kV)	km	840	2.6	2,179
D07e - Undergrounding	Lump Sum	N/A	N/A	3,702
D07l - ABSD Replacement	Each	60	3.2	195
D07m - Replace Automated Switches	Each	8	10.6	85
D07: 33kV Overhead Lines Total				21,005

Note 1. Figures may not sum due to rounding.

Table 3.6: NIE Networks' D07: 33kV wood pole overhead lines proposal

Draft determination

3.22 We accepted the proposed volume of activity for the re-engineering and refurbishment programmes. They were consistent with what would be expected to be addressed over the six-year RP7 period to meet the requirements of the respective 45-year and 15-year cycles.

3.23 We did not accept the proposed unit costs for the re-engineering and refurbishment programmes, particularly the uplift as a result of the retendered overhead line contract in the second half of 2022.

3.24 To reflect the new contract, NIE Networks had added a 62% increase to the OHL contractor proportion of the RP6 outturn unit costs to date. It also submitted this proposed increase during the RP6 extension year process.

3.25 During RP6 extension process we assessed NIE Networks' proposed uplift and determined that 45% would apply for that process. At the draft determination for RP7 we applied the same uplift overall but have factored in the positive ~4% frontier shift that will be applied to all capex programmes following our RP7 assessment of industry input costs, inflation and productivity. We therefore uplifted the OHL contractor proportion of the RP6 outturn unit rates by 39% prior to the application of frontier shift.

3.26 In addition to the uplift due to the retendered OHL contract, NIE Networks proposed a small (£85/km) uplift on both the re-engineering and refurbishment programmes unit cost to address clearance issues. This activity was reported separately during RP6 under ESQCR compliance programme D43f, but no further funding has been requested for that programme. The proposed uplift was set at the RP6 outturn for the discontinued D43f programme. We therefore accepted this additional amount on both the re-engineering and refurbishment programmes unit costs.

3.27 We accepted the proposed new 33kV undergrounding programme. As with the existing similar programmes for the LV and 11kV OHL networks, undergrounding is often the most cost-effective solution to the complications in maintaining difficult to access OHL network.

3.28 In our assessment of proposed costs, we reviewed the identified seven undergrounding projects in NIE Networks' submission. Through the submission and subsequent queries[19], we received data on the length of OHL to be recovered, the length of replacement underground cable to be installed and the rationale for undergrounding.

3.29 The laying of new underground cable attracts the greatest proportion of costs in an undergrounding project. We assessed the proposed projects' costs and underground cable lengths using the RP6 outturn costs from 33kV underground cable replacement programme D16m, which gave us a proxy unit cost for the recovery of OHL. We found projected costs to be reasonable and have therefore accepted NIE Networks' proposed expenditure.

[19] UR-0092, UR-0405

3.30 We considered whether a unitised allowance could be set for the undergrounding investment, rather than a lump sum. We assessed basing a unitised allowance on the length of OHL line recovered, but there could be wide variation between those lengths and the subsequent length of underground cable installed. We have therefore agreed with NIE Networks' proposal to set a lump sum for this programme.

3.31 The new ABSD replacement programme is aimed at replacing all those with low load-breaking capability by the end of RP7. This programme will complement the replacements being carried out under the re-engineering programme.

3.32 There is increased utilisation of the 33kV network due to both increased load and bi-directional flows as result of connected generation. The ABSDs targeted for replacement were suitable at the time of installation, but their use could now be restricted during certain fault conditions that would detrimentally affect network operation and restoration of customers.

3.33 Therefore, we agreed with NIE Networks' proposal to remove all ABSDs with low load-breaking capacity by the end of RP7 and accepted the proposed volumes.

3.34 As this is a new programme, we had no outturn costs to assess the proposed unit cost against. There is related data reported in the cost and volumes RIGs, and following assessment of this we found the average RP6 outturn unit cost to be £4,901, which is 51% higher than NIE Networks' proposal. We have therefore accepted the proposed unit cost.

3.35 We accepted the new 33kV automated switch replacement programme. These devices allow automatic or remote reconfiguration of the network to restore supplies customers in the event of a fault and control the loading of circuits.

3.36 NIE Networks has experienced repeat failures in the operation of some of these devices due to design defects, that maintenance and refurbishment activities have been unable to resolve. It will target replacing these eight defective switches during RP7 and will continue to refurbish others via other 33kV programmes.

3.37 At the draft determination, we had no outturn data on which to base our determination but subtracting the determined cost of replacing the ABSD switch, from the proposed unit cost leaves £7,320 to cover the cost of power source, servos and antennae. The additional equipment will also attract additional installation costs, therefore, in our judgement, we conclude that the proposed cost is efficient.

Final determination

3.38 In its draft determination response, NIE Networks disagreed with UR's adjustments to the D07a - Re-Engineering and D07b - Refurbishment programmes. It argued that the uplift UR applied to the contractor element was insufficient and was based on a mistaken understanding of how inflation was reflected in the underlying data.

3.39 For the RP6 extension year determination we scrutinised and assessed the requested OHL contractor uplift and deemed an uplift of 45% was appropriate. Our draft determination uplift calculation of 39% factored in the positive frontier shift position at that time to achieve parity with the RP6 extension year allowed uplift.

3.40 The RP6 extension year and RP7 draft determination allowed uplifts were made in the absence of outturn data that would reflect the impact of the updated contractor costs on the overall outturn unit rate. Following receipt of the 2023/24 RIGs we now have a full year of outturn costs at the new contractor rates to assess.

3.41 For the D07a - Re-Engineering programme the 2023/24 year outturn costs were £27.23k/km, which is significantly lower than the company's requested £35.35k/km and our draft determination position of £30.87k/km. It is our view that the actual outturn data, which has shown that the company's requested allowance is not materialising, will best reflect the new OHL contract rates. Therefore, for the final determination we are setting the allowed unit costs at the 2023/24 year outturn.

3.42 For the D07b - Refurbishment programme the 2023/24 year outturn costs were £3.90k/km, which is significantly higher than the company's requested £2.59k/km and our draft determination position of £2.50k/km. It is our view that the actual outturn data has shown that the company's requested allowance is materialising. Therefore, for the final determination we are setting the allowed unit costs in line with the company's request.

3.43 NIE Networks did not comment on our draft determination for the other 33kV wood pole OHL programmes, and no adjustments have been made to these for the final determination.

3.44 Our final determination for direct investment in 33kV wood pole OHL is set out in Table 3.7 below.

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D07a - Re-Engineering (33kV)	NIE Networks' Proposal	Km	420	35.3	14,845
	Draft Determination	Km	420	30.9	12,964
	Final Determination	Km	420	27.3	11,468
D07b - Refurbishment (33kV)	NIE Networks' Proposal	Km	840	2.6	2,179
	Draft Determination	Km	840	2.5	2,108
	Final Determination	Km	840	2.6	2,179
D07e - 33kV Undergrounding	NIE Networks' Proposal	LS	N/A	N/A	3,702
	Draft Determination	LS	N/A	N/A	3,702
	Final Determination	LS	N/A	N/A	3,702
D07l - ABSD Replacement	NIE Networks' Proposal	Each	60	3.2	195
	Draft Determination	Each	60	3.2	195
	Final Determination	Each	60	3.2	195
D07m - Replace Automated Switches	NIE Networks' Proposal	Each	8	10.6	85
	Draft Determination	Each	8	10.6	85
	Final Determination	Each	8	10.6	85
D07: 33kV Overhead Lines Total	NIE Networks' Proposal				21,005
	Draft Determination				19,052
	Final Determination				17,628

Note 1. Figures may not sum due to rounding.

Table 3.7: D07: 33kV wood pole overhead lines final determination

3.45 Although we have agreed with NIE Networks' proposal to set a lump sum for the D07e undergrounding programme, we expect it to retain and be able to provide data on outturn lengths recovered and installed, as well as the split in costs.

D08: 11kV overhead lines

Scope of work

3.46 The 11kV overhead lines work programme comprises works associated with high voltage overhead lines supported mainly on wood poles.

3.47 During RP6 NIE Networks carried out several sub-programmes which were:

a) 11kV Re-engineer: Rebuilding the main lines with larger capacity conductor and refurbishing the associated spur lines

3.48 11kV Refurbishment: Condition based replacement of defective components

a) Remedial Works: Replacement of defective components found whilst patrolling or during other works (outside of the normal refurbishment cycle)

b) Undergrounding: Typically related to the undergrounding of existing overhead lines into substations where population growth has occurred

NIE Networks' RP7 proposal

3.49 NIE Networks has made some fundamental changes to its approach to 11kV overhead lines for RP7.

3.50 The main difference is the change in specification for 11kV overhead line maintenance. The categories of re-engineer and refurbishment have been amalgamated to allow the replacement of low-capacity conductors and transformers across the entire network. This is due to forecast LCT uptake and is dealt with in Chapter 2.

3.51 The requirements for undergrounding and remedial works have remained broadly unchanged from RP6.

3.52 A new category for dealing with bird fouling has been proposed for RP7. This funding is to deal with sections of overhead line oversailing residential housing and gardens which provides perches for roosting birds. This causes bird fouling on and around the property with the subsequent health hazards and inconvenience. The proposal centres on the fitting of a new bird anti-perch device which is lighter than the devices used in the past and this means that the whole span can be treated without exceeding wind span design criteria.

3.53 A further two new categories are proposed for RP7 and these deal with the replacement of ABSDs. Many ABSDs on the system are not capable of breaking fault load. As load increases on the system this may become a health and safety issue for engineers operating the switches in the field, so it is proposed to replace these switches with uprated equipment.

3.54 The second category is for replacing a certain type of automated switch that contains known design defects.

3.55 NIE Networks set out its plans for 11kV overhead lines in EJPs 1.503, 1.504 and 1.506 per Table 3.8 below.

Sub-programme	EJP	UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D08d: Undergrounding	1.503	LS	N/A	N/A	1,322
D08e: Remedial Works	1.503	LS	N/A	N/A	3,063
D08i: Bird Fouling	1.506	LS	N/A	N/A	7,814
D08k: Switches	1.503	Ea	240	2.3	548
D08l: Automated Switches	1.504	Ea	20	10.6	211
D08 Total					12,958

Table 3.8: NIE Networks D08 proposal

Draft determination

D08d: Undergrounding

3.56 For its RP7 undergrounding proposal, NIE Networks has identified 8 separate projects where sections of overhead line are required to be undergrounded mainly due to the difficulty of accessing poor condition assets. These landlocked assets are situated in residential gardens and replacement in situ would cause future access issues.

3.57 The costed proposals identify the length of underground cable to be installed and the length of overhead line to be dismantled.

3.58 In query UR-0053 we informed NIE Networks that its calculated costs contained spurious values for overhead line dismantlement when we substituted in the known outturn cost of installing 11kV. We further requested sketches of each proposed site to ensure we understood the nature of the works.

3.59 NIE Networks responded that using the historic outturn cost for cable installation would not be appropriate due to the complexity of each site.

3.60 Upon assessing the sketches provided by NIE Networks we disagreed with its opinion that the projects are complex and out of the ordinary. The historic outturn rate for cable installation covers multiple projects and multiple levels of complexity and therefore is deemed to be appropriate as a proxy cost for cable installation on these projects. Our calculation of costs are shown in Table 3.9

Project	Total Cost	OHL Recovery (M)	Cable Install (M)	Proxy Install Cost (£)	Recovery Cost (£)	Recovery Unit Cost (£)
Greenmount, Coleraine	130,068	500	1,255	91	15,863	32
Gulladuff	625,076	1,751	1,600	91	479,476	274
Linn Primary School, Larne	212,872	1,578	2,061	91	25,321	16
Ramona Rd 'B', Ballycastle	134,351	654	1,257	91	19,964	31
Bushmills Rd, Coleraine	97,580	820	947	91	11,403	14
Bells Lane, Lisburn	2,200	1,329	0	91	2,200	2
Scallions Rd, Mallusk	40,000	200	400	91	3,600	18
Trench Rd, Mallusk	80,000	730	780	91	9,020	12
	1,322,147	7,562	8,300			

Table 3.9: UR calculation of costs

3.61 The median unit cost for recovery of overhead line is calculated from Table 3.8 as £17/m[20] which we consider to be a reasonable cost for the nature of the dismantlement. The median unit cost multiplied by the total recovery length equates to £128,729

3.62 The proxy install cost multiplied by the total cable install length equates to £755,300. This leads us to the conclusion that the efficient allowance for the proposed works is £884,029.

D08e: Remedial works

3.63 Our assessment of NIE Networks remedial works historic outturn costs revealed average expenditure per annum of £463,470. We found no evidence in NIE Networks business plan submission to persuade us that a higher amount per annum will be necessary in RP7, We, therefore base our decision on the historic outturn costs per annum multiplied by RP7 duration of 6 years.

D08i: Bird fouling

3.64 Bird fouling is a new sub-programme; therefore, we had no outturn costs with which to guide our determination. We did, however, agree that this issue needs to be addressed and cannot be dealt with without the socialisation of costs.

3.65 In its submission, NIE Networks provided a list of 12 trial projects and the associated costs which it has carried out in RP6. The submission also

[20] Equates to £1,360/span assuming 80m span length

contained sketches for 3 of the 12 projects. In query UR-0196 we requested sketches for all trial sites together with the total length of anti-perch devices fitted and the number of spans affected

3.66 For the draft determination, we used the information provided to calculate the data shown in Table 3.10 below

Site Location	Number of customers involved	Cost (£)	Length of devices fitted (M)	Spans affected	Cost/Customer (£)	Customers /span
Islandmagee	12	6,000	1,098	6	500	2.0
Cogry, Doagh	9	3,047	540	3	339	3.0
Glebe Park, Sion Mills	6	1,272	432	2	212	3.0
Canvey Manor and Charnwood Court	11	9,595	678	4	872	2.8
4 Sandy Hill Gardens, Dunmurry	9	3,119	774	4	347	2.3
Caherty Hill, Broughshane	11	6,660	675	3	605	3.7
Bridge Park, Templepatrick	10	6,967	1,017	5	697	2.0
St Patricks Way	7	5,346	588	3	764	2.3
Marie Villas, Newry	22	10,859	1,611	11	494	2.0
Loughshore Manor, Enniskillen	6	4,640	205	2	773	3.0
Cherrylands, Newtownabbey	15	5,857	564	3	390	5.0
Ardmore, Holywood	8	5,734	1,017	6	717	1.3
	126	69,096	9,199	52		

Table 3.10: Trial data

3.67 From the above data we calculated the average cost per customer was £548[21] and the average number of customers per site is 10.5[22].

3.68 NIE Networks stated in its submission[23] that it expects 600+ complaints in RP7 so we used 700 for our estimation and, in addition, recognised the 281 sites already identified by the company. This gives an estimated total of 981 sites requiring remediation in RP7.

[21] £69,096 ÷ 126 customers = £548/customer
[22] 126 customers ÷ 12 sites = 10.5 customers/site
[23] EJP 1.506, Paragraph 4.1

3.69 We concluded that 981 sites with, on average, 10.5 customers per site equates 10,300 customers @ £548ea gives an efficient allowance of £5,648,324 for RP7.

D08k: Replace switches

3.70 Replacement of pole mounted air break switch disconnectors is a new sub-programme, however, the costs of replacement are recorded in the distribution cost and volume RIGs. We were not confident in the accuracy of RP5 data, so we used only RP6 data to derive an average cost. The RIGs data returned an average cost for replacement of £2,547. This was very close to the requested unit cost of £2,283, therefore we concluded that the proposed unit cost is efficient.

3.71 We raised query UR-0028 to request data from NIE Networks regarding the volume of switches requiring replacement. NIE Networks stated in its response that most of the non-load breaking ABSDs will be replaced under the 11kV rebuild programme, but it estimated that around 240 will require replacement under a stand-alone programme. We were content with the volumes proposed.

D08l: Replace automated switches

3.72 We have no outturn data on which to base our draft determination, however, if we subtract the cost of replacing the switch, determined above, from the proposed unit cost[24] this leaves £8,280 to cover the cost of power source, servos and antennae. The additional equipment will also attract additional installation costs, therefore, we conclude that the proposed cost is efficient.

[24] £10,563

Sub-programme	UoM		Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D08d: 11kV Undergrounding	LS	NIE Networks' Proposal	N/A	N/A	1,322
	LS	Draft Determination	N/A	N/A	764
D08e: Remedial Works	LS	NIE Networks' Proposal	N/A	N/A	3,063
	LS	Draft Determination	N/A	N/A	2,781
D08i: Bird Fouling	LS	NIE Networks' Proposal	N/A	N/A	7,814
	LS	Draft Determination	10,300	0.5	5,648
D08k: Replace Switches	Ea	NIE Networks' Proposal	240	2.3	548
	Ea	Draft Determination	240	2.3	548
D08l: Replace Automated Switches	Ea	NIE Networks' Proposal	20	10.6	211
	Ea	Draft Determination	20	10.6	211
D08	NIE Networks' Proposal				12,958
	Draft Determination				9,952
	Total Change +/-				-3,006
	Total Change %				-23%

Table 3.11: D08 draft determination

D08 final determination

3.73 In its response to our draft determination, NIE Networks disagreed with our assessment of bird fouling costs. The company stated that we had set the allowance based on a metric that would be difficult to measure in the event that deferral was required at the conclusion of the price control. It also stated that our calculation of the allowance was incorrect and provided its own calculation which resulted in a reduced requirement of £6.2m.

3.74 After further engagement with NIE Networks we concluded that the company's calculation was incorrect and that our draft determination allowance was reasonable. We did, however, agree with the company's position that the unit of measure was not suitable, and, for our final determination, we will use cost per span instead of cost per customer. The draft determination funding remains unchanged.

3.75 NIE Networks did not comment on our draft determination for all other sub-programmes in this category, and no further adjustments have been made to these for the final determination.

Sub-programme	UoM		Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D08d: 11kV Undergrounding	LS	NIE Networks' Proposal	N/A	N/A	1,322
	LS	Draft Determination	N/A	N/A	764
	LS	Final Determination	N/A	N/A	764
D08e: Remedial Works	LS	NIE Networks' Proposal	N/A	N/A	3,063
	LS	Draft Determination	N/A	N/A	2,781
	LS	Final Determination	N/A	N/A	2,781
D08i: Bird Fouling	LS	NIE Networks' Proposal	N/A	N/A	7,814
	Property	Draft Determination	10,300	0.5	5,648
	Span	FinalDetermination	4,251	1.3	5,649
D08k: Replace Switches	Ea	NIE Networks' Proposal	240	2.3	547
	Ea	Draft Determination	240	2.3	547
	Ea	Draft Determination	240	2.3	547
D08l: Replace Automated Switches	Ea	NIE Networks' Proposal	20	10.6	211
	Ea	Draft Determination	20	10.6	211
	Ea	Final Determination	20	10.6	211
D08	NIE Networks' Proposal				12,958
	Draft Determination				9,952
	Final Determination				9,952

Note 1. Figures may not sum due to rounding.

Table 3.12: D08 final determination

D09: Low voltage overhead lines

Scope of work

3.76 The LV overhead lines (OHL) network in Northern Ireland primarily comprises of lines supported on wood poles. There is approximately 7,050km of this network which includes both mains and service conductors, and it is mainly located in urban areas to deliver electricity to end users.

3.77 During RP6 NIE Networks executed the following activities on the LV OHL network:

- A combined LV clearances and OHL refurbishment programme (D43d), that was aimed at addressing infringements to ensure ESQCR compliance, whilst at the same time addressing poor asset condition. This is main LV OHL investment area, but we assess this programme in the ESQCR section beginning at Paragraph 3.196.
- A remedial programme (D09e) to address defects outside of the refurbishment programme, identified by routine inspections or customer notification.
- Undergrounding programmes, where NIE Networks' chosen solution is to replace parts of the overhead line network, that are difficult to access, with underground LV cable. During RP6 there were two programmes of this type, Direct Access (D09c) or Land-Locked (D09d).

NIE Networks’ RP7 proposal

3.78 NIE Networks' RP7 proposals for the LV OHL D09 programmes include the continuation of both the remedial and undergrounding activities. However, its proposal for undergrounding activities is a change from the RP6 approach. It has proposed a single undergrounding programme with a lump sum allowance to replace the existing two programmes; direct access and land-locked, which had unitised allowances based on the length of OHL recovered.

3.79 NIE Networks set out its plans for investment in EJP 1.508 of its RP7 network investment programme suite of documents. These plans are summarised in Table 3.13 below.

Sub-programme	UoM	Total Direct Proposal (£k)
D09e – LV Remedial Works	Lump Sum	1,526
D09g – LV Undergrounding	Lump Sum	4,102
D09: LV Overhead Lines Total		5,628

Note 1. Figures may not sum due to rounding.

Table 3.13: NIE Networks' D09: LV OHL proposal

Draft determination

3.80 NIE Networks' submission for the LV remedial works programme was based on the outturn annual average expenditure for RP6 through March 2022. It has been overspending the RP6 allowance by 82% on an annual basis, so it has proposed an increase in the RP7 allowance. This overspend was caused by increased levels of defects discovered because of increased network inspection.

3.81 Despite the increased LV OHL refurbishment through the D43d programme, NIE Networks anticipates the need to maintain its RP6 remedial works expenditure level. It anticipates that a reduction in defects, as result of activity through the refurbishment and remedial programmes, will not occur until RP8.

3.82 We were broadly in agreement with NIE Networks in setting the level of expenditure based on the RP6 outturn. However, we received data from the 2023 reporting year subsequent to the RP7 business plan submission and found there was 67% reduction compared to the annual average from the prior RP6 years. This data contradicted some of the submission commentary on the need to maintain the higher level of expenditure, but there may be other factors we are unaware of. We included this additional year in setting the allowance based on the RP6 annual average, which results in a 12% decrease from NIE Networks' proposal.

3.83 NIE Networks' submission for the new LV undergrounding programme was based on the total level of activity and expenditure it had experienced in RP6 across the two existing LV undergrounding programmes. It submitted a list of 28 projects it had identified, with the length of OHL to be recovered, 17km total, and estimated costs for each.

3.84 Following our query[25] on the rationale behind amalgamating the programmes, it detailed that there was often a mix of both land-locked and direct access sections under individual undergrounding projects. As result,

[25] UR-0387

allocating the project costs and outputs to a particular programme was not accurate.

3.85 We also queried[26] NIE Networks' proposal that the new undergrounding programme should be a lump sum allowance, which is a change from the existing programmes that are unitised on the length of OHL recovered. The response detailed that the length of underground cable installed in an undergrounding project was the most significant cost driver, and there could be significant variation of length of underground cable versus the length of OHL recovered.

3.86 In response to a further query[27], NIE Networks provided the estimated length of underground cable to be installed for each of the 28 projects it had identified. We found there could be significant variation between length recovered versus installed, with a ratio ranging from 0.9 to 3.5. We have therefore agreed with NIE Networks' proposal to set a lump sum for this programme, and this aligns with the approach for the existing 11kV and new 33kV undergrounding programmes.

3.87 In our assessment of proposed costs, we reviewed the identified 28 undergrounding projects in NIE Networks' submission. The laying of new underground cable attracts the greatest proportion of costs in an undergrounding project. We assessed the proposed projects' costs and underground cable lengths using the RP6 outturn costs from LV underground cable replacement programme D16j, which gave us a proxy unit cost for the recovery of OHL. We found projected costs to be reasonable.

3.88 We also assessed the proposed costs against the outturn costs across the two RP6 undergrounding programmes. Only the length of OHL recovered was reported for these programmes, but when comparing the RP7 submission like for like, the proposed RP7 costs were 10% lower.

3.89 The proposed RP7 expenditure is a 2% reduction compared to the RP6 outturn, on an annual average basis. NIE Networks RP7 strategy is to underground worst condition OHL network only, rather than all OHL network that is difficult to access. We find this approach and total level of expenditure to be reasonable.

[26] UR-0387
[27] UR-0406

Final determination

3.90 NIE Networks did not comment on our draft determination for the D09 LV OHL programmes, and no adjustments have been made for the final determination.

3.91 Our final determination for direct investment in the D09 LV OHL programmes is set out in Table 3.14 below.

Sub-programme		UoM	Total Direct Proposal (£k)
D09e - LV Remedial Works	NIE Networks' Proposal	Lump Sum	1,526
	Draft Determination	Lump Sum	1,343
	Final Determination	Lump Sum	1,343
D09g - LV Undergrounding	NIE Networks' Proposal	Lump Sum	4,102
	Draft Determination	Lump Sum	4,102
	Final Determination	Lump Sum	4,102
D09: LV Overhead Lines Total	NIE Networks' Proposal		5,628
	Draft Determination		5,445
	Final Determination		5,445

Note 1. Figures may not sum due to rounding.

Table 3.14: D09: LV overhead lines final determination

3.92 Although we have agreed with NIE Networks' proposal to set a lump sum for the D09g undergrounding programme, we expect it to retain and be able to provide data on outturn lengths recovered and installed, as well as the split in costs.

D10: Undereaves

Scope of work

3.93 Undereaves mains consist of a bundle of four insulated cables (3 phases and neutral) attached to the brickwork, facia or soffit of the property being supplied. Single or three phase services are connected to the mains and are clipped directly to the walls of the property being supplied. This form of supply was installed between the 1950s and the 1970s and was considered to be a low-cost alternative to underground cabling.

3.94 Several insulation types have been utilised on undereaves mains and services. The oldest cables still in commission were insulated with PolyButylJute (PBJ), this type of insulation deteriorates over time. First the jute outer serving rots and falls away from the cable then the polybutyl rubber insulation becomes brittle and forms cracks which expose the live

core of the cable. The undereaves wiring is readily accessible to members of the public cleaning windows or carrying out maintenance to eaves woodwork, hence exposed live conductors represent a danger.

3.95 NIE Networks discontinued the use of PBJ insulation in the early 1970s and, instead, utilised a cable with a single layer of PolyVinylChloride (PVC) insulation referred to as “single insulated”. PVC is much more stable than PBJ insulation but is still prone to cracking over time due to exposure to ultra-violet light.

3.96 Wiring regulations were updated in the late 1970s and the requirement to have mechanical protection over primary insulation came into being. NIE Networks began to use PVC insulated and PVC sheathed cables referred to as “double insulated”. These cables provide better mechanical protection and are less prone to exposure of live conductors.

3.97 NIE Networks currently replace poor condition LV undereaves assets using one of the following:

- Aerial bundled conductor (ABC), a preformed bundle of four single core cables insulated with PVC or Cross-linked PolyEthylene (XLPE). The thickness and grade of insulation provide insulation and protection in one layer and the material is pre-treated to prevent degradation through exposure to ultra-violet light.
- PVC/PVC (double insulated) copper conductor.
- Underground cable, where the option to replace the undereaves conductor in situ is not available.

3.98 During RP6 NIE Networks prioritised the replacement of PBJ-insulated conductors and have stated that all known conductors of this type will be replaced by the end of RP6. It also started to address single layer PVC insulated conductors as these are next highest priority.

NIE Networks' RP7 Proposal

3.99 NIE Networks has set out its plans for investment in Undereaves in EJP 1.507 of its RP7 Network Investment Programme suite of documents. These plans are summarised in Table 3.15 below.

Sub-programme	UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D10a – Replace 0.4kV mains and services (Undereaves)	Each	17,000	0.627	10,654

Table 3.15: NIE Networks' D10: Undereaves proposal

3.100 With all known PBJ-insulated conductors expected to be addressed in RP6, the proposed RP7 programme is aimed completing the replacement of all single layer PVC insulated conductors remaining on the network. NIE Networks is targeting all this asset type, not just those in poor condition. This proposal is because of a risk assessment NIE Networks conducted to meet the requirements of ESQCR legislation, which indicates that aged single layer PVC is not effectively insulated and poses a risk of personal injury through inadvertent physical contact with exposed conductors.

3.101 NIE Networks is targeting the replacement of LV undereaves assets at 17,000 properties under the standalone undereaves programme (D10a), with a further 8,000 properties estimated to be addressed under the LV overhead line refurbishment programme (D43d) proposals. However, with the exact number to be addressed under the LV overhead line refurbishment programme being uncertain, it has requested that the RP6 volume driver mechanism be maintained for the RP7 undereaves programme (D10a).

3.102 NIE Networks' submitted unit cost for RP7 was based on RP6 outturn costs to March 2022, with the contractor proportion of the costs uplifted to reflect its overhead lines contract that was retendered in the second half of 2022.

Draft determination

3.103 We accepted the proposed total volume of 25,000 undereaves to be addressed in RP7. This will allow NIE Networks to remove all remaining single layer PVC insulated conductors by the end of RP7. However, we did not agree with the proposals to apportion undereaves works to the LV overhead line refurbishment programme (D43d). To monitor costs and output effectively, all similar works should be reported under the same category. We therefore disallowed the expenditure and outputs from the LV overhead line refurbishment programme (D43d) proposed to address 8,000 undereaves. The volume cap for the standalone undereaves programme was set at 25,000 to compensate.

3.104 The volume to be addressed is no longer uncertain and a determined volume could be set. However, we will retain the volume driver for this programme, with volume capped at 25,000 properties. There would be no benefit to discontinuing the volume driver mechanism, and retaining the existing mechanism will minimise licence modifications.

3.105 We did not accepted NIE Networks' proposed unit cost, particularly the uplift as a result of the retendered overhead line contract in the second half of 2022.

3.106 To reflect the new contract, NIE Networks had added a 62% increase to the OHL contractor proportion of the RP6 outturn unit costs to date. It also submitted this proposed increase during the RP6 extension year process.

3.107 During RP6 extension process we assessed NIE Networks' proposed uplift and determined that 45% would apply for that process. At the draft determination, we will applied the same uplift overall but have factored in the positive ~4% frontier shift that will be applied to all capex programmes following our RP7 assessment of industry input costs, inflation and productivity. We set the draft determination unit rate at the RP6 outturn, with the OHL contractor proportion uplifted by 39%, prior to the application of frontier shift.

Final determination

3.108 NIE Networks did not comment on our draft determination for undereaves. However, we have reviewed the draft determination allowed uplift for the new OHL contract. For the RP6 extension year determination we scrutinised and assessed the requested OHL contractor uplift and deemed an uplift of 45% was appropriate. Our draft determination uplift calculation of 39% factored in the positive frontier shift position at that time to achieve parity with the RP6 extension year allowed uplift.

3.109 The RP6 extension year and RP7 draft determination allowed uplifts were made in the absence of outturn data that would reflect the impact of the updated contractor costs on the overall outturn unit rate. Following receipt of the 2023/24 RIGs we now have a full year of outturn costs at the new contractor rates to assess.

3.110 For the D10a - Undereaves programme the 2023/24 year outturn costs were £511 per property, which is significantly lower than the company's requested £627 per property and our draft determination position of £579 per property. It is our view that the actual outturn data, which has shown that the company's requested allowance is not materialising, will best reflect the new OHL contract rates. Therefore, for the final determination we are setting the allowed unit costs at the 2023/24 year outturn.

3.111 Our forecast final determination of direct investment in RP7 for undereaves is shown in Table 3.16 below.

Sub-programme	UoM		Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D10a – Replace 0.4kV mains and services (Undereaves)	Each	NIE Networks' Proposal	17,000	0.6	10,654
		Draft Determination	25,000	0.6	14,486
		Final Determination	25,000	0.5	12,775

Table 3.16: D10: Undereaves final determination

3.112 For the undereaves programme, allowances are based on our determined unit cost and the actual volume of units delivered in a reporting year, with tariffs then adjusted for the following year. As this programme is volume driven, it is not eligible for the substitution mechanism.

D11: Service cut-outs

Scope of work

3.113 Most LV service cables to consumer premises are terminated in a service cut-out with a fuse which is located before the meter and the subsequent customer's consumer unit/fuse board. The cut-out fuse provides protection against overload of the service and provides back-up fault protection to the meter and customer's installation.

3.114 NIE Networks categorise cut-out replacements into the following types:

- Simple – Equipment can be replaced in-situ with no other modifications required;
- Complex – Replacement work often requires external excavation and reinstatement and internal modifications to property.

3.115 The RP6 mix of works, forecast by NIE Networks, was 90% simple and 10% complex.

NIE Networks' RP7 proposal

3.116 NIE Networks set out its plans for investment in cut-outs in EJP 1.505 of its RP7 Network Investment Programme suite of documents. These plans are summarised in Table 3.17 below.

Sub-programme	UoM	Replacement Type	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D11a – Replace Service Cut-outs	Each	Condition based	9,000	0.3	1,748
		LCT Uptake	874		
D11b – Replace Service Cut-outs (Three-phase or Complex)	Each	Condition based	6,000	1.1	7,839
		LCT Uptake	582		
D11: Service Cut-Outs Total					9,587

Note 1. Figures may not sum due to rounding.

Table 3.17: NIE Networks' D11: Service cut-outs proposal

3.117 NIE Networks proposed a new separate sub-programme to carry out complex service cut-out replacements, leaving existing RP6 sub-programme for simple cut-out replacements only. Included in the new complex sub-programme is three-phase service cut-outs, which have not been targeted for replacement previously.

3.118 NIE Networks stated the justification for splitting of the existing programme was due to the mix of simple versus complex job types it had identified throughout RP6, with complex job types to be addressed increasing to 40%. Therefore, given the magnitude of difference in the tasks involved between simple versus complex/three-phase job types, a blended unit rate based on a 90:10 split was not appropriate.

3.119 NIE Networks' proposed volume consists of 15,000 condition-based replacements, across the two sub-programmes, with a further 1,456 replacements driven by consumer uptake of LCTs.

3.120 When a consumer is installing LCTs such as an EV charge point and/or heat pump, their existing older type of cut-out may need to be replaced as it is insufficiently rated. In these circumstances, the consumers cut-out would be replaced with a modern equivalent within each customers agreed connection capacity and in accordance with health and safety requirements.

3.121 NIE Networks has requested a volume driver uncertainty mechanism to facilitate cut-out replacements driven by consumer uptake of LCTs, with an ex-ante allowance based on its forecast.

3.122 NIE Networks also indicated that the volume of condition-based cut-out replacements it undertakes would need to be increased as part of the smart meter roll-out considerations. It stated that current manual meter reading allows for inspection of cut-outs on a quarterly basis, enabling the cut-out condition to be closely monitored and delivery of a prioritised replacement programme. With the advent of smart metering and automatic meter reading, cut-outs will not be subject to as frequent inspection.

Draft determination

3.123 We queried[28] NIE Networks' proposal to split the existing cut-out replacement programme into two new programmes with revised unit rates. In its submission NIE Networks stated that it had experienced a 60:40 split in RP6, simple versus complex, and this informed its RP7 proposals. The response stated that the additional volume of complex job types had been dealt with under fault repairs rather than under the cut-out replacement programme, and therefore had not been adequately reflected in the outturn unit rate. It went on further to state that its RP7 strategy is to increase the number replaced under the planned programme and reduce faults, and as result it revised down its fault cost projections.

3.124 Also, in query[29] response, NIE Networks provided its methodology for the proposed unit rates. The complex/three-phase proposal was based on a range of tasks that may be encountered in addition to simple job type tasks. This range and mix of tasks built up the costs for nine further job types, as detailed in Table 3.18, and a forecast blend of these was used to inform the proposed unit rate for the complex/three-phase programme. It was noted that NIE Networks had proposed upgrading the service to three-phase for certain complex single-phase job types where fuller excavations were required.

Job Code	Additional Tasks Required	Upgrade to three-phase	Forecast Cost (£)
C1	Excavate and reinstate concrete meter cupboard floor to achieve additional length on the service cable.	No	490
C2	Dismantle and rebuild meter cupboard	No	609
C5	As per C2 plus excavate and reinstate service joint bay in private property.	No	1,138
C3+	Excavate and reinstate cable trench in private property and joint bay in public.	Yes	1,239
C4+	As per C3+ plus dismantle and rebuild meter cupboard.	Yes	1,590
C6+	As per C4+ plus install 100mm duct up to 3m into property.	Yes	2,044
3C3	Replace three-phase cut-out. Excavate and reinstate service joint bay in private property.	N/A	796
3C4	As per 3C3 plus dismantle and rebuild meter cupboard.	N/A	1,147
3C6	As per 3C4 plus install 100mm duct up to 3m into property.	N/A	1,674

Table 3.18: Proposed complex/three-phase cut-out replacement job types

3.125 We did not accepted the approach of splitting the existing cut-out replacement sub-programme to separate simple and complex/three-phase

[28] UR-0091
[29] UR-0091

sub-programmes. Whilst we accept there may be a variation in tasks required when completing a cut-out replacement, which will affect outturn costs, we do not believe it to be good regulatory practice to introduce different unit rates to cater to the variation. We stated in RP6 that rates revealed in one price control should be the basis for the determined rates in subsequent price controls, with the 50:50 cost sharing mechanism providing relief for the company and protection for consumers until the next price control, should the determined rate not be efficient or there are material changes.

3.126 We also do not consider it appropriate for costs to upgrade single-phase services to three-phase should form part of the consideration for allowances at this stage. Increases to customer connection capacity may be included within our consideration of the current connection charging methodology review[30].

3.127 The existing cut-outs replacement programme is now well established, with over 10 years of outturn data available, which will be reflective of a wide variety of cut-out replacements, unless there has been a conscious deferral of more complex works. As Figure 3.1 below shows, the cumulative average unit cost has stabilised within a +/-5% range since 2016, on a cumulative total of 18,866 cut-out replacements, whilst there has been greater variation in the annual average unit cost, which may be representative of the variation of tasks encountered within that year.

[30] https://www.uregni.gov.uk/consultations/call-evidence-electricity-connection-policy-framework-review

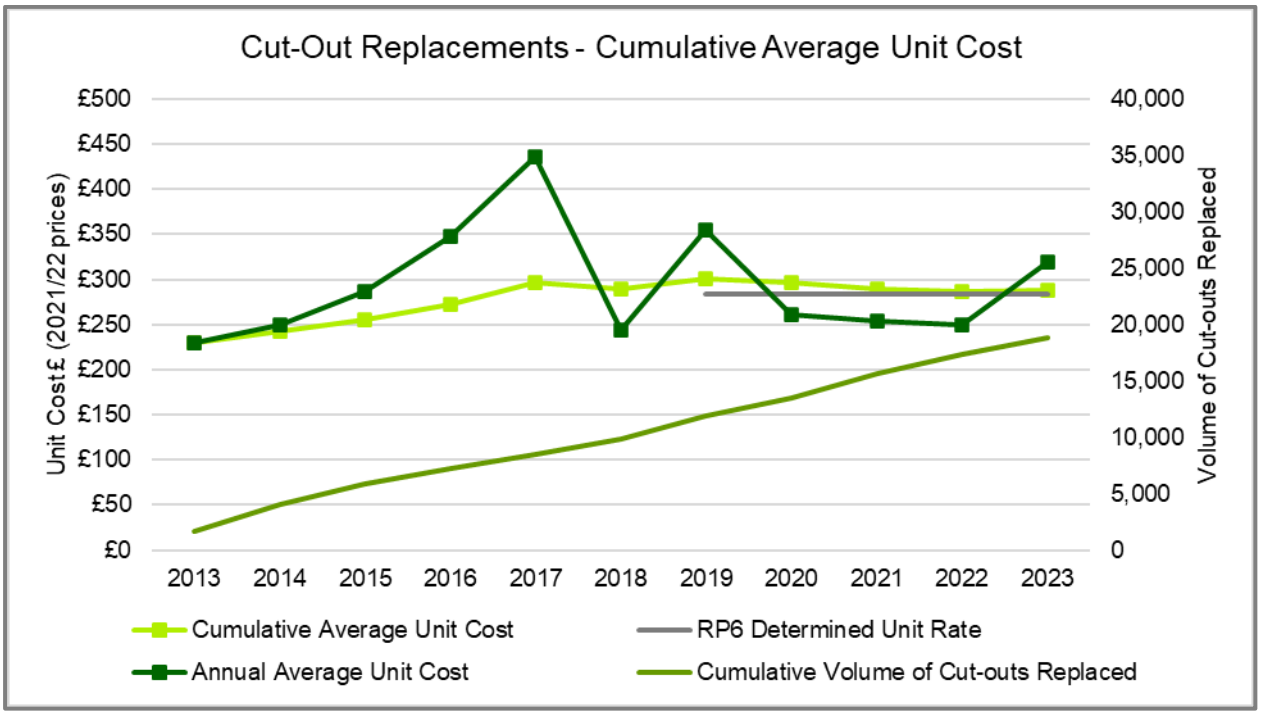


Figure 3.1: Outturn cumulative and annual average unit cost from 2013 to 2023

3.128 For RP6 we set the allowed unit rate at £282.73, which was the RP5 outturn to that stage. NIE Networks argued then that it had undertaken a 98:2 simple versus complex split in RP5 and that determining based on the RP5 outturn wasn't suitable for its forecast 90:10 split in RP6. The RP6 outturn to March 2023 is £288.42, 1.7% above the determined allowance. We believe this indicates our RP6 approach was appropriate and should be maintained going forward. We have therefore set our draft determination unit cost at the RP6 outturn to March 2023.

3.129 We have accepted the condition driven volume proposed for all cut-out replacements. There a substantial increase in this works type over RP6 which has been justified as follows:

- three phase cut-out replacements have not been addressed under a planned programme previously.
- the number of faults attributed to defective cut-outs has continued to increase, indicating the current overall replacement run rates need to increase.

3.130 It is preferential to replace cut-outs proactively rather than reactively under fault conditions and NIE Networks reduced its projected costs for related fault works by £1.566m.

3.131 We have accepted the proposed volume driver uncertainty mechanism to facilitate additional cut-out replacements driven by consumer uptake of

LCTs, and volumes will not be capped. Replacements of this type are reactive which will ensure that expenditure is only incurred when necessary.

3.132 We are establishing a separate cut-out replacement programme to capture LCT driven replacements (D11c), distinct from the condition-based replacements. This will simplify analysis and adjustment during annual tariff determinations. The unit cost for both programmes will be the same, and we will account for total volumes and outturn costs across both programmes for the purposes of the cost risk sharing mechanism and informing any future unit rate determinations.

Final determination

3.133 In its draft determination response NIE Networks provided further justification for a separate unit rate for 3-phase cut-out replacements. It detailed that setting an allowed unit cost for this new works type using the historic run-rate was not appropriate. In further engagement, in response to our queries, NIE Networks explained that the relatively low volume of 3-phase installations and encountered issues has meant targeted intervention has not been required to this point, but this approach needs to change due to observed age and condition related defects.

3.134 Following assessment of this response, we have accepted NIE Networks' proposal to create a separate 3-phase cut out replacement unit rate. In order to carry out 3-phase cut-out replacements safely it is required to isolate the service via excavations in all cases. This would incur higher costs than the single phase cut out replacement works and therefore we agree with NIE Networks that using the historic run-rate is not an appropriate basis for setting the 3-phase replacement allowance.

3.135 We have accepted the revised unit rate proposed for 3-phase cut-out replacement work that NIE Networks provided in its draft determination response. This new unit rate removed the complex single-phase cut-out replacement element from the unit rate build-up in the business plan submission, resulting in a 12% reduction. Our determination follows assessment of the build-up of this new rate which we have found to be reasonable.

3.136 NIE Networks also requested a volume driven category to separately report insufficiently rated 3-phase cut-outs replaced as result of customers installing LCTs. We have accepted this proposal which will provide the company flexibility and additional protection for consumers regardless of actual LCT uptake. The 3-phase unit rate will apply for this works category.

3.137 As indicated for the draft determination in Paragraph 3.132, the volume driven and condition-based programmes outturn, for each supply phase cut-

out type, will be assessed together for the purposes of the cost risk sharing mechanism and informing any future unit rate determinations.

3.138 NIE Networks provided detail, as shown in Table 3.19 below, on how the various cut-out replacement scenarios will be initiated and subsequently reported within the condition based or LCT uptake driven RP7 sub-programmes, depending on cut-out type. Facilitating loads more than 80A would require a change to the customers connection arrangement, therefore works to facilitate this scenario, including upgrading the cut-out, would be directly chargeable to the customer.

Scenario	Reporting Sub-programme
Poor condition/non-compliant single phase cut out identified and scheduled for replacement	D11a – Replace Service Cut-outs - Condition Based
Poor condition/non-compliant 3-phase cut out identified and scheduled for replacement	D11b Replace 3-Phase Service Cut-outs - Condition Based
LCT application to connect to a single phase cut out that is identified in poor condition/non-compliant/<80A Rating	D11c – Replace Service Cut-outs - Volume Driven
LCT application to connect to a 3-phase cut out that is identified in poor condition/non-compliant/<80A Rating	D11d – Replace 3-Phase Service Cut-outs - Volume Driven

Table 3.19: Service cut-outs replacement process and reporting

3.139 We agree with NIE Networks' proposals on what activities can be carried out under the allowed cut-out replacement programme and what sub-programmes the volumes and incurred costs should be reported to.

3.140 NIE Networks provided no comment on our draft determination unit rate that will apply for single phase cut out replacements and it has not been adjusted for the final determination. With the creation of new 3-phase categories the volumes allowed and forecast at the draft determination have been reallocated in line with NIE Networks' proposal. Our final determination for direct investment in cut-outs is provided in Table 3.20 below.

Sub-programme	UoM		Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D11a – Replace Service Cut-outs - Condition Based	Each	NIE Networks' Proposal	9,874	0.2	1,748
		Draft Determination	15,000	0.3	4,326
		Final Determination	14,100	0.3	4,067
D11b Replace 3-Phase Service Cut-outs - Condition Based	Each	NIE Networks' Proposal	6,582	1.2	7,839
		Draft Determination	0	Disallowed	0.000
		Final Determination	900	1.1	945
D11c – Replace Service Cut-outs - Volume Driven	Each	NIE Networks' Proposal	1,456	0.6	849
		Draft Determination	1,456	0.3	420
		Final Determination	1,369	0.3	395
D11d – Replace 3-Phase Service Cut-outs - Volume Driven	Each	NIE Networks' Proposal	N/A	N/A	N/A
		Draft Determination	N/A	N/A	N/A
		Final Determination	87	1.1	91
D11: Service Cut-Outs Total		NIE Networks' Proposal			10,436
		Draft Determination			4,746
		Final Determination			5,498

Note 1. Figures may not sum due to rounding.

Table 3.20: D11: Service cut-outs final determination

3.141 As indicated in the draft determination, we will assess what is appropriate for cut-out replacements because of smart metering as part of considerations for that project, outside of the RP7 price control process.

D13: Primary plant

3.142 See GHD report in Annex R

D13: Primary Plant Final Determination	NIE Networks' Proposal	29,903
	Draft Determination	27,211
	Final Determination	29,223

Table 3.21: D13 Primary plant final determination

D14: 33/11kV transformers

3.143 See GHD report in Annex R

D14: 33/11kV Transformers Final Determination	NIE Networks' proposal	16,088
	Draft Determination	14,136
	Final Determination	15,476

Table 3.22: D14 33/11kV transformers final determination

D15: Secondary plant

3.144 See GHD report in Annex R

D15: Secondary Plant Final Determination	NIE Networks' Proposal	53,080
	Draft Determination	45,998
	Final Determination	47,240

Table 3.23: D15 Secondary plant final determination

D16: Distribution underground cables

Scope of work

3.145 NIE Networks has an extensive underground (UG) cable network which is predominantly situated in urban areas where, for safety or aesthetic reasons, it is difficult to build overhead lines. The distribution network consists of approximately 1,100km of 33kV, 4,100 km of HV (6.6kV and 11kV) and 11,000km of LV UG cables.

3.146 There are many different types of cable in use on NIE Networks' system. The various types of cable reflect the different standards and manufacturing techniques available at the time of purchase hence the oldest cables utilise vulcanised bitumen (VB) or oil impregnated paper as an insulation medium whilst the newest cables will use cross linked polyethylene (XLPE) or poly vinyl chloride (PVC).

3.147 CONSAC is a type of LV cable that was utilised by almost all UK DNOs during the late 1970s and early 1980s. Due to the design of the cable, it

performed very poorly and is the cause of numerous faults. The cable is now considered not fit for purpose and is being systematically replaced by all DNOs who installed it.

3.148 The 33kV UG system uses fluid filled cables (FFC), which were installed between the 1940s and the 1970s. They are some of the most reliable and long-lasting electricity network assets; however, they require additional equipment to supply and pressurise the fluid running through the cables. The additional equipment, as well as the cables, necessitate fluid prevention maintenance and strategies, as leaked fluid can be harmful to the environment.

3.149 During RP6 NIE Networks executed the following activities on the UG distribution network:

a) D16i replace HV cable - replace cables or cable sections which have been identified as poor performing or of deteriorated condition.

b) D16j replace LV cable - replace cables or cable sections which have been identified as poor performing or of deteriorated condition.

c) D16l refurbish 33kV FFC - refurbish the worst performing circuits with highest leak rates.

d) D16m part replacement of 33kV paper insulated lead covered (PILC) cable - replace cables or cable sections which have been identified as poor performing or of deteriorated condition.

e) D16n procure leak management technologies - tagging FFC circuits with tracer fluid that aids rapid leak detection and repair.

f) D16o distribution cable accessories/ancillaries - refurbish or replace 33kV circuit equipment such as cable boxes and terminations, and FFC hydraulic systems such as tanks and pumps.

g) D16p procure condition monitoring equipment - procure more advanced condition monitoring equipment that could be used without cable outages.

NIE Networks' RP7 proposal

3.150 NIE Networks' UG distribution cable RP7 proposals include the continuation of all of the RP6 programmes apart from D16p procure condition monitoring equipment. It has also proposed the addition of the following two new programmes:

a) D16h part replacement of 33kV FFC - replace sections of poor performing FFC near watercourses that have the highest risk of environmental danger from leakages.

b) D16s decommission FFC - additional works to remove the environmental hazard of oil leaking from a FFC no longer in service.

3.151 NIE Networks has set out its plans for investment in UG distribution cables in EJPs 1.601 to 1.604 of its RP7 Network Investment Programme suite of documents. These plans are summarised in Table 3.24 below.

Sub-programme	UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D16h - Part replacement of 33kV FFC	m	3,114	0.3	945
D16i - Replace HV Cable	m	18,000	0.1	1,642
D16j - Replace LV cable	m	78,000	0.1	12,092
D16l - Refurbish 33kV FFC	Circuit	9	37.6	338
D16m - Part replacement of 33kV PILC Cable	m	15,533	0.3	4,711
D16n - Procure leak management technologies	LS	N/A	N/A	1,564
D16o - Distribution cable accessories/ancillaries	LS	N/A	N/A	346
D16s - Decommission FFC	LS	N/A	N/A	50
D16: Distribution Underground Cables Total				21,688

Note 1. Figures may not sum due to rounding.

Table 3.24: NIE Networks' D16: Distribution underground cables proposal

3.152 NIE Networks' total RP7 UG cable investment proposals are a large increase over RP6, going from an annual average allowance of £1.2m to £3.6m, a 182% increase. This increase is largely driven by the increased volume of LV and 33kV PILC cable replacement activity, as NIE Networks states existing activity levels are not offsetting the rate of deterioration and faults.

Draft determination

3.153 Replacement of HV cables is an ongoing task due to the age and condition of the existing assets. We accepted the volumes proposed by NIE Networks as they are similar to the RP6 run rates.

3.154 Replacement of LV cables is an ongoing task due to the age and condition of the existing assets. NIE Networks' RP7 proposals are significant increase over the RP6 run rate, going from an annual average of 4.2km to 13km. It has submitted condition assessment and fault data for its LV UG network, which has highted that the existing run rates are not adequate, particularly for CONSAC cable. NIE Networks has also started installing monitoring

equipment that can help it better target the worst performing circuits. We therefore accepted the volumes proposed.

3.155 We did not accept the proposed unit costs for the LV and HV UG cable replacement programmes. In particular the uplift for an increase in excavation and reinstatement costs, that we do not consider to be outside the scope of frontier shift adjustments. As a result, we adjusted the unit costs for both programmes to the RP6 outturn to March 2023.

3.156 Replacement of 33kV PILC cables is an ongoing task due to the age and condition of the existing assets. NIE Networks' RP7 proposals are significant increase over the RP6 run rate, going from an annual average of 0.49km to 2.59km.

3.157 Its RP7 strategy is to target 33kV PILC circuits which have unacceptably high failure rates, which it has defined as greater than three deterioration-related faults in the previous three years or greater than two faults in a year. The circuit details and fault history are provided in Table 3.25 below. Each cable provides a supply to either one or two primary substation transformers, resulting in system risk until the fault has been located and repaired which can take several days to complete.

33kV PILC Circuit	Year Installed	Faults
Carnmoney Main to Glengormley Main	1964	2021 (x2), 2023
Carnmoney Main to Monkstown S/D	1964	2014, 2020, 2021
Dunmore S/D to Fortwilliam S/D	1958	2017, 2020
Dunmore S/D to Carrs Glen Tx. C	1951	2014, 2017, 2018, 2019, 2021 (x2)
Finaghy Main (FM23) to Pole (K) 250	1962	2021, 2022
Finaghy Main (FM24) to Tower 501	1962	2014, 2018, 2019, 2020, 2021, 2022
Finaghy Main (FM28) to Tower 501	1962	2012 (x2), 2013, 2015, 2021

Table 3.25: Worst performing 33kV PILC circuits

3.158 We noted that NIE Networks choose to substitute allowances for this programme to the HV UG cable replacement programme during RP6. However, given the fault trends with these circuits, and their importance to the system, we accepted the volumes proposed.

3.159 NIE Networks set its proposed unit cost for the replacement of 33kV PILC cables at the RP6 outturn to March 2022, and we have therefore accepted its proposal.

3.160 We accepted the 33kV FFC refurbishment and new 33kV FFC replacement programmes. These programmes are aimed at refurbishing or replacing those circuits identified as worst performing and providing highest

environmental risk. NIE Networks has legal obligations to adequately control inadvertent discharges, and recurrence of a polluting offence may be prosecuted. Given the history and location of the circuits to be addressed, we accepted the proposals.

3.161 For the new 33kV FFC replacement programme, NIE Networks' proposed unit cost is the same as the 33kV PILC cable replacement programme, and we have therefore accepted the company's proposal.

3.162 For the refurbishment of 33kV FFC programme, NIE Networks set its proposed unit cost at the RP6 outturn to March 2022, with an uplift to due excavation and reinstatement and material cost increases. We did not consider these uplifts to be outside the scope of our frontier shift adjustments and were minded not to include them. However, we received further data for the 2023 reporting year and added it to the RP6 average calculation. We found NIE Networks' proposal is now below the RP6 outturn rate to March 2023, and we therefore accepted its proposal.

3.163 NIE Networks proposed a ten-fold increase in expenditure for the leak management technologies programme in comparison to RP6. The increase is driven by a change in strategy from tagging just the circuits with highest leakage, to tagging all circuits. This strategy will ensure all current and future leaks can be addressed more promptly, and identified more cost effectively than conventional methods, and we agree with these proposals. With all circuits addressed this programme would not be required for RP8, however there are developments for self-healing fluids in other networks that may require consideration.

3.164 We queried[31] the build-up of costs for this lump sum programme and the number of circuits it had had addressed to date in RP6. NIE Networks detailed that it based costs on the number of oil sections, rather than circuits. It had addressed 11 oil sections in RP6 and was proposing 60 for RP7. It added £6k per section for 14 RP7 oil sections that could only be addressed in publicly accessible areas, necessitating mobile generation for the pumps and 24-hour security for what could be a week-long process.

3.165 In our analysis for the draft determination, we removed the total additional costs of £84k for mobile generation and security from the RP7 proposal to compare costs on a per oil section basis. We found NIE Networks' proposal to be a 114% increase, going from c.£11.5k per oil section in RP6 to c.£24.7k in RP7. There was no justification for this increase, in fact NIE Networks stated it started carrying out this activity using in house resources during RP6 allowing efficiencies to be made.

[31] UR-0351, UR-0401

3.166 We set the allowance based on the proposed number of oil sections (60) multiplied by the RP6 outturn cost per section c.£11.5k and added the additional costs (£84k) for mobile generation and security.

3.167 We accepted the proposed lump sum for cable accessories and ancillaries. There is an ongoing requirement to refurbish and replace this equipment, and proposed expenditure is in line with the RP6 run rate.

3.168 We accepted the proposed lump sum for the decommissioning of a FFC including the additional works to remove the environmental hazard of oil leaking from it.

Final determination

3.169 In its draft determination response NIE Networks disagreed with our approach to setting the allowances for the replacement of HV cable and replacement of LV cable programmes. It argued that setting the allowances for these programmes using the available outturn data from RP6 and relying on the price control real price effect adjustments, would not reflect the cost increases it will experience.

3.170 It is our view that outturn costs for established programmes are a suitable basis for future allowances. We have utilised 5.5 years of outturn data for these programmes, which provides almost a full price control period sample and will reflect a mix of factors that influence costs such as reinstatement types, traffic density, project size and complexity.

3.171 It is also our view that the allowed real price effect adjustments, whilst unlikely to precisely mirror cost changes on an individual programme level, provide an overall reflection of cost changes. For the final determination we have also proposed an RPE true-up mechanism, as further detailed in our frontier shift annex, which is intended to provide NIE Networks assurance in the event of significant future price volatility.

3.172 Given the above we have made no adjustment to the replacement of HV cable and replacement of LV cable programmes for the final determination.

3.173 NIE Networks provided no comment on our draft determination for the other UG distribution cables programmes, and no adjustment has been made to these for the final determination.

3.174 Our final determination for direct investment in UG distribution cables is set out in Table 3.26 below.

Sub-programme		UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D16h - Part replacement of 33kV FFC	NIE Networks' Proposal	m	3,114	0.3	945
	Draft Determination	m	3,114	0.3	945
	Final Determination	m	3,114	0.3	945
D16i - Replace HV Cable	NIE Networks' Proposal	m	18,000	0.1	1,642
	Draft Determination	m	18,000	0.1	1,573
	Final Determination	m	18,000	0.1	1,573
D16j - Replace LV cable	NIE Networks' Proposal	m	78,000	0.1	12,092
	Draft Determination	m	78,000	0.1	10,880
	Final Determination	m	78,000	0.1	10,880
D16l - Refurbish 33kV FFC	NIE Networks' Proposal	Circuit	9	37.6	338
	Draft Determination	Circuit	9	37.6	338
	Final Determination	Circuit	9	37.6	338
D16m - Part replacement of 33kV PILC Cable	NIE Networks' Proposal	m	15,533	0.3	4,711
	Draft Determination	m	15,533	0.3	4,711
	Final Determination	m	15,533	0.3	4,711
D16n - Procure leak management technologies	NIE Networks' Proposal	LS	N/A	N/A	1,564
	Draft Determination	LS	N/A	N/A	776
	Final Determination	LS	N/A	N/A	776
D16o - Distribution cable accessories/ancillaries	NIE Networks' Proposal	LS	N/A	N/A	346
	Draft Determination	LS	N/A	N/A	346
	Final Determination	LS	N/A	N/A	346
D16s - Decommission FFC	NIE Networks' Proposal	LS	N/A	N/A	50
	Draft Determination	LS	N/A	N/A	50
	Final Determination	LS	N/A	N/A	50
D16: Distribution Underground Cables Total	NIE Networks' Proposal				21,688
	Draft Determination				19,620
	Final Determination				19,620

Note 1. Figures may not sum due to rounding.

Table 3.26: D16: Distribution underground cables final determination

D39: SCADA

3.175 See GHD report in Annex R

D39: SCADA Final Determination	NIE Networks' proposal	4,803
	Draft Determination	4,377
	Final Determination	4,420

Table 3.27: D39 SCADA final determination

D41: Operational telecoms

3.176 See GHD report in Annex R

D41: Operational Telecoms Final Determination	NIE Networks' Proposal	13,956
	Draft Determination	13,505
	Final Determination	13,956

Table 3.28: D41 Operational telecoms final determination

D43: ESQCR

Scope of work

3.177 The Electricity Safety, Quality and Continuity Regulations came into force in Northern Ireland in 2012 and required NIE Networks to carry out certain tasks to ensure its network met the new standards.

3.178 In RP5 NIE Networks began scoping out the necessary tasks and began an implementation programme in RP6.

3.179 A number of very high/high risk sites were identified in RP6, and these were expected to be complete within the price control.

3.180 Due to the number of ground clearance issues on the LV system we amalgamated the ESQCR and LV overhead line refurbishment programme, this provided more efficient work scheduling and reporting.

3.181 The regulations stipulated certain conditions relating to the use of flammable insulating mediums in enclosed spaces and substations within office and residential buildings. Hence transformers in these locations are required to have their insulating oil replaced with a non-flammable, ester-based fluid.

3.182 During the 60s, 70s and 80s many houses were serviced from underground cables and, to save money, two houses were serviced from a single cable which fed one property and then looped to the second. As domestic load has steadily increased, this method is now considered inappropriate. The solution is to install a second service cable and remove the loop between

properties. This is an ongoing work programme which has delivered relatively modest volumes during RP6.

3.183 Tree cutting is an ongoing, business as usual, work item during any price control and is carried out in accordance with the Energy Networks Association (ENA) technical specification 43-8 which stipulates clearance distances of tree limbs from live conductors.

3.184 The ENA developed its Engineering Technical Report, ETR132 to give guidance on a risk-based approach to vegetation management to improve network resilience under abnormal weather conditions. This involves calculating the risk of network contact for any given tree and whether the tree can be left untouched, trimmed or felled.

3.185 During RP5, NIE Networks completed the resilience cut on the 33kV system and, in RP6 began the resilience cut on the 11kV system.

3.186 Retro-filling of primary transformers with a flame retardant, ester based fluid is a new sub-programme for RP7. It is similar to D43g with the difference being the transformers to be filled are 33/11kV power transformers which are much bigger and require larger volumes of insulating fluid. Only transformers in high-risk areas are considered. These high-risk areas include transformers in densely populated areas and/or surrounded by populated buildings.

NIE Networks' RP7 proposal

3.187 NIE Networks has identified a further tranche of very high/high risk sites to be completed during RP7. The majority of the sites are located along riverbanks used by anglers where mitigation is required against accidental contact between live conductors and fishing rods/poles. The extensive use of conductive carbon fibre in the manufacture of modern fishing equipment exacerbates the risk of contact. NIE Networks is proposing expenditure of £7.3m to mitigate this issue and a further £1.2m for new sites identified where a change of land use has occurred e.g. from a field to a football pitch.

3.188 It is proposed to ramp up the output volume for LV overhead line refurbishment from ~130km per annum in RP6 to 675km per annum in RP7. NIE Networks has also informed us that, due to large increases in its contractor costs the unit rate for LV overhead line refurbishment has increased from current average outturn of £23.7k/km to £31.6k/km. The ramping up of the programme is necessary to bring 100% of the LV network in compliance with ESQCR within a 15-year timeframe. NIE Networks also included in the LV Refurbishment programme several houses fed via undereaves mains.

3.189 Distribution transformer insulating medium refill is a continuation of the sub-programme started in RP6 and is basically a "mop up" of the units not identified in the RP6 Price Control.

3.190 Resolution of looped services is also a continuation of the business-as-usual works which began in RP6. Due to the implications of LCT connecting to a looped service, NIE Networks is proposing to increase the volume during RP7.

3.191 The 11kV resilience cut was started in RP6 and is another business-as-usual sub-programme. NIE Networks is proposing to increase the volume during RP7.

3.192 Primary transformer retro-fill is new sub-programme proposed for RP7 and involves replacing the insulating medium in 8 x 33/11kV transformers situated in high-risk areas with respect to damage in the event of a fire in the transformer. The volume of oil to be replaced in these transformers is around 10 times the volume required for a distribution transformer.

Sub-programme	EJP	UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D43c: Address very high-risk sites	1.201	prog	N/A	N/A	8,462
D43d: LV clearances and OH refurbishment	1.508	km	4,047	29.5	119,5006
D43g: Distribution transformers	1.201	Ea	60	5.4	323
D43h: Resolve looped services	1.201	Ea	2,589	1.1	2,944
D43i: 11kV Resilience cut	1.201	km	1,570	1.7	2,710
D43s: Primary transformers retro-fill	1.201	Ea	8	31.6	253
D43 Total					134,190

Table 3.29: NIE Networks' ESQCR proposal

Draft determination

D43c: ESQCR - Address very high-risk sites

3.193 We had expected NIE Networks to complete all high-risk sites in the RP7 proposal and raised query UR-0051 to seek an explanation of the additional sites required in RP7. In its response, NIE Networks explained that the re-purposing of land can create new high-risk sites and this is unavoidable. We accept this explanation and should expect further instances of this in future price controls.

3.194 NIE Networks also explained about its policy decision to classify all fishing sites as very high risk and requiring mitigation during RP7.

3.195 We looked at the outturn expenditure for RP6 to date and found that NIE Networks are currently spending around £3m per annum against an allowance that covers £3.4m per annum. This represents a 7% underspend and is an efficiency saving. We will, therefore, apply the same percentage saving to the proposed RP7 amount.

D43d: ESQCR - LV overhead refurbishment and address clearance issues

3.196 We are aware that NIE Networks included 8,000 undereaves fed properties in its RP7 proposal. We do not agree with this methodology, and we disallowed this expenditure in the D43d category. However, we increased the volumes and allowances in the D10 category to compensate. The reason for the movement of volumes from one category to another is to keep all similar works reported under the same category. This way we can monitor costs and output effectively. We will, therefore, disallow 8000 properties @ £627/property = £5,016,000. As the average width per property is 5m we will also reduce volumes by 3km

3.197 NIE Networks has proposed an ambitious plan to increase delivery of LV overhead line refurbishment volume during RP7. The graph shown in Figure 3.2 shows output (outturn and forecast) during RP6 and the subsequent increase during RP7.

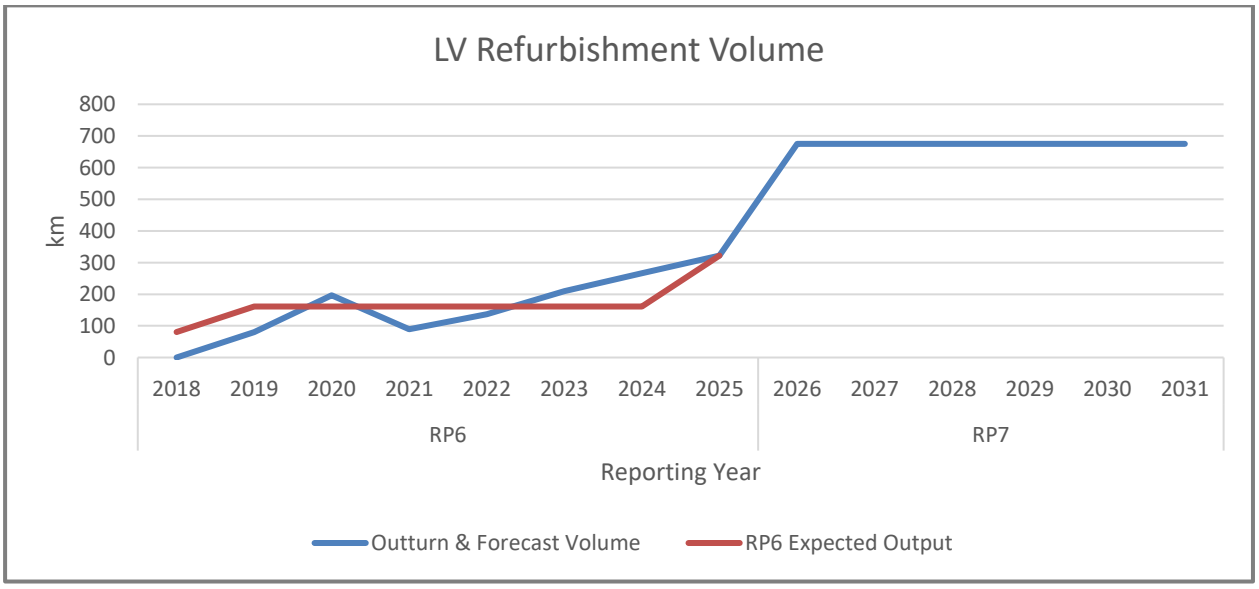


Figure 3.2: Outturn and forecast delivery volumes

3.198 As well as making the LV network ESQCR compliant with respect to ground clearances this sub-programme will also provide additional capacity through upgrading low capacity conductors.

3.199 Based on historic outturn volumes being below those expected, we have concerns that NIE Networks will be unable to increase output to its proposed RP7 volumes. However, given the upturn in output since 2021 we are willing to allow the RP7 proposed volumes (less the deduction detailed in Paragraph 3.196) in the knowledge that the deferral mechanism will deal with any under-delivery in RP7.

3.200 The historic outturn unit cost/km is shown in Figure 3.3.

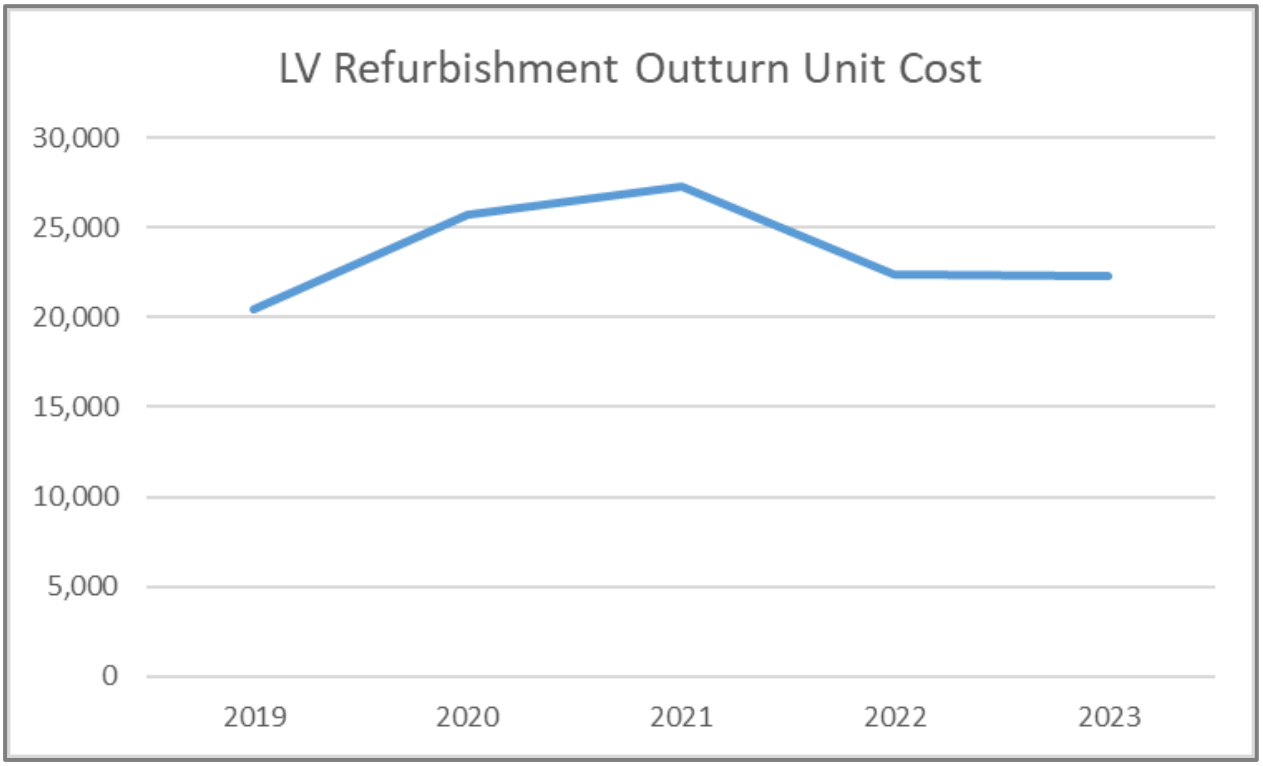


Figure 3.3: Outturn unit cost

3.201 We are aware of increased contractor costs negotiated by NIE Networks in the second half of 2022. However, due to reporting lag we have seen no evidence of the increased costs yet.

3.202 As with other overhead related sub-programmes we were minded to allow an addition of 39% to the contractor driven element of the costs. However, we noted that we would review this prior to the publication of our final determination in 2024.

D43g: ESQCR - Distribution transformers

3.203 We found the RP6 outturn unit costs to be very similar to the proposed RP7 unit costs. We had no issue with the volume proposed for RP7 and accept NIE Networks' explanation that any new transformers installed in enclosed spaces will be filled with non-flammable insulation medium at the time of installation. Therefore, the end of RP7 this should represent the close of this sub-programme.

D43h: ESQCR - Resolve looped services

3.204 Current RP6 outturn volume is averaging at 145 per annum and this is proposed to increase to 432 per annum.

3.205 Whilst NIE Networks has proposed a unit cost which is 16% below that of the RP6 determination, our analysis shows current outturn unit cost is around 50% of the RP6 allowance.

3.206 We are content to allow the increased volumes in the knowledge that the deferral mechanism will take care of any undelivered volumes, however we require a reduction in the unit cost in line with current delivery costs.

3.207 In addition to the above, we have introduced a volume driven re-opener to be used in the event that LCT uptake dictates the acceleration of the looped service sub-programme. The reopener cannot be instaigated sooner than April 2029 and only if the delivery of all ex-ante outputs has been achieved.

D43i: ESQCR - 11kV resilience cut

3.208 As with some of the sub-programmes mentioned above, NIE Networks proposed a significant increase in volumes for RP7.

3.209 Current RP6 outturn delivery is significantly delayed with only 30% volume delivered with 73% of the price control period elapsed.

3.210 Notwithstanding the above point, we are content to allow the increased volumes in the knowledge that the deferral mechanism will take care of any undelivered volume.

3.211 Current outturn unit cost is above that proposed by NIE Networks; hence we accept that efficiencies can be found by the company in RP7 and accept the proposed costs.

D43s: ESQCR - Primary transformer retro-fill

3.212 This is a new sub-programme proposed for RP7 therefore we had no outturn data on which to base or determination.

3.213 We raised query UR-0412 to gain further information regarding the cost breakdown for this task.

3.214 In its response, NIE explained that the volume of insulating fluid required for a primary transformer is almost 10 times that of a distribution transformer. However, due to economies of scale the cost is only 7 times more expensive. Labour costs are 4 times more expensive due to the longer time to pump and filter the larger volume of fluid and bought in services are around twice as expensive.

3.215 We accepted NIE Networks explanation of costs and allow the proposed costs and volumes in full.

Sub-programme	UoM		Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D43c: Address very high risk sites	LS	NIE Networks' Proposal	N/A	N/A	8,462
	LS	Draft Determination	N/A	N/A	7,870
D43d: LV clearances and OH refurbishment	km	NIE Networks' Proposal	4,050	31.6	128,116
	km	Draft Determination	4,047	30.6	123,940
D43g: Distribution transformers	Ea	NIE Networks' Proposal	60	5.4	323
	Ea	Draft Determination	60	5.4	323
D43h: Resolve looped services	Ea	NIE Networks' Proposal	2,589	1.9	4,885
	Ea	Draft Determination	2,589	1.1	2,944
D43i: 11kV Resilience cut	km	NIE Networks' Proposal	1,570	1.7	2,710
	km	Draft Determination	1,570	1.7	2,710
D43s: Primary transformers retro-fill	Ea	NIE Networks' Proposal	8	31.6	253
	Ea	Draft Determination	8	31.6	253
D43	NIE Networks' Proposal				144,748
	Draft Determination				138,039
	Total Change +/-				-6,710
	Total Change %				-5%

Table 3.30: D43 draft determination

Final determination

D43c: ESQCR - Address very high-risk sites

3.216 In its response to our draft determination, NIE Networks disagreed with our assessment of "Address Very High-Risk Sites". It stated that we had not taken account of the outstanding works still to be completed before 2025 and only looked at current outturn compared against a flat profile of works over the price control period. In its original submission, the company stated "In RP6 the level of risk was to be removed at all previously identified very high-risk' sites. This is on target to be largely complete by the end of the RP6

extension year". Our draft determination reflected the low level of information provided.

3.217 The company provided a more detailed breakdown of its projected expenditure in its response to our draft determination. The new information shows that the company expects to overspend its RP6 allowance and that many projects are back-ended due to access issues at schools and caravan parks and delays caused by planning permission applications.

3.218 The RP6 allowances are categorised as "Programme" amounts meaning that all outputs are to be delivered within the price control period. We also requested a specific report showing progress against all identified sites. The report will be required by the end of RP6 so that we can identify any projects that are deferred into RP7 and ensure they are completed without additional funding.

3.219 Given the additional information provided, we are content to reverse the reduction applied in the draft determination.

D43d: ESQCR - LV clearances and OH refurbishment

3.220 In its response to our draft determination, NIE Networks stated that we had not taken full account of its contractor cost increases. We were aware of the cost increases prior to the publication of the draft determination, and we made a commitment to review the data prior to publication of this final determination.

3.221 The RIGs data submitted by the company in July 2024 (Figure 3.4 below) indicated an upturn in costs for 2023/24 delivery but not to the extent requested by the company in its business plan submission. Therefore, we will use the last year of data to determine our RP7 allowances.

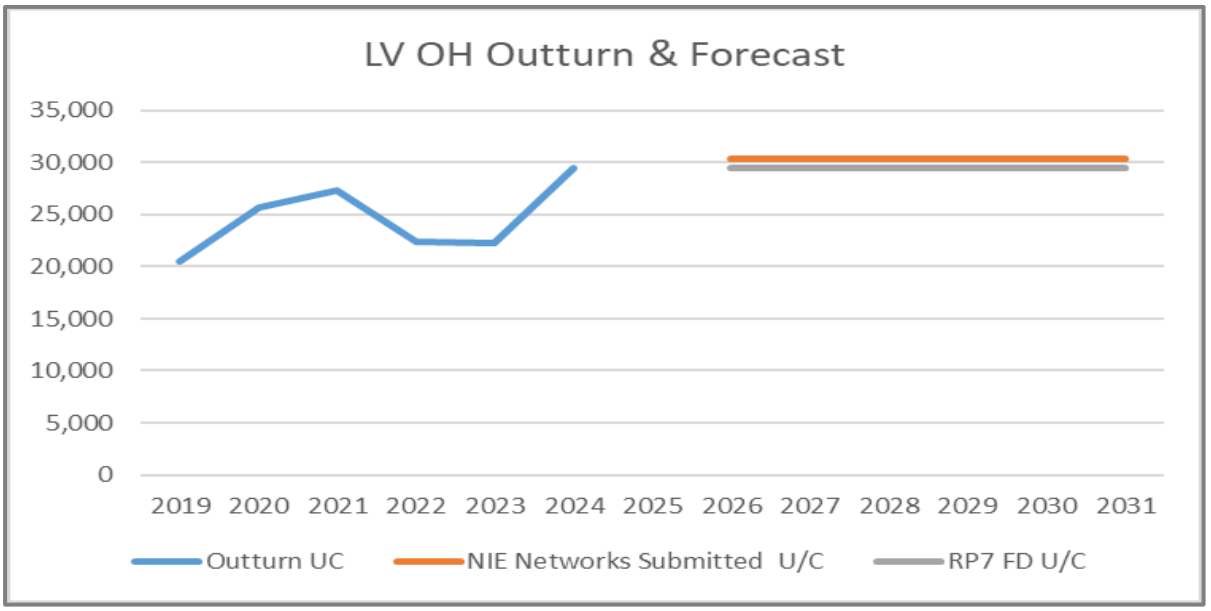


Figure 3.4: D43d outturn and forecast data

D43h: ESQCR - Resolve looped services

3.222 Although we are making no changes to the ex-ante allowances set out in the draft determination, we have introduced a volume driven re-opener to provide a mechanism for the company to deliver more outputs in the event that LCT uptake is greater than expected. The re-opener will only be used if the company have fully delivered the forecast volume of 2,589 prior to the close of RP7.

3.223 NIE Networks did not comment on our draft determination for all other sub-programmes in this category, and no further adjustments have been made to these for the final determination.

Sub-programme	UoM		Volume	Unit Cost (£k)	Allowance (£k)
D43c: Address very high-risk sites	LS	NIE Networks' Proposal	N/A	N/A	8,462
	LS	Draft Determination	N/A	N/A	7,870
	Prog	Final Determination	N/A	N/A	8,462
D43d: LV clearances and OH refurbishment	km	NIE Networks' Proposal	4,050	31.633	128,116
	km	Draft Determination	4,047	30.602	123,848
	km	Final Determination	4,047	29.528	119,500
D43g: Distribution transformers	Ea	NIE Networks' Proposal	60	5.379	3223
	Ea	Draft Determination	60	5.379	323
	Ea	Final Determination	60	5.379	323
D43h: Resolve looped services	Ea	NIE Networks' Proposal	2,589	1.887	4,885
	Ea	Draft Determination	2,589	1.137	2,944
	Ea	Final Determination	2,589	1.137	2,944
D43i: 11kV Resilience cut	km	NIE Networks' Proposal	1,570	1.726	2,710
	km	Draft Determination	1,570	1.726	2,710
	km	Final Determination	1,570	1.726	2,710
D43s: Primary transformers retro-fill	Ea	NIE Networks' Proposal	8	31.572	253
	Ea	Draft Determination	8	31.572	253
	Ea	Final Determination	8	31.572	253
D43 ESQCR	NIE Networks' Proposal				144,748
	Draft Determination				137,947
	Final Determination				134,190

Note 1. Figures may not sum due to rounding.

Table 3.31: D43 final determination

D50: Climate change resilience

Scope of work

3.224 Ingress of flood water at substation locations can cause major disruption as switchgear and protection equipment are unable to operate when water damaged.

3.225 NIE Networks has undertaken flood mitigation works at keys sites since RP5. The intervention methods vary from site to site and range from installation of demountable flood defences to physically raising the substation equipment above the expected flood levels.

NIE Networks' RP7 proposal

3.226 In RP5, NIE Networks began a programme of protecting larger substations in high flood risk zones. Then, in RP6, several primary and secondary sites were protected.

3.227 The RP7 proposal is a continuation of the RP6 programme with a further 5 primary substations and 40 secondary sites identified for flood protection.

3.228 A third strand of investment is also proposed for RP7, and this involves treating substations affected by high water table. The company has identified 11 sites where high water table causes ingress of water into the lower levels of the substations causing cable faults, accelerated deterioration of steelwork and unhealthy, high humidity conditions.

Sub-programme	EJP	UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D50a: Permanent protection of primary substations	1.804	Site	5	1114	557
D50b: RMU flood protection	1.804	Site	40	104	416
D50c: High water table remediation	1.804	Site	11	37.0	407
D50 Total					1,380

Table 3.32: NIE Networks' flood mitigation proposal

Draft determination

D50a: Permanent protection of primary substations

3.229 During RP6 the company has delivered 5 of the programmed 9 sites to date. The outturn costs have averaged around £144k/site which is higher than the forecast cost proposed in the RP6 business plan.

3.230 At the draft determination, we were minded to accept NIE Networks' RP7 proposal for primary and secondary sites with the caveat that we will continue dialogue with the company prior to the final determination to explore deferral of some of the works to a later price control.

3.231 The high water table remediation sub-programme is a new strand of work and we had no outturn data on which to inform our decision. However, the value of the works is sufficiently low to present a low risk to consumers. Therefore, we accept the RP7 proposal and will monitor outturn costs during the price control.

Sub-programme	UoM		Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D50a: Permanent protection of primary substations	Site	NIE Networks' Proposal	5	1114	557
	Site	Draft Determination	5	1114	557
D50b: RMU flood protection	Site	NIE Networks' Proposal	40	104	416
	Site	Draft Determination	40	104	416
D50c: High water table remediation	Site	NIE Networks' Proposal	11	37.0	407
	Site	Draft Determination	11	37.0	407
D50	NIE Networks' Proposal				1,380
	Draft Determination				1,380
	Total Change +/-				0
	Total Change %				0%

Table 3.33: D50 draft determination

D50 final determination

3.232 During the draft determination query process, we outlined our concerns to NIE Networks that some of the flood mitigation works are modelled on 2080 forecast data and we were interested in deferring some of these works to a later price control given the validity of the forecast data.

3.233 NIE Networks provided present day flood analysis which showed that the substations proposed for mitigation works were already at risk and that the 2080 forecast data showed the risk to be exacerbated. We agreed with the new data and find that the caveat applied in the draft determination has been addressed.

3.234 NIE Networks did not comment on our draft determination for all other sub-programmes in this category, and no further adjustments have been made to these for the final determination.

Sub-programme	UoM		Volume	Unit Cost (£k)	Allowance (£k)
D50a: Permanent protection of primary substations	Site	NIE Networks' Proposal	5	111.4	556
	Site	Draft Determination	5	111.4	556
	Site	Final Determination	5	111.4	557
D50b: RMU flood protection	Site	NIE Networks' Proposal	40	10.4	416
	Site	Draft Determination	40	10.4	416
	Site	Final Determination	40	10.4	416
D50c: High water table remediation	Site	NIE Networks' Proposal	11	37.0	407
	Site	Draft Determination	11	37.0	407
	Site	Final Determination	11	37.0	407
D50 Flood Mitigation	NIE Networks' Proposal				1,380
	Draft Determination				1,380
	Final Determination				1,380

Note 1. Figures may not sum due to rounding.

Table 3.34: D50 final determination

D57m: High impact low probability events

Scope of work

3.235 Distribution System Security and Planning Standards in Northern Ireland require a certain amount of redundancy to negate customer outages in the event of a fault. This is classified as "N-1" which means a duplicate asset, such as a transformer or incoming feeder is present and can supply the connected load if a fault occurs on the primary asset.

3.236 With the uptake in LCT and added dependency on the electricity system, NIE Networks has proposed that several strategic sites be upgraded to provide an element of N-2 redundancy to prevent long period outages if a high impact low probability event occurs.

NIE Networks' RP7 proposal

3.237 NIE Networks has identified 9 bulk supply points that have <50% back-feed capacity whilst still being compliant with the security of supply standard. One of these sites is being upgraded with a transmission solution through the D5 mechanism. Of the remaining 8 sites, the company has proposed 4 that are cost effective to upgrade and these are:

a) Coolkeeragh Main

b) Larne Main

c) Ballynahinch Main

d) Newry Main

3.238 The interventions at these site range between 33kV overhead line rebuild, underground cable overlay and new build circuits. These interventions are proposed to increase the capacity of the resupply circuits if both transformers or both 110kV incoming feeders go on fault simultaneously.

Draft determination

3.239 Whilst we agreed with the scope of the works proposed, we do not agree with the costs put forward in the submission. Our assessment of the cost for 33kV overhead line rebuild and the cost for 11kV overhead new build are vastly different from those proposed. We based our calculations on the cost for existing tasks in the D07 category for re-engineering 33kV lines which we asses as £30.8k/km.

3.240 For 11kV new build we based our calculations on the cost and volumes RIGs data. Generally, 11kV overhead lines contain 12 poles/km which are reported at £1.7k each. Conductor is reported at £10.4k/km. Therefore the unit rate of (12 x 1.7k)+10.4k=30.1k seems appropriate.

3.241 At the draft detetermination, we noted that we would continue to eep dialogue open with NIE Networks leading up to the final determination as we were made aware that costs for underground cables had been embedded in overhead line projects which may have skewed our cost assessment. Furthermore, we wished to explore the possibility of unitising this allowance to give greater protection to consumers.

Sub-programme	UoM		Volume	Unit Cost (£k)	Allowance (£k)
D57m	LS	NIE Networks' Proposal	N/A	N/A	4,087
	LS	Draft Determination	N/A	N/A	2,783
	Total Change +/-				-1,304
	Total Change %				-32%

Table 3.35: D57m draft determination

D57m final determination

3.242 In its response to our draft determination, NIE Networks stated that we had incorrectly used the network investment RIGs data to interpret costs for this sub-programme. In addition, the company also stated that there was a significant volume of underground cable cost embedded in the cost for 11kV overhead line new build and this was to account for the final connection into substations.

3.243 We agreed with the company that network investment RIGs data was not the best measure of unit cost as the data is specifically targeted at refurbishment works. Using cost and volume RIGs data gives us the ability to use average prices for:

a) 33kV poles

b) 33kV conductor

c) 11kV poles

d) 11kV conductor

e) 11kV cable

3.244 NIE Networks informed us that it had assumed 32% of the overall length for 11kV circuits would be underground cables. This causes a significant increase to the cost per km.

3.245 We re-calculated our analysis using cost and volume data and this is shown in Table 3.36 and Table 3.37 below.

Asset	Average Unit Cost (£k)	Volume/km	Cost/km
33kV Pole	1.935	10	19.350
33kV Conductor	12.214	3	36.642
			55.992

Note 1. Figures may not sum due to rounding.

Table 3.36: 33kV OHL new build unit cost

Asset	Average Unit Cost (£k)	Volume/km	Cost/km
11kV Pole	1.7	8.16	13.970
11kV Conductor	10.4	2.04	21.236
11kV Cable	87.2	0.32	27.905
			63.111

Note 1. Figures may not sum due to rounding.

Table 3.37: 11kV OHL new build unit cost

3.246 Applying the above re-calculated unit costs to NIE Networks proposed volumes increases our allowance by £1,037.772 and brings our final determination allowance within 7% of the amount proposed by NIE Networks.

3.247 Since NIE Networks has provided a discrete listing of projects for this funding, we will issue the allowance as unitised amounts per Table 3.38 below.

Sub-programme	UoM		Volume	Unit Cost (£k)	Allowance (£k)
Coolkeeragh Main 33kV Re-build	km	NIE Networks' Proposal	2.5	57.4	144
	km	Final Determination	2.5	56.0	140
Coolkeeragh Main 33kV PILC Replacement	km	NIE Networks' Proposal	0.5	303.0	152
	Km	Final Determination	0.5	303.0	152
Larne Main 33kV Rebuild	Km	NIE Networks' Proposal	9.2	57.4	528
	Km	Final Determination	9.2	56.0	515
Larne Main 33kV PILC Replacement	Km	NIE Networks' Proposal	4.6	303.0	1,394
	Km	Final Determination	4.6	303.0	1,394
Ballynahinch Main 33kV Rebuild	Km	NIE Networks' Proposal	25	57.0	1,436
	Km	Final Determination	25	56.0	1,400
Newry Main 11kV New Build	Km	NIE Networks' Proposal	3.5	124.0	434
	km	Final Determination	3.5	63.1	221
D57m: High Impact Low Probability	NIE Networks' Proposal				4,087
	Final Determination				3,821

Note 1. Figures may not sum due to rounding.

Table 3.38: D57m final determination

D101: Network alterations

Scope of work

3.248 D101 network alterations are works that are requested by third parties and that NIE Networks must fully or partially fund. There are two types of expenditure in this area as follows:

a) Non-recoverable alterations arise where a customer cannot be charged for an alteration to electricity equipment on their land. This arises where the alteration complies with conditions 12 and 13 of an established Wayleave Agreement or where a notice to remove equipment is enforced. For example: electricity infrastructure is impeding a bona fide development.

b) NIRAUC schemes arise where the Department for Infrastructure (DfI) requires NIE Networks to relocate its apparatus due to highway works. Under the Diversionary Works Code of Practice[32], developed by the Northern Ireland Road Authority and Utility Committees (NIRAUC), utility companies are required to contribute 18% towards the cost of moving its apparatus.

NIE Networks' RP7 proposal

3.249 NIE Networks forecast its D101 networks alterations expenditure for the RP7 period based on its experience to date in RP6. However, it has recommended that expenditure for the D101a non-recoverable alterations programme be subject to a pass-through style uncertainty mechanism. It has recommended this approach as the volume of activity in this area will be driven by customer behaviour and subsequent scope of required works that it has little control over. It believes this approach will give it greater protection should activity significantly increase over RP6 or should activity decrease, costs to consumers will be minimised.

3.250 NIE Networks' forecast D101 networks alterations expenditure for RP7 is set out in Table 3.39 below.

Sub-programme	UoM	Total Direct Proposal (£k)
D101a - Non-Recoverable Alterations	Lump Sum	18,188
D101b - NIRAUC schemes	Lump Sum	29
D101 Network Alterations Total		18,217

Note 1. Figures may not sum due to rounding.

Table 3.39: NIE Networks' D101: Network alterations proposal

3.251 NIE Networks has also proposed that the scope of works be increased over the current approach to non-recoverable alterations. Specifically, it considers that raising lines to achieve clearances over a property is no longer a technically acceptable solution. Instead, the overhead line route should be altered to ensure no properties are underneath. Currently this solution is offered to connecting customers, but with the customer bearing the additional costs over the line raise.

3.252 With this change in approach, it has forecast that non-recoverable alteration expenditure would require an increase of £5.4m over its RP7 ex-ante request. NIE Networks did not include this value in its ex-ante request but anticipated that its proposed pass-through style uncertainty mechanism will provide the necessary funding.

[32] https://www.infrastructure-ni.gov.uk/sites/default/files/publications/drd/code-of-practice-for-measures-necessary-where-apparatus-is-affected-by-major-work-diversionary-works-2nd-edition.pdf

Draft determination

3.253 We agreed that the volume and scope of work for the D101a non-recoverable alteration programme is influenced by factors outside of NIE Networks' control. However, applying a pass-through mechanism to this expenditure would reduce NIE Networks' incentive to reduce costs for required works.

3.254 We established a determined lump sum allowance for RP6 based on the outturn costs in RP5, as we expected historical spending to be a good predictor of future expenditure in this area. The annual average allowance for RP6 was £2,750k, which compares reasonably to the RP6 outturn of £2,885k to March 2023, a 4.9% difference. Applying the 50:50 cost risk sharing mechanism to this variation means the company has under recovered by £67.5k annually.

3.255 We had not implemented a pass-through mechanism for expenditure in this area for RP7. We wished to maintain a level of incentive for NIE Networks to minimise costs. The protection provided by the 50:50 cost risk sharing mechanism and low variance between allowance and outturn in RP6 gives comfort to continue our approach from RP6.

3.256 At the draft detemination stage, we determined the lump sum allowance for RP7 based on the RP6 outturn costs. We have taken the 2023 reporting year outturn into the RP6 average which has resulted in a reduction from NIE Networks' proposal. We proposed further engagement with NIE Networks during the consultation period to further consider its proposed change in approach to what is considered technically acceptable.

3.257 We accepted the proposed lump sum amount for NIRAUC schemes. We have noted that NIE Networks has underspent its RP6 allowance by £18k or 77% on an annual average basis. We understand that there has been a reduction in the level of works by DfI during the RP6 period, however, the value proposed for RP7 is sufficiently low to present a low risk to consumers.

Final determination

3.258 In its draft determination response NIE Networks deemed our use of RP6 outturn costs as the basis of the allowance to be inappropriate given the change in approach from raising the lines to diverting the lines. It also reiterated that it was still its preference that costs should be funded through a pass-through mechanism. It stated that this mechanism is the right tool to address the uncertainty on costs stemming from both the change in approach and the workstream's general dependence on future customer activity, which the company cannot control.

3.259 NIE Networks also provided its preferred option should UR not agree to a pass-through mechanism. It requested that the ex-ante allowance should be increased to include an additional £5.4m that it estimated would result from the change of approach. It also requested that this workstream be subject to a mid-period reopener at which outturn costs would be assessed, and a determination made for the remainder of the price control period.

3.260 We agree with the change in approach to line alterations, though additional alteration costs may be incurred, future costs resulting from access for maintenance difficulties and resolving bird fouling issues should reduce. Therefore, we agree with the company that our draft determination must be adjusted to accommodate the change.

3.261 We remain of the view that this works programme is not suitable to be treated as pass-through for the following reasons:

a) It would remove the company's incentive to keep costs to a minimum.

b) It would remove the company's incentive to keep activity to a minimum i.e. ensuring alterations are only carried when technically necessary.

c) It would be difficult to scrutinise costs to ensure they accurately reflect actual works carried out under this programme, given the range of activities that could be undertaken which are similar to other works carried out under other programmes. In contrast, the costs incurred in other areas being treated as pass-through, such as business rates and licence fees, can be directly and simply evidenced by the bill provided by the charging party.

3.262 To set an appropriate allowance, we considered allowing costs to be claimed through unit rates set for a range of activities and assets required to divert the existing line, with this approach allowing the allowance to flex with the required volume. However, there would be difficulty in identifying all activities and setting appropriate unit rates. This approach would also remove the company's incentive to keep activity to a minimum and was therefore rejected.

3.263 We queried the basis of NIE Networks' estimated £5.4m increase in costs. The company detailed that it had priced the additional costs required to complete a line diversion over a line raise on 60 jobs between April 2020 and October 2022, and offered this option at a direct cost to the customer as was the policy in RP6. The company then selected the highest priced job (£36.7k) from this sample and multiplied this by its forecast number of jobs for RP7 (147) based on the sample volume run rate. The company's selection of the highest price job was a result of its approach to only price jobs that it

considered would be economically feasible from an individual customer perspective, therefore the actual highest costs jobs were not assessed in the sample.

3.264 While the basis of the additional estimated costs may not be fully reflective of the change in approach, it is the most reasonable basis for providing the amendments to the allowance, in the absence of better mechanisms and data. The existing 50:50 cost risk sharing mechanism will continue to provide protection to the company and consumers, and therefore we are not allowing a mid-point reopener for this area.

3.265 We have increased the non-recoverable alterations allowance provided in the draft determination, which was based on RP6 outturn data, by £5.4m.

3.266 NIE Networks provided no comment on our draft determination for NIRAUC schemes, and no adjustment has been made to this allowance for the final determination.

3.267 Our final determination for D101 network alterations is set out in Table 3.40 below.

Sub-programme		UoM	Total Direct Proposal (£k)
D101a - Non-Recoverable Alterations	NIE Networks' Proposal	Lump Sum	18,188
	Draft Determination	Lump Sum	17,312
	Final Determination	Lump Sum	22,643
D101b - NIRAUC Schemes	NIE Networks' Proposal	Lump Sum	29
	Draft Determination	Lump Sum	29
	Final Determination	Lump Sum	29
D101: Network Alterations Total	NIE Networks' Proposal		18,217
	Draft Determination		17,341
	Final Determination		22,673

Note 1. Figures may not sum due to rounding.

Table 3.40: D101: Network alterations final determination

D603: Distribution protection

3.268 See GHD report in Annex R

D603: Distribution Protection Final Determination	NIE Networks' Proposal	5,924
	Draft Determination	3,342
	Final Determination	4,809

Table 3.41: D603 Distribution protection final determination

D604: Connections driven systems work

Scope of work

3.269 Connections-driven system work is carried out along with a new connection to the assets to which the new connection will connect. For example, an overhead pole may be in a condition where replacement is required to ensure the longevity of that connection and safety NIE Networks' staff who may be required to climb the pole to make the connection.

3.270 This lower-level asset replacement achieved alongside the connection job itself is not chargeable to the customer but compliments the planned asset replacement programmes carried out through condition and risk assessed methods. Further details on what works are and aren't chargeable to the connecting customer are detailed in NIE Networks' statement of charges[33]. Current connection charging methodology is currently undergoing a review[34].

NIE Networks' RP7 proposal

3.271 NIE Networks' forecast connections driven systems work expenditure for RP7 is set out in Table 3.42 below.

Sub-programme	UoM	Total Direct Proposal (£k)
D604a - Connection Driven Systems Work	Lump Sum	9,611

Table 3.42: NIE Networks' D604: Connections driven systems work proposal

Draft determination

3.272 We accepted the proposed lump sum amount for connection driven systems works. The value proposed is in line with outturn expenditure through RP6 to date, on an average annual basis. It was noted RP6 expenditure is currently c.£837k, or 108%, greater than the allowance on an annual average basis.

Final determination

3.273 NIE Networks did not comment on our draft determination for this works category, and no further adjustments have been made for the final determination.

3.274 Our final determination for connections driven systems work is set out in Table 3.43 below.

[33] https://www.nienetworks.co.uk/statementofcharges
[34] https://www.uregni.gov.uk/consultations/call-evidence-electricity-connection-policy-framework-review

Sub-programme		UoM	Total Direct Proposal (£k)
D604a - Connections Driven Systems Work	NIE Networks' Proposal	Lump Sum	9,611
	Draft Determination	Lump Sum	9,611
	Final Determination	Lump Sum	9,611

Table 3.43: D604: Connections driven systems work final determination

D605: Network access and commissioning

Scope of work

3.275 Network access and commissioning expenditure relates to two direct network activities which are not incorporated into the other specific programmes or projects. They are as follows:

a) Commissioning - this includes activities such as those required when a new network asset is connected, to ensure safe and proper operation, as well as ongoing testing of equipment and protective devices.

b) Network Access - these activities are required to isolate relevant assets in order to allow work or the connection of new assets to the network, and then to restore supplies and perform voltage checks.

NIE Networks' RP7 proposal

3.276 NIE Networks' forecast network access and commissioning expenditure for RP7 is set out in Table 3.44 below.

Sub-programme	UoM	Total Direct Proposal (£k)
D605a - Network Access and Commissioning	Lump Sum	9,514

Table 3.44: NIE Networks' D605: Networks access and commission proposal

Draft determination

3.277 We have accepted the proposed lump sum amount for network access and commissioning. The value proposed is a 27% decrease on the outturn expenditure through RP6 to date, on an average annual basis. It is noted RP6 expenditure is currently c.£1.3m, or 139%, greater than the allowance on an annual average basis.

3.278 Our draft determination for network access and commissioning is set out in Table 3.45 below.

Sub-programme		UoM	Total Direct Proposal (£k)
D605a - Network Access and Commissioning	NIE Networks' Proposal	Lump Sum	9,514
	Draft Determination	Lump Sum	9,514
	Total Change +/-		0
	Total Change %		0%

Table 3.45: D605: Network access and commissioning draft determination

D605 final determination

3.279 In its response to our draft determination, NIE Networks informed us that it had made an error in its calculation of costs for this sub-programme. It stated that it had submitted its costs in 2015/16 price base, and this was the cause of the below-expected funding request.

3.280 We raised query URQ-0004 to request full detail of the inflation adjustment calculation. In its response the company informed us that the original funding request was correct, and no further action was necessary.

Sub-programme		UoM	Allowance (£k)
D605a - Network Access and Commissioning	NIE Networks' Proposal	LS	9,514
	Draft Determination	LS	9,514
	Final Determination	LS	9,514

Note 1. Figures may not sum due to rounding.

Table 3.46: D605 final determination

D701: Earthing

Scope of work

3.281 Earthing systems for transmission and distribution equipment perform several safety related roles, these include

a) Ensuring sufficient fault current flows to enable the operation of protection equipment.

b) Providing a zero-volt reference point for transformers with a grounded star connection

c) Preventing step and touch voltages within substation boundaries providing a safe environment for staff

NIE Networks' RP7 proposal

3.282 NIE Networks has proposed 2 new strands of work for RP7 related to substation earthing.

(i) Earthing surveys - to locate defects

(ii) Earthing remediation - to repair the defects identified in (i) above

3.283 The purpose of the above tasks is to identify substations where the earthing conductors may be undersized to provide the necessary levels of protection

Sub-programme	EJP	UoM	Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D701a: Earthing surveys		LS	N/A	N/A	325
D701b: Earthing remediation		LS	N/A	N/A	1,947
D701 Total					2,271

Table 3.47: NIE Networks' earthing proposal

Draft determination

3.284 At the draft determination, we were minded to disallow the funding requested for substation surveys given the current allowances already in place to carry out substation inspections under IMF&T funding.

3.285 Transmission, primary distribution and secondary distribution sites containing batteries are inspected at frequencies of 5 to 13 weeks and these inspections include but are not limited to:

a) plant and apparatus condition

b) visual inspection of substation buildings, civil works and fabric

3.286 We believe the earthing system is part of the substation apparatus and, therefore, should have its condition checked during the inspections.

3.287 However, we did allow the funding for remediation works as this requires new capital expenditure to bring the substations up to the required standard.

Sub-programme	UoM		Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D701a: Earthing surveys	LS	NIE Networks' Proposal	N/A	N/A	325
	LS	Draft Determination	N/A	N/A	0
D701b: Earthing remediation works	LS	NIE Networks' Proposal	N/A	N/A	1,947
	LS	Draft Determination	N/A	N/A	1,947
D701	NIE Networks' proposal				2,271
	Draft Determination				1,945
	Total Change +/-				-325
	Total Change %				-14%

Table 3.48: D701 Draft determination

D701 Final determination

3.288 NIE Networks responded to our draft determination and informed us that it believed we were in error to disallow the funding for earthing surveys. It stated that the testing required to ascertain the condition of the substation earthing system is not a task that could be undertaken during a visual inspection. The company intends to outsource the testing and compilation of results to a third party to avoid the need to purchase specialist equipment and negate the need to employ its own asset engineers to conduct this task.

3.289 The information provided in the draft determination response convinced us to allow the funding in full.

3.290 We reviewed the company's original submission and found that volumes and unit costs had been provided so we have decided to allow the funding as a unitised allowance per Table 3.49

3.291 NIE Networks provided no comment on the draft determination of the remaining sub-programmes, and no adjustment has been made to these allowances for the final determination.

Sub-programme	UoM		Volume	Unit Cost (£k)	Allowance (£k)
D701a: Earthing surveys	Site	NIE Networks' Proposal	100	3.2	325
	Site	Draft Determination	0	3.2	0
	Site	Final Determination	100	3.2	325
D701b: Earthing remediation works	Site	NIE Networks' Proposal	280	7.0	1,947
	Site	Draft Determination	280	7.0	1,947
	Site	Final Determination	280	7.0	1,947
D701	NIE Networks' Proposal				2,271
	Draft Determination				1,947
	Final Determination				2,271

Note 1. Figures may not sum due to rounding.

Table 3.49: D701 Earthing final determination

D702: System performance

Scope of work

3.292 Travel and fault diagnosis are large contributors to the time taken to restore faults. This inconveniences the consumers affected by the fault.

3.293 New technology in the form of Active Network Management (ANM) devices can be remotely operated via the SCADA system and will allow rapid network reconfiguration to restore supplies.

3.294 In RP6, we identified a developmental objective to establish a Worst Served Customer (WSC) related time series to inform RP7 with respect to targeted standards and/or investment to improve the volumes of WSC

3.295 NIE Networks developed data sets against 3 different metrics, these were

a) NIE Networks RP6 metric – a customer who experiences 6 or more unplanned high voltage interruptions to supply in 18 months (Figure 3.5)

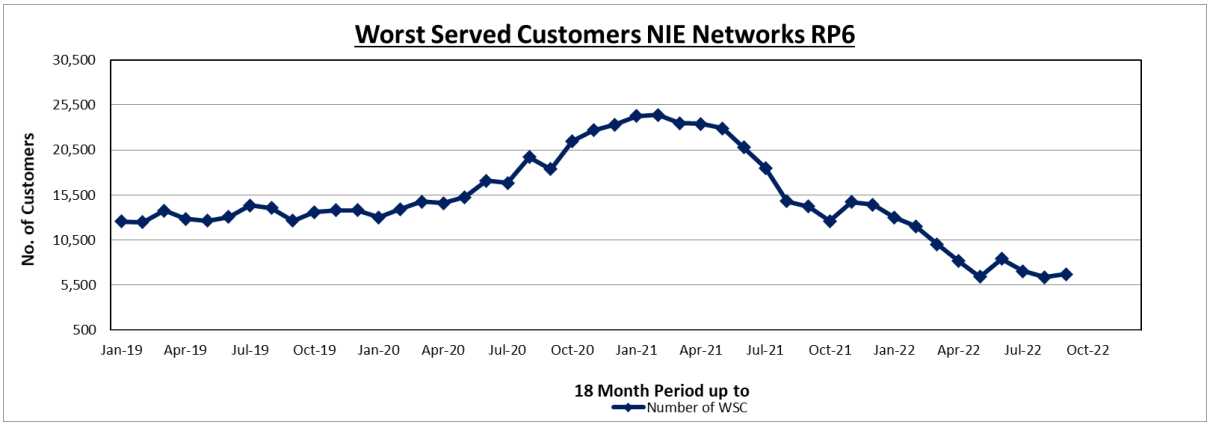


Figure 3.5: WSC – NIE Networks correct definition

b) Ofgem RIIO-ED1 metric – a customer who experiences 12 or more unplanned high voltage interruptions to supply in 3 years, with 3 or more interruptions in each 12-month period (Figure 3.6)

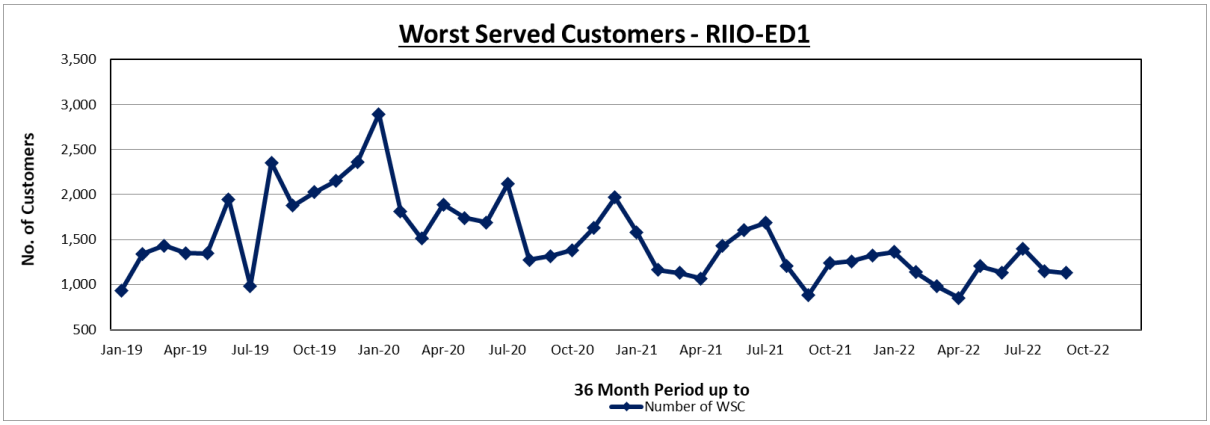


Figure 3.6: WSC - Ofgem RIIO-ED1 metric

c) Ofgem RIIO-ED2 metric – a customer who experiences 12 or more unplanned high voltage interruptions to supply in 3 years, with 2 or more interruptions in each 12-month period (Figure 3.7)

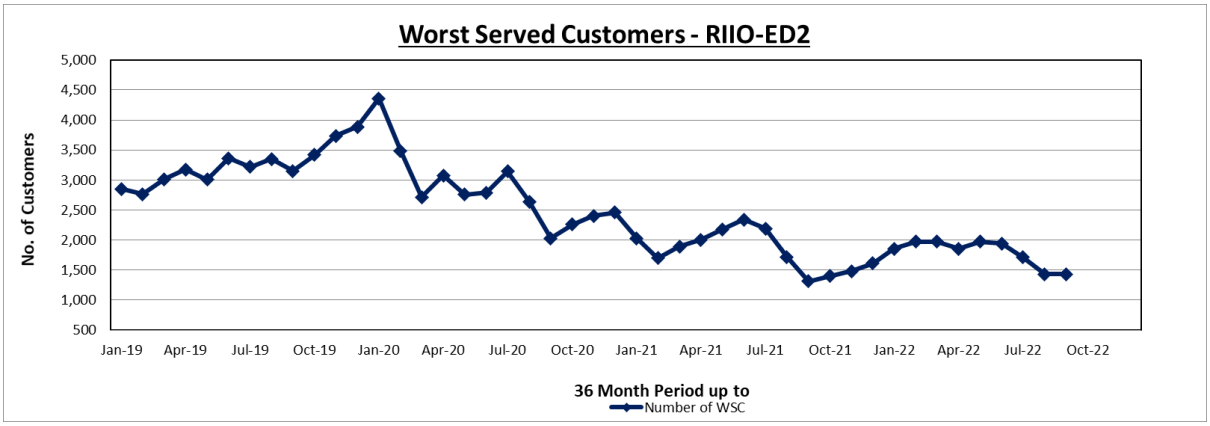


Figure 3.7: WSC - Ofgem new RIIO-ED2 metric

NIE Networks' RP7 proposal

3.296 The company is proposing to adopt the RIIO-ED2 metric for reporting in RP7. We are in agreement with the adoption of this metric as the RP6 metric does not portray an accurate representation of WSCs due to the volume of customers who may have been subject to a one-off short period of frequent interruptions which could have subsequently been resolved.

3.297 The Ofgem metrics provide a much clearer representation of volumes of WSCs due to the long and short-term data included in the calculation. Furthermore, adoption of the ED2 metric will allow future direct benchmarking with GB DNOs.

3.298 NIE Networks has also proposed an ex ante lump sum allowance of £3m to enable works on 15 specific HV circuits which will reduce the volume of WSCs by 50% during RP7

Draft determination

3.299 We are in agreement with the introduction of HVANM devices but were concerned that the proposed CML improvements would be rewarded through the reliability incentive thus making the capital allowance redundant causing the company to be over-compensated. Consequently, the reliability incentive was calibrated to take account of HVANM (see Annex M).

3.300 At the draft determination, we were minded to disallow the funding proposed for WSC.

3.301 The company has stated in its submission that current asset investment programmes will have a small effect on the volume of WSCs. This is due to the limited overlap between rogue circuits requiring cyclic investment and circuits supplying most WSCs.

3.302 Our view is, we are minded to allow ~£195m[35] for HV overhead line works during RP7 and we believe this provides sufficient funding and flexibility to allow the company to deliver its RP7 WSC aspirations.

[35] £192m for 11kV rebuild + £3m for 11kV remedial works

Sub-programme	UoM		Volume	Unit Cost (£k)	Total Direct Proposal (£k)
D702a: Worst Served Customers	LS	NIE Networks' Proposal	N/A	N/A	3,000
	LS	Draft Determination	N/A	N/A	0
D702b: HV Active Network Management	LS	NIE Networks' Proposal	N/A	N/A	10,719
	LS	Draft Determination	N/A	N/A	10,719
D702	NIE Networks' Proposal				13,719
	Draft Determination				10,719
	Total Change +/-				-3,000
	Total Change %				-22%

Table 3.50: D702 Draft determination

D702 final determination

3.303 We met with NIE Networks to discuss the issue of Worst Served Customers in March 2024. During the meeting, the company provided significant volumes of additional information to justify its request for funding.

3.304 We were convinced by the new information that our draft determination of disallowing all funding required revision. The main reason for our re-evaluation was that NIE Networks is required to carry out certain works that would not be included in the allowances for 11kV rebuild. This included, but is not limited to:

a) Fitting Automatic Sectionaliser Links (ASLs)

b) Fitting fully shrouded conductor

c) Reconfiguring networks using underground cables

3.305 The company was unable to provide a fully costed list of works as the technical solutions required have not yet been fully researched. However, we are of the opinion that allowing the funding requested together with a reporting regime to measure the number of Worst Served Customers is a relatively low risk and will provide valuable learning for RP8. To this end we will develop the necessary reporting structure in the first year of the RP7.

3.306 We will develop additional reporting requirements in the RIGs to ensure that the works executed to reduce Worst Served Customers is recorded to provide learning for RP8

3.307 NIE Networks provided no comment on the draft determination of the remaining sub-programmes, and no adjustment has been made to these allowances for the final determination.

Sub-programme	UoM		Volume	Unit Cost (£k)	Allowance (£k)
D702a: Worst Served Customers	LS	NIE Networks' Proposal	N/A	N/A	3,000
	LS	Draft Determination	N/A	N/A	0
	LS	Final Determination	N/A	N/A	3,000
D702b: HV Active Network Management	LS	NIE Networks' Proposal	N/A	N/A	10,719
	LS	Draft Determination	N/A	N/A	10,719
	LS	Final Determination	N/A	N/A	10,719
D702: System Performance	NIE Networks' Proposal				13,719
	Draft Determination				10,719
	Final Determination				13,719

Note 1. Figures may not sum due to rounding.

Table 3.51: D702 final determination

T10: 110kV switchgear

3.308 See GHD report in Annex R

T10: 110kV Switchgear Final Determination	NIE Networks' Proposal	1,565
	Draft Determination	798
	Final Determination	1,048

Table 3.52: T10: 110kV switchgear final determination

T11: 275kV plant ancillaries

3.309 See GHD report in Annex R

T11: 275kV Plant Ancillaries Final Determination	NIE Networks' Proposal	3,816
	Draft Determination	3,499
	Final Determination	3,658

Table 3.53: T11: 275kV plant ancillaries final determination

T12: 110kV plant ancillaries

3.310 See GHD report in Annex R

T12: 110kV Plant Ancillaries Final Determination	NIE Networks' Proposal	11,322
	Draft Determination	10,308
	Final Determination	10,680

Table 3.54: T12: 110kV plant ancillaries final determination

T13: 275/110kV transformers

3.311 See GHD report in Annex R

T13: 275/110kV Transformers Final Determination	NIE Networks' Proposal	10,570
	Draft Determination	9,953
	Final Determination	10,570

Table 3.55: T13: 275/110kV transformers final determination

T14: 110/33kV transformers

3.312 See GHD report in Annex R

T14: 110/33kV Transformers Final Determination	NIE Networks' Proposal	9,073
	Draft Determination	8,640
	Final Determination	8,898

Table 3.56: T14: 110/33kV transformers final determination

T15: 22kV reactors

3.313 See GHD report in Annex R

T15: 22kV Reactors Final Determination	NIE Networks' Proposal	2,087
	Draft Determination	1,570
	Final Determination	1,580

Table 3.57: T15: 22kV reactors final determination

T16: Transmission transformer refurbishment

3.314 See GHD report in Annex R

T16: Transmission Transformer Refurbishment Final Determination	NIE Networks' Proposal	1,416
	Draft Determination	1,246
	Final Determination	1,256

Table 3.58: T16: Transmission transformer refurbishment final determination

T17: 275kV transmission overhead lines

3.315 See GHD report in Annex R

T17: 275kV Transmission Overhead Lines Final Determination	NIE Networks' Proposal	18,696
	Draft Determination	18,009
	Final Determination	18,823

Table 3.59: T17: 275kV transmission overhead lines final determination

T19: 110kV transmission overhead lines

3.316 See GHD report in Annex R

T19: 110kV Transmission Overhead Lines Final Determination	NIE Networks' Proposal	18,204
	Draft Determination	15,791
	Final Determination	17,093

Table 3.60: T19: 110kV transmission overhead lines final determination

T20: Transmission underground cables

3.317 See GHD report in Annex R

T20: Transmission Underground Cables Final Determination	NIE Networks' Proposal	4,702
	Draft Determination	3,714
	Final Determination	4,316

Table 3.61: T20: Transmission underground cables final determination

T602: Transmission protection

3.318 See GHD report in Annex R

T602: Transmission Protection Final Determination	NIE Networks' Proposal	5,697
	Draft Determination	5,433
	Final Determination	5,547

Table 3.62: T602: Transmission protection final determination

T603: Network access and commissioning

Scope of work

3.319 See Paragraph 3.275 for scope of work

NIE Networks' RP7 proposal

3.320 NIE Networks' forecast network access and commissioning expenditure for RP7 is set out in Table 3.63 below.

Sub-programme	UoM	Total Direct Proposal (£k)
T603a - Network Access and Commissioning	Lump Sum	2,274

Table 3.63: NIE Networks' T603: Networks access and commission proposal

Draft determination

3.321 Whilst the proposed value represents a significant increase above RP6 allowance (around 66%), it also represents the outturn run rate to date during RP6. Therefore, we have accepted the proposed lump sum amount.

3.322 Our draft determination for network access and commissioning is set out in Table 3.64 below.

Sub-programme		UoM	Total Direct Proposal (£k)
T603a - Network Access and Commissioning	NIE Networks' Proposal	Lump Sum	2,274
	Draft Determination	Lump Sum	2.274
	Total Change +/-		0
	Total Change %		0%

Table 3.64: T603: Network access and commissioning draft determination

Final determination

3.323 The company did not provide a response to our draft determination and we have made no changes.

Sub-programme		UoM	Allowance (£k)
T603a - Network Access and Commissioning	NIE Networks' Proposal	LS	2,274
	Draft Determination	LS	2.274
	Final Determination	LS	2,274

Note 1. Figures may not sum due to rounding.

Table 3.65: T603 Final determination

T701: Strategic spares

3.324 See GHD report in Annex R

T701: Strategic Spares Final Determination	NIE Networks' Proposal	4,414
	Draft Determination	4,414
	Final Determination	4,356

Table 3.66: T701: Strategic spares final determination

T702: Earthing surveys

3.325 See Paragraph 3.284

Sub-programme	UoM		Volume	Unit Cost (£k)	Total Direct Proposal (£k)
T701a: Earthing Surveys Final Determination	LS	NIE Networks' Proposal	48	4.2	200
	LS	Draft Determination	0	4.2	0
	LS	Final Determination	48	4.2	200

Table 3.67: T701: Earthing surveys final determination