



ANNEX 17: REVIEW OF RIIO-ED1 SUBMISSION BY PB POWER

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Review of Electricity North West Limited's RIIO-ED1 Submission

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ABBREVIATIONS

CAPEX	Capital Expenditure
CB	Circuit Breaker
CBA	Cost Benefit Analysis
CBRM	Condition Based Replacement Model
CEPA	Cambridge Economic Policy Associates
CI	Customer Interruptions
CML	Customer Minutes Lost
CoP	Code of Practice
DPCR5	Distribution Price Control Review 5
DNO	Distribution Network Operator
ED1	Energy Distribution 1
EHV	Extra High Voltage
ENWL	Electricity North West Limited
ESQCR	Electricity, Safety, Quality and Continuity Regulations
GD1	Gas Distribution 1
GM	Ground Mounted
HV	High Voltage
ID	Indoor
LCT	Low Carbon Technology
LI	Load Index
LV	Low Voltage
MAMS	Master Asset Management Systems
MWh	Mega Watt Hour
NRSWA	New Road and Street Works Act
NPV	Net Present Value
KV	Kilovolts

OD	Outdoor
OFGEM	Office of Gas and Electricity Markets
OHL	Overhead Line
PSR	Priority Services Register
RAV	Regulatory Asset Value
RIIO	Revenue = Incentives + Innovation + Outputs
RIG	Regulations, Instructions and Guidance
RMU	Ring Main Unit
SOP	Suspension of Operational Practice
UG	Underground
WJBP	Well Justified Business Plan

1 INTRODUCTION AND RECOMMENDATIONS

Electricity North West Limited retained Parsons Brinckerhoff to undertake a review of its submission to Ofgem under the RIIO-ED1 price control review.

We reviewed various reports and spreadsheets which Electricity North West Limited has prepared in order to justify its proposed expenditure over the RIIO-ED1 price control period. The information we received was sometimes in draft form and we saw various iterations of plans as Electricity North West Limited finalised its proposals.

The aim of our review was fourfold:

- To assess the proposed volumes of assets and expenditure
- To review the substantiation of the investment case
- To examine the linkage between the proposed expenditure and outputs; and
- To review various Cost benefit Analyses related to specific expenditure programmes

The main body of this report review's Electricity North West Limited's programme of expenditure. In Section 2 we review the justification of increases in expenditure over the DPCR5 period (2010-15) and make a comparison of proposed volumes with those derived from independent modelling approaches we also review the justification of overall scale of capex and balance between programmes. In Section 3 we review the linkages between the proposed expenditure and outputs. The Annex contains Parsons Brinckerhoff's review of Electricity North West Limited's presentation of its expenditure programme. In the Annex we test any claimed links to stakeholder inputs, review the substantiation of the business case and review Cost Benefit Analyses for various investment proposals.

1.1 Recommendations

Our recommendations are included in the bulk of our report, however, for ease of reference we have amalgamated them below:

Justification of increases over the DPCR5 period (2010-15)

We recommend that the Well Justified Business Plan clearly outlines the drivers for expenditure.

Justification of overall scale of capex and balance between programmes

Our recommendations are:

- Complete the reinforcement commentary
- Explain the benefits of the Future Headroom Capacity model
- Explain how the Transform model is customised
- State more clearly which forecast has been used as the basis for investment figures
- Explain why there is zero expenditure forecast for BT21CN
- Explain further any policy on refurbishment versus replacement (or reinforcement versus replacement)

2 ASSESSMENT OF PROPOSED VOLUMES

2.1 Justification of increases over the DPCR5 period (2010-15)

In its submission to Ofgem, Electricity North West Limited will submit proposed expenditure levels based on different volumes of assets to be replaced, acquired or refurbished across a range of asset categories during RIIO-ED1.

This review looks at volume increases in assets during the current regulatory period – DPCR5. We have analysed, where possible, Electricity North West Limited’s rationale for volume increases during the current regulatory period. We believe that our review will be useful in justifying the merits of future volumes of assets.

Electricity North West Limited has proposed volumes and calculated costs for asset types across a diverse range of asset categories. For some of these categories the anticipated interventions during RIIO-ED1 will be higher than what is currently undertaken in the DPCR5 period. A majority of these increases originate from an ageing population of assets and the need to embark on network improvement activities geared towards network resilience, reliability, availability, safety and high network performance¹.

A summary of annual average increases in expenditure for the on-going DPCR5 and projected RIIO-ED1 periods is illustrated in the table below.

¹ *Our Track Record: Delivering investment for customers; WJBP V4 Narrative Document; Section 2.2; page 18*

Annual Average Increases in Expenditure					
Price Control Connection Projects	DPCR5: 5 Year Period 2010 – 2015	RIIO-ED1: 8 Year Period 2016 – 2023	On-going Period	RIIO-ED1 Period	Percentage Increases
	(£m)	(£m)	Average Annual Spend (£m)		%
Legal & Safety	13.9	41.4	2.8	5.2	85%
Asset Replacement	243.2	405.9	48.6	50.7	4%
Refurbishment	44.5	112.1	8.9	14.0	57%
Civil Works	26.4	79.2	5.3	9.9	87%
ESQCR	29.3	0.0	5.9	0.0	-100%
Flooding	7.9	10.3	1.6	1.3	-20%
Other Resilience	0.0	17.3	0.0	2.2	n/a
Reinforcement	84.0	115.6	16.8	14.4	-14%
Diversions	18.2	28.3	3.6	3.5	-2%
Undergrounding	6.1	9.0	1.2	1.1	-6%
Environmental	3.1	6.7	0.6	0.8	40%
Quality of Supply	30.0	0.0	6.0	0.0	-100%
Worst-served customers	2.2	3.4	0.4	0.4	-3%
Losses	0.0	10.0	0.0	1.3	n/a
Total	508.8	839.2	101.8	104.9	3%

Source: Electricity North West Limited WJBP v4

Annual average expenditure for the 14 categories of network investment programmes in RIIO-ED1 is 3 percent higher than that for DPCR5. Expenditure on Asset Replacement, Refurbishment and Reinforcement programmes accounts for around 48 percent of the total investment spend over the RIIO ED1 period.

Electricity North West Limited has also prepared a network investment summary² with associated gross costs for core, non-core and stand alone funding price controlled activities for both DPCR5 and RIIO-ED1 period. This is summarised in the table below.

² C10: Summary – Network Investment by Category ENWL_RIIO_ED1_Network_Investment_10 June 2013; Table C10-NI Summary

Summary of Network Investment by Category of Connection Projects for DPCR5 and RIIO-ED1																	
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	DPCR5	RIIO-ED1	Increases
Connection projects	Within Price Control	DPCR5 (£m)					RIIO-ED1 (£m)								(£m)	(£m)	%
Core	Diversions	4.01	4.47	5.23	2.32	2.15	3.49	3.55	3.21	5.21	3.20	3.20	3.20	3.20	18.2	28.3	56%
Core	Reinforcement – General	5.07	10.48	15.96	25.64	24.99	10.62	14.69	8.74	10.63	11.89	9.09	16.71	16.28	82.1	98.7	20%
Core	Reinforcement - DSM Payments to avoid Reinforcement	0.05	-	-	0.05	0.15	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.3	2.0	699%
Core	Fault Level Reinforcement	0.54	0.45	0.48	0.21	0.94	0.73	1.48	1.16	1.73	2.10	4.26	2.71	0.73	2.6	14.9	470%
Core	ESQCR	4.19	5.42	5.73	6.68	7.25	-	-	-	-	-	-	-	-	29.3	-	-100%
Core	Asset Replacement	34.25	47.23	55.45	56.61	46.64	48.69	42.48	49.50	43.30	53.83	49.78	50.52	50.91	243.2	389.0	62%
Core	Refurbishment	7.33	11.94	7.28	7.37	10.54	13.95	14.44	13.68	14.17	13.69	14.18	13.69	14.25	44.5	112.1	152%
Core	Civil Works	4.46	5.67	5.27	5.12	5.84	9.92	9.92	9.92	9.92	9.92	9.92	9.92	9.75	26.4	79.2	200%
Core	Operational IT & Telecoms																0%
Core	Legal and Safety	1.69	2.98	3.38	3.11	2.74	5.51	5.34	5.19	5.10	5.07	5.07	5.07	5.10	13.9	41.4	198%
Core	QoS	2.59	7.06	5.48	8.19	6.70	-	-	-	-	-	-	-	-	30.0	-	-100%
Core	High Value Projects (ex ante)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
Core	High Value Projects (re-openers)						-	0.46	70.03	75.14	32.71	10.65	8.80	9.65	-	207.4	-100%

Non Core	Flooding	3.49	2.29	1.68	0.41	0.03	2.39	2.36	2.34	2.30	0.86	-	-	-	7.9	10.3	30%
Non Core	BT21CN	3.26	5.53	8.43	5.00	0.50	-	-	-	-	-	-	-	-	22.7	-	100%
Non Core	Technical losses						2.50	2.50	2.50	2.50	-	-	-	-	-	10.0	30%
Non Core	Environmental	0.13	0.94	1.11	0.49	0.40	0.88	0.88	0.88	0.88	0.88	0.88	0.70	0.70	3.1	6.7	-100%
Non Core	High Impact Low Probability (HILP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%
Non Core	CNI	-	-	-	-	-	2.60	-	-	-	-	-	-	-	-	2.6	100%
Non Core	Black Start	-	-	-	-	-	-	-	-	-	-	4.89	4.89	4.92	-	14.7	100%
Non Core	Rising mains and laterals	-	-	0.45	0.93	1.65	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	3.0	16.9	456%
Stand Alone Funding (RAV)	Undergrounding Within/ Outside designated areas	0.24	1.19	1.33	1.87	1.47	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	6.1	9.0	47%
Stand Alone Funding (RAV)	Worst Served Customers	-	-	0.32	1.05	0.84	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	2.2	3.4	52%
Total		71.3	105.7	117.6	125.0	112.8	105.2	102.0	171.1	174.8	138.1	115.8	120.1	119.4	532.4	1,046.5	97%

Source: Electricity North West Limited; C10 - Network Investment Summary; ENWL_RIIO-ED1_Network_Investment_10Jun2013

During DPCR5 Asset Replacement, Refurbishment, Civil Works and Diversions represent the categories which represent the greatest levels of investment. Parsons Brinckerhoff's review of the justification of expenditure increases over DPCR5 has focused on these project categories:

2.1.1 Asset Replacement Projects

Electricity North West Limited uses a Condition-Based Replacement Model (CBRM) process which involves analysis of detailed asset registry condition data in order to generate Health Index (HI) scores. The HI scores act as 'triggers' which may lead to expenditure on replacing assets.

We have selected asset types for which expenditure on replacement programmes has increased between 2010 and 2015. The programmes below are listed in order of magnitude of expenditure and account for 47 percent of the total direct costs for the DPCR5 period. (Source ENWL_RIIO_ED1_Network Investment 10June2013 spreadsheet, tab CV3 asset replacement).

These asset types are:

- 33KV Underground Cable (Non Pressurised)
- 132KV Transformer
- 6.6/11kV Underground Cables
- 6.6/11kV Poles
- 132kV Underground Cable (Non Pressurised)
- 132kV Circuit Breaker (Gas Insulated Busbars)

2.1.1.1 33KV Underground Cable (Non Pressurised)

We have appraised projects such as the replacement of oil-filled 33kV underground cables targeted at improved network performance and reduced fault levels, ESQCR, reliability and availability on the 33kV network circuits. Our observation is that Electricity North West Limited's intention to introduce higher resilience and safeguards to the network justify the increase in volumes and costs. These increases are also driven by public safety, environmental performance and customer satisfaction in the form of reduced CIs and CMLs.

We expect the expenditure of £28 million which represents approximately 12 percent of the overall spend over DPCR5 to be justified by these drivers.

2.1.1.2 132kV Transformer

The need to size up the primary network with transformers of sufficient capacity to meet varying but incremental peak demands on the system is imperative and necessary to maintain acceptable Load Index (LI) levels, especially as network operations transition to a low carbon economy. Electricity North West Limited has implemented a mix of replacement and refurbishment projects as intervention schemes for this asset category. These have introduced cost saving measures through least and we view these as very commendable. These projects account for 11 percent of the overall total direct costs for asset replacement schemes between 2010 and 2015.

We view the £19 million investment in these areas as being driven by customers and increased inflation in manufacturing. These two drivers are considered as significant justifications for increases in DPCR5, as is observed with the 33kV underground cables. We also believe that the reference to existing competitive tendered rates and empirical data used for the determination of unit costs in DPCR5 serves as additional justification for increases in expenditure.

2.1.1.3 6.6/11kV Underground Cable

Our observations here are similar to those we made for 33kV underground non-pressurised cables. A total of 154 kilometres of 6.6/11kV underground cables were earmarked for replacement at a total cost of £19 million, which represents approximately 8 percent of the total direct costs for the 2011-2015 period. Despite the 32 percent increase in expenditure forecast for RIIO-ED1, we consider the replacement strategy adopted for this asset as necessary for the establishment of a reliable network capable of meeting customer expectations.

2.1.1.4 6.6/11kV Poles

A population of 7,779 overhead poles for 6.6/11kV circuits has been identified for replacement at a cost of £14 million over DPCR5. Electricity North West Limited has stated that the degree of deterioration of these assets requires the replacement of poles in order to maintain a continuity of supply to customers on the secondary network. This quality of supply need appears to justify the increases in volumes over the period. The RIIO-ED1 investment plan adopts the on-going strategy of continuous replacement of these poles but at a reduced cost of £2 million.

We therefore accept that reliability, availability and regulatory compliance to the security of supply are drivers which justify these increases. We believe these will most likely be scrutinised by Ofgem.

2.1.1.5 132kV Underground Cable (Non-Pressurised)

The same principle that holds for the replacement of 33KV underground cables has been adopted for the replacement of this asset type. £13 million was allocated over DPCR5 for the delivery of 40 kilometres of 132kV non-pressurised underground cables. This represents 5 percent of the total capital expenditure for the programme. The potential for a protracted disconnection of customer supplies due to faults and the loss of multiple circuits at potential pinch points is severe. This largely justifies the need for investment in the area of remedial works on underground cables along the 132KV circuits and the costs allocated to mitigate risks that could emerge in identified areas with the potential for such events.

The programme is an on-going scheme and we note the reduction in the number of interventions forecast over the RIIO-ED1 period.

2.1.1.6 132kV CB (Gas Insulated Busbars) (ID) (GM)

The ability of switchgear to effectively isolate a fault without compromising the safety of the public or field personnel, or the security of the network, is crucial to the operation of a reliable and safe network. Further to the approval and adoption of free standing GIS outdoor switchgears, Electricity North West Limited embarked on the replacement of 132kV air insulated switchgears with circuit breakers installed with gas insulation busbars. We note that this is part of an on-going attempt to identify switchgear assets and components approaching end-of-life and to specify appropriate intervention strategies intended to improve safety expectations. We believe that this justifies the increases in volumes and costs over the current period.

2.1.2 Refurbishments

At a total cost of £44.5 million, refurbishment programmes constitute around 9 percent of costs allocated to projects between 2010 and 2015. This cost allocation is for the delivery of remedial activities for various asset types across all voltage levels of the primary and secondary networks of the Electricity North West Limited distribution system.

We understand that, similar to strategies implemented for asset replacement programmes, Electricity North West Limited has identified volumes based on a CBRM process. This establishes the health of assets and recommends fit-for-purpose interventions to minimise the

probability of the failure of the assets and to avoid the financial and reputational consequence of such failures.

We examined three refurbishment programmes with the largest increases in expenditure over the DPCR5 period: (Source ENWL_RIIO_ED1_Network Investment 10June2013 spreadsheet, tab CV5 Refurbishment)

- Refurbishment – 6.6/11kV Poles
- Refurbishment – 132kV Tower Foundation
- Refurbishment – LV Poles

These activities constitute 62 percent of the overall refurbishment connection projects for the DPCR5 period. The largest refurbishment programmes during DPCR5 are given in the following table:

Refurbishment Programmes in Order of Magnitude of Expenditure for DPCR5							
Refurbishment Programme				Volumes		Total Direct Costs	
Asset category	Activity	Voltage	Units	DPCR5	RIIO-ED1	DPCR5 (£m)	RIIO-ED1 (£m)
6.6/11 kV Poles	Refurbishment - Poles	HV	#	25,495	28,207	16	13
132kV Tower	Refurbishment - Tower Foundation	132kV	#	-	-	8	-
LV Poles	Refurbishment - Poles	LV	#	13,448	11,721	4	5

Source: Electricity North West Limited; CV5 – Refurbishment Investment Plan: ENWL_RIIO-ED1_Network_Investment_10June2013

2.1.2.1 6.6/11KV Poles

Electricity North West Limited, in its Business Plan Commentary, gives a combination of replacement and refurbishment projects that will deliver the management of secondary network overhead lines. As stated in the previous sections, we understand that the decision to mix and match asset management programmes is intended to reduce project costs and hence the use of least cost options of remedial interventions for deteriorated pole assets.

Our understanding is that these volumes come from identified assets with higher frequency inspection regimes, hence resulting in higher intervention and maintenance works. We note that 22,495 poles were identified to undergo intervention activities, at a total cost of £16 million, over DPCR5 account for 25 percent of the total spend for refurbishment programmes.

We believe that increased volumes are justified on the grounds of legal compliance, overall public safety, acceptable whole-life asset performance and customer satisfaction. Equally, we

believe the scheme, which is expected to increase in direct cost over RIIO-ED1 by 50 percent, reinforces Electricity North West Limited's commitments to reducing costs associated to entire pole replacements.

2.1.2.2 132KV Tower Foundation

Remedial works for 132kV steel tower foundations can be a complicated exercise. As such, survey exercises undertaken by Electricity North West Limited (to identify and collect accurate condition data representing information on levels of dilapidation) are of importance to the understanding of the scale and type of intervention necessary to restore the assets to acceptable structural standards.

We understand that, although the need to reduce intervention based costs is crucial, the safety of the public should not be undermined and tower refurbishment works defined by Ofgem Regulations, Instructions and Guidance (RIG) will come at a cost. Issues such as tower location and the degree of tower foundation dilapidation need to be considered before accurate interventions can be prescribed. Such considerations demonstrate that risk mitigation measures have been taken to ensure safety. We consider increases aimed at ensuring public safety a very important justification for the remedial works.

The total direct cost of £8 million, which represents 18 percent of the total spend on refurbishment works over DPCR5, can be justified by the need to ensure public safety and the requirement to maintain security of supply in the event of a failure of the tower foundation.

2.1.2.3 LV Poles

Observations made for remedial works planned on LV poles are similar to those stated for the 6.6/11kV pole asset types. The activities specified to restore LV poles to fit-for-purpose condition is understood to be part of a combination of refurbishment and replacement projects aimed at extending the asset life and reducing costs. We note that these volumes come from poles identified with condition data captured during frequent and up-to-date plant inspections and surveys backed up with photographic evidence suggesting the criticality level of plant deterioration thus leading to increased levels of intervention and maintenance works.

Once again, we consider the drive to reduce costs by refurbishing more poles over DPCR5 justifies the £4million spend and the increases in volume during this period

2.1.2.4 Civil Works

Electricity North West Limited recognises that these are the assets (including substation plinths, buildings, tunnels, bridges and compounds) most visible to the general public. Hence,

volumes have been identified, and remedial works prioritised, following elaborate asset inspections and conditioning processes where weighted HI scores were used to determine levels of deterioration. As such, we agree with Electricity North West Limited that projects that need to keep these structures in good condition are mandatory.

Electricity North West Limited has invested £26.4 million over DPCR5 to ensure that all civil structures meet statutory safety standards. We agree with Electricity North West Limited's suggestion that these investments are driven by the need to intervene in restoring dilapidated civil items and replace component assets (like doors, roofs, earth rods and bars, and plinths) within and around the structures. These two drivers justify the increases we have identified for a majority of the secondary indoor 6.6/11kV substations. We would, however, recommend that this case be clearly stated in the business proposal. The intention to increase activities in RIIO-ED1 should be equally underpinned by emphasising the same case of safe buildings and good neighbourhood assurance.

The entire programme represents approximately 5 percent of the entire network investment expenditure for the period between 2010 and 2015.

2.1.3 Diversions (Non-Rechargeable)

Our review shows that projects under this investment plan are categorised into 3 separate schemes. These are:

- Injurious Affection Claims
- Highway Diversions (NRSWA)
- Wayleave Terminations

Expenditure on non-rechargeable Diversionary projects is given in the following table:

Summary of Non-Rechargeable Diversionary Projects				
Programme Category			Total Direct Costs	
Diversion (non-fully rechargeable)	Voltage	Units	DPCR5 (£m)	RIIO-ED1 (£m)
Conversion of wayleaves to easements, easements, injurious affection	LV	Claims settled	-	-
Conversion of wayleaves to easements, easements, injurious affection	HV	Claims settled	0.13	0.28
Conversion of wayleaves to easements, easements, injurious affection	EHV	Claims settled	0.34	1.09
Conversion of wayleaves to easements, easements, injurious affection	132kV	Claims settled	7.11	9.91
Conversion of wayleaves to easements, easements, injurious affection	Sub-Total		7.58	11.28
Diversion due to wayleave terminations	LV	Diversion completed	1.74	2.84
Diversion due to wayleave terminations	HV	Diversion completed	2.93	5.46
Diversion due to wayleave terminations	EHV	Diversion completed	1.08	2.06
Diversion due to wayleave terminations	132kV	Diversion completed	0.00	2.00
Diversion due to wayleave terminations	Sub-Total		5.75	12.36
Diversion for highways (funded as detailed in NRSWA)	LV	Diversion completed	-	-
Diversion for highways (funded as detailed in NRSWA)	HV	Diversion completed	2.29	2.82
Diversion for highways (funded as detailed in NRSWA)	EHV	Diversion completed	2.57	1.82
Diversion for highways (funded as detailed in NRSWA)	132kV	Diversion completed	-	-
Diversion for highways (funded as detailed in NRSWA)	Sub-Total		4.86	4.64
Total			18.18	28.28

- Source: Electricity North West Limited ED1 BPDT Final Investment Plan

The cost of executing these projects is £18.2 million which represents 3.6 percent of the entire investment expenditure during DPCR5. It is expected to increase to £28.3 million over the RIIO-ED1 period, indicating an increase of approximately 55 percent rise in direct costs.

2.1.3.1 Injurious Affection Claim

The combined increase in volumes of diversion projects related to “conversions of way leaves to easements, easements and injurious affection claims” comes under the Electricity North West Limited diversion programme. Over DPCR5, approximately £7.6 million was earmarked to deliver projects in this category. Over this period there has been approximately 130 claims

per annum resulting from perceived injurious affection of overhead circuits, particularly at 33kV and 132KV levels, over the last 3 years. We understand from the commentaries provided that these claims have risen as a result of Compensation agents inciting claims and an increase in diversionary works where opportunities to do so abound. We note that compensation payments vary in size but the increase in the number of claims put forward to Electricity North West Limited justifies the increase in volumes of projects and costs. We also view the increase in costs as an off-shoot of uncertainties surrounding unplanned costs and the magnitude of compensation claims made over this period.

2.1.3.2 Highway Diversions

The need to divert overhead cables along routes of major construction projects and in compliance to New Road and Street Works Act of 1991 underpins increases in this area. This category of projects accounts for 27 percent of the costs for diversionary works between 2010 and 2015. Increases in this area are the result of delivering projects that improve diverted electricity assets on the public highway and are driven by public sector infrastructure projects.

We assume that uncertainty surrounding size of infrastructure projects embarked on by developers and limitations to alternative cable and plant routes which could be adopted may in actual sense have contributed to increases in volume and intervention costs over this period. It also justifies why Electricity North West Limited envisages an approximate 115 percent increase in expenditure for projects in this category in RIIO-ED1, particularly in light of speculative 132kV overhead diversionary works stemming off from the proposed construction of the 3.6GW Nuclear power station at Cumbria

2.1.3.3 Wayleave Terminations

Electricity North West Limited has stated that termination of wayleaves typically come from requests made by developers to facilitate constructions work. Our observations for this category of diversion projects is quite similar to those highlighted in the injurious affection claims sections. The need to respond to requests for diversion of assets where Electricity North West Limited had not secured easements justifies the associated increases costs especially over the last three years.

We identify this programme as fundamentally customer driven.

2.2 Comparison of proposed volumes with those derived from independent modelling approaches

Parsons Brinckerhoff's 2012 report, "Review of RIIO-ED1 Submission for Electricity North West Limited", included an analysis of proposed volumes in RIIO-ED1 for a selected number of identified asset types. This analysis tested and evaluated Electricity North West Limited's justifications for expenditure and covered both CBRM and non-CBRM processes. The tests were run through a proprietary ageing model which served the purpose of a broad measure cross check of the results of the CBRM modelling.

Some of the assets tested were as follows:

- 6.6/11kV CB (GM) Primary (CBRM)
- 33kV Transformer (GM) (CBRM)
- 132kV CB (Air Insulated Outdoor) (CBRM)
- 6.6/11kV UG Cable
- 6.6kV RMU (CBRM)
- 132kV Transformer (CBRM)
- 6.6/11kV Switch (CBRM)
- LV Board (WM) (CBRM)
- 6.6/11kV Poles
- LV Poles

We have now reviewed Electricity North West Limited's revised investment plan for RIIO-ED1. Since our initial report, significant changes have been made to the investment plan and there has therefore been a shift in the hierarchy of assets in terms of proposed expenditure per replacement programme. The table below reflects Electricity North West Limited's revised investment plan for asset replacement programmes. These assets are listed in order of scale of expenditure in RIIO-ED1. However, only assets for which we had originally developed comments and recommendations in our last report will be considered in the following sections.

Overall, the 16 listed asset types above account for over 80 per cent of the total direct costs of the £389 million earmarked for replacement programmes in RIIO-ED1.

Proposed Volume Increases over DPCR5 into RIIO-ED1 for Asset Replacement Programme																		
Programme Category			DPCR5 Period					RIIO- ED1 Period							Volumes			
Asset Type	Asset Type	Voltage	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	DPCR5 (#)	RIIO-ED1 (#)	Increases (%)
33kV Transformer (GM)	EHV	Each	4	7	4	5	8	4	8	8	11	12	15	16	13	28	87	211%
6.6/11kV CB (GM) Primary	HV	Each	47	63	28	51	60	94	117	111	105	101	122	131	85	249	866	248%
33kV UG Cable (Non Pressurised)	EHV	Km	14	6	7	24	22	12	15	12	15	12	15	12	15	73	108	48%
132kV CB (Gas Insulated Busbars)(ID) (GM)	132kV	Each	-	-	-	-	2	9	-	10	1	8	-	-	7	2	35	1650%
6.6/11kV RMU	HV	Each	123	182	229	214	155	320	319	312	312	312	312	312	312	903	2,513	178%
6.6/11kV UG Cable	HV	Km	13	23	49	35	35	31	31	30	30	30	30	30	30	154	244	58%
6.6/11kV Transformer (GM)	HV	Each	158	139	134	190	125	90	90	90	90	263	263	263	263	746	1,412	89%
LV Main (UG Plastic)	LV	Km	30	19	20	13	13	25	25	25	25	25	25	25	25	94	200	113%
132kV Transformer	132kV	Each	-	2	3	2	12	2	1	1	2	3	2	4	2	19	17	-11%
132kV Tower	132kV	Each	13	22	35	70	7	25	25	25	25	25	25	25	25	147	200	36%
6.6/11kV Switch (GM)	HV	Each	21	41	87	131	112	317	317	317	317	317	317	317	317	392	2,536	547%
132kV UG Cable (Non Pressurised)	132kV	Km	1	7	4	21	7	2	2	2	1	1	1	1	1	40	12	-71%
6.6/11kV CB (GM) Secondary	HV	Each	31	53	63	122	96	158	157	157	157	157	157	157	157	365	1,257	244%
33kV Tower	EHV	Each	1	-	-	-	-	25	25	25	25	25	25	25	25	1	200	19900%
LV Pillar (OD at Substation)	LV	Each	63	76	105	189	189	111	111	111	111	111	111	111	111	622	891	43%
LV UGB & LV Pillars (OD not at Substation)	LV	Each	236	148	230	126	117	218	218	218	218	218	218	218	218	857	1,746	104%
132kV OHL (Tower Line) Conductor	132kV	Km	8	40	32	12	37	10	14	12	8	12	14	16	4	128	90	-30%
Cut Out (Metered)	LV	Each	7,381	8,624	9,977	7,355	7,135	6,311	5,911	5,511	5,112	5,112	4,712	3,913	3,913	40472	40494	0%
132kV Fittings	132kV	Each	39	456	120	510	120	343	343	343	343	343	343	343	343	1,245	2,742	120%
LV Board (WM)	LV	Each	1	12	24	54	91	49	49	49	49	49	49	49	49	182	393	116%

LV Service (UG)	LV	Each	890	1,041	638	292	292	624	624	624	624	624	624	624	624	624	3,153	4,994	58%
Pilot Wire Underground	Other	Km	1	1	0	9	3	12	12	12	12	12	12	12	12	12	13	96	611%
LV Poles	LV	Each	815	1,061	812	1,588	1,588	484	484	484	484	484	484	484	484	484	5,863	3,872	-34%
LV Pillar (ID)	LV	Each	66	21	34	49	49	70	70	70	70	70	70	70	70	70	218	558	156%
6.6/11kV OHL (Conventional Conductor)	HV	Km	7	6	6	3	2	30	30	30	30	30	30	30	30	30	24	238	882%
33kV CB (Gas Insulated Busbars)(ID) (GM)	EHV	Each	-	-	-	11	27	18	-	-	-	-	7	13	-	-	38	38	0%
33kV OHL (Pole Line) Conductor	EHV	Km	-	-	2	14	-	-	-	-	-	-	25	25	25	26	16	101	550%
LV Service (OHL)	LV	Each	1,355	887	415	1,443	1,443	931	931	931	931	931	931	931	931	931	5,543	7,448	34%
LV Main (OHL) Conductor	LV	Km	19	9	8	4	4	24	24	24	24	24	24	24	24	24	44	188	325%
Batteries at GM HV Substations	HV	Each	215	128	109	17	18	221	221	221	221	221	221	221	221	221	487	1,769	263%
6.6/11kV Poles	HV	Each	1,898	1,928	1,291	1,331	1,331	158	158	158	158	158	158	158	158	158	7,779	1,267	-84%
33kV Pole	EHV	Each	-	44	76	273	173	60	62	62	62	62	62	62	62	62	566	494	-13%
33kV Switch (GM)	EHV	Each	-	-	-	-	-	3	3	3	3	3	3	3	3	3	-	25	#DIV/0!
6.6/11kV Switchgear - Other (PM)	HV	Each	76	31	195	56	47	17	17	17	17	17	17	17	17	17	405	133	-67%
6.6/11kV Transformer (PM)	HV	Each	145	81	69	49	49	34	34	34	34	34	34	34	34	34	393	276	-30%
33kV Fittings	EHV		4	-	14	224	-	53	53	53	53	53	53	53	53	53	242	423	75%
HV Sub Cable	HV	Km	-	-	2	-	-	1	1	1	1	1	1	1	1	1	2	5	191%
Pilot Wire Overhead	Other	Km	-	14	15	30	18	2	2	2	2	2	2	2	2	3	78	17	-78%
33kV OHL (Tower line) Conductor	EHV	Km	-	-	-	15	-	-	3	-	-	-	-	-	-	-	15	3	-80%
LV Transformers/Regulators	LV	Each	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	15	100%

Source: Electricity North West; CV-3 Asset Replacement; ENWL_RIIO_ED1_Network_Investment_10Jun2013

2.2.1 33kV Transformer (GM)

Here PB observes a decrease in the forecast capital expenditure for total interventions in RIIO-ED1. This, however, comes with a revision in proposed volumes, down from 164 to 34. The revised multi-year average unit cost for RIIO-ED1 is £390,000. This in essence means a rise in projected multi-year average unit costs of approximately 49 percent from the previous forecast.

The PB ageing model gives a replacement of 132 units at a projected total direct cost of £49 million. This amounts to an average unit cost of £371,212 per intervention, indicating a 5.4 percent drop in margin compared to the expenditure in Electricity North West Limited's revised investment plan.

Electricity North West Limited's revised CBRM-generated volumes of planned interventions are now 34 percent lower than those derived through the PB ageing mode. It is believed that this is a consequence of Electricity North West Limited's identification and separation of plants that could have their life expectancies extended through undergoing remedial interventions such as transformer oil regeneration.

2.2.2 6.6/11kV CB (GM) Primary

Electricity North West Limited's revised volumes are 28.4 percent lower than those generated by the PB ageing model. This difference in the number of interventions can be connected to the decision to refurbish 358 units, which will effectively reduce the expected expenditure to £31million.

There is a reduction of approximately 39 percent in total direct costs from Electricity North West Limited's initial forecast.

Results from the Parsons Brinckerhoff ageing model test analysis reveal an improvement in proposed Electricity North West Limited total forecast unit costs by 8.3 percent.

2.2.3 6.6/11kV RMU

Electricity North West Limited's proposed volume is 99 percent above what was derived from our independent modelling process.

Proposed interventions have risen from 974 to 2,498, indicating an additional 61 percent replacement projects in RIIO-ED1. These increases support the decision to issue a Suspension of Operational Practice (SoP 2013/0383/00) on switchgears known to have a particular type of defect. The volumes have been revised based on a forecast from July 2012.

Parsons Brinckerhoff recognises that the increase in volumes is justifiable when safety and availability are considered. Proposed average unit costs 36 percent lower than those from the Parsons Brinckerhoff model reflects a replacement regimes that offers customers long term value for money when measured deliverable such as ESQCR are taken into account.

2.2.4 6.6/11kV UG Cable

Electricity North West Limited's proposed outputs have been revised down from 974 kilometres to 244 kilometres (this includes cables, associated ancillary and all termination equipments needing replacements in RIIO-ED1). This is a reduction of 75 percent.

This revised intervention figure is 73 percent lower than that generated by the Parsons Brinckerhoff ageing model. Where immediate interventions cannot be undertaken to replace these underground assets, Electricity North West Limited employ a risk attendant approach through applicable mitigation methods. This objective is anticipated to be achieved through an identified replacement strategy meant to span a period 32 years spread over four RIIO review periods..

Proposed RIIO-ED1 expenditure of £25 million is 8 percent higher than has been anticipated by the Parsons Brinckerhoff model process. While these percentage differences and outputs are comparable, we recommend that the effects of inflation and RPEs should be highlighted to Ofgem.

2.2.5 132kV Transformer

The revised volume for combined replacement and refurbishment interventions is now 31, down from the initial 33. Expenditure has been revised to £20 million to undertake a mix of both programmes, with the majority of intervention activities taking place under replacement projects at £19 million.

Although the forecasts are below our predicted projections, asset-life extension strategies represent only 5 percent of the intervention projects. We recommend that further details are specified in the business case supporting expenditure for refurbishment as more scrutiny from Ofgem is likely to surface on this aspect.

2.2.6 132kV Tower

Since our 2012 review the volumes of combined replacement and refurbishment programmes has increased from 636 to 3,456. This is an approximate 440 percent rise in proposed volumes. We assume that this sudden increase in volumes may be due to the previous data provided not being substantial enough to attain accurate outputs from CBRM.

Only 200 of the 3,456 projects forecast in RIIO-ED1 are refurbishment. We therefore believe there is a likelihood Ofgem may want to examine this more closely. However, we believe that the combined average unit cost, which is about 12 percent lower, will meet the regulator's approval and reduce the potential for scrutiny.

2.2.7 6.6/11kV Switch (GM)

Volumes of 6.6/11kV ground mounted switch units decrease by approximately 19 percent. Forecast volumes for the replacement programme are approximately 46% lower than those generated via the Parsons Brinckerhoff ageing model, reflecting a proficient scheme targeted at fuse switch units with particular defects.

Forecast capex 12.5 percent lower than the Parsons Brinckerhoff recommended value of £37.8 million suggests a cost effective strategy.

2.2.8 33kV Tower

Parsons Brinckerhoff's ageing model forecasts 307 total interventions at a cost of £12.5million. Electricity North West Limited's revised figures forecast 200 replacement projects and 364 refurbishment projects at a cost £14million. Projected average unit costs for intervention programmes are approximately 64 percent lower than those from the Parsons Brinckerhoff model. It is likely that the increase in proposed volumes for replacement is due to updated condition data collected in 2012 giving a truer picture. We believe no scrutiny will surface for this asset type.

2.2.9 Wall Mounted LV Boards

Revised proposed volumes are around 84 percent lower than Parsons Brinckerhoff's recommended volumes. This is due to more recent asset condition surveys undertaken to record accurate data into Ellipse, the Master Asset Management System (MAMS) which is Electricity North West Limited's asset register for LV switchgears categories.

£7million has been proposed for the delivery of replacement project activities. No commentary is given to suggest how a no-cost value has been reached for the refurbishing of 83 wall mounted units in RIIO-ED1. It is recommended that substantial commentary on the mode of delivering the refurbishment exercise is provided to justify the proposed capex in CV5 for this asset type.

2.2.10 LV Poles

Electricity North West Limited explains in its WJBP Commentary that it is practical to replace assets as they deteriorate. The total population of LV poles to undergo replacement and

refurbishment work is 15,593 units. Of this population, 48 percent will be replaced while the remaining 52 percent will undergo some form of restoration. The figure of 15,593 represents a drop of approximately 48 percent compared to the initial 30,075. This revised volume is 23.6 percent lower than what has been recommended via our independent modelling exercise.

The case made to justify this drop in expenditure levels is justified by the decision to combine replacement and refurbishment programmes, therefore maximising the benefits of investment on poles identified to be in most need of intervention.

We believe that no additional assessment of the investment plan proposed for this asset type will be undertaken by the regulator.

2.2.11 6.6/11kV Pole

Observations here are similar to those for LV Poles. Volumes captured for specific intervention in the asset register have been identified based on the policy for maintenance and refurbishment for overhead lines (CoP421). Of the population of 29,474 units to be addressed, 83 percent of proposed intervention activities fall under refurbishment programmes, representing the largest bulk of delivery activities proposed for this asset type in RIIO-ED1.

The revised forecast of interventions is approximately 30 percent higher than that of the Parsons Brinckerhoff ageing model. However, the total direct cost of £17 million is 75 percent lower. This suggests a more efficient delivery of intervention costs and we do not believe this will rouse further scrutiny.

However, we do recommend that Electricity North West Limited states in the business case that the cheaper cost of delivery of 6.6/11kV overhead pole line intervention projects is a consequence of a review of framework contract charges and comparison to other industry rates.

Composition Of Intervention Projects for Individual Asset Types								
Asset Type	Volumes/Interventions			Capital Expenditure			Programme Composition of Projects	
	RIIO-ED1 Replacement Volumes	RIIO-ED1 Refurbishment Volumes	RIIO-ED1: Total Volumes	RIIO-ED1 Replacement Direct Costs (£m)	RIIO-ED1 Refurbishment Direct Costs (£m)	RIIO-ED1: Total Expenditure (£M)	Replacement Programme (%)	Refurbishment Programme (%)
33kV Transformer (GM)	87	109	196	34	6	40	44.4	55.6
6.6/11kV CB (GM) Primary	866	358	1224	32	5	37	29.2	70.8
33kV UG Cable (Non Pressurised)	108	0	108	32	0	32	100	0
132kV CB (Gas Insulated Busbars)(ID) (GM)	35	8	43	28	0.16	28.16	81.4	18.6
6.6/11kV RMU	2498	-	2498	27	0	27	100	0
6.6/11kV UG Cable	244	-	244	25	-	25	100	0
6.6/11kV Transformer (GM)	1412	-	1412	19	-	19	100	0
LV Main (UG Plastic)	200	-	200	19	-	19	100	0
132kV Transformer	17	14	31	19	1	20	52	48
132kV Tower	200	1892	2092	16	31	47	9.6	90.4
6.6/11kV Switch (GM)	2536	-	2536	14	-	14	100	0
132kV UG Cable (Non Pressurised)	12	-	12	10	-	10	100	0
6.6/11kV CB (GM) Secondary	1257	70	1327	9	0.6	9.6	94.7	5.3
33kV Tower	200	364	564	8	6	14	35.5	64.5
LV Pillar (OD at Substation)	891	1474	2365	8	1	9	37.7	62.3
LV UGB & LV Pillars (OD not at Substation)	1746	-	1746	8	-	8	100	0
132kV OHL (Tower Line) Conductor	90	-	90	8	-	8	100	0

132kV Fittings	3142	-	3142	8	-	8	100	0
Cut Out (Metered)	40494	-	40494	8	-	8	100	0
LV Board (WM)	96	83	179	7	0	7	53.6	46.4
LV Service Underground	4994	-	4994	7	-	7	100	0
Pilot Wire Underground	96	-	96	5	-	5	100	0
LV Poles	3872	11721	15593	5	5	10	24.8	75.2
6.6/11kV Pole	1267	28207	29474	2	13	15	4.3	95.7
132kV CB (Air Insulated Busbars)(ID) (GM)	-	-	-	-	-	-	-	-

Source: Electricity North West Limited: CV3 and CV5 Tables; ENWL_RIIO_ED1_Network_Investment_10Jun2013

2.3 Justification of overall scale of capex and balance between programmes

Parsons Brinckerhoff has analysed the overall scale of Electricity North West Limited's proposed capex and the balance between its programmes, based on data provided within 'E_NWL_RIIO_ED1_Network_Investment_10Jun2013.xlsm'.

The programmes listed in the C10 table include five for which there are no values for either DPCR5 or RIIO-ED1 (Within Price Control, Transmission Connection Points, Operational IT & Telecoms, High Value Projects (ex ante) and High Impact Low Probability (HILP)). There are also no values for the category Demand and Pre 2005 DG Connections. These lines have been excluded from any analysis.

In this section we examine the balance between programmes in the RIIO-ED1 expenditure plan. In order to review this we have looked at the percentage of total capex allocated to each programme in RIIO-ED1, how these have changed compared to DPCR5 and whether they are justified properly in the narrative documents. We have also looked specifically at the ratios of expenditure between Asset Replacement and Refurbishment, Civil Works and Reinforcement.

2.3.1 Percentage of capex per programme

To assess the overall scale of capex and balance between programmes, it is useful to compare the RIIO-ED1 figures with those from DPCR5.

The table below summarises capex by programme across DPCR5 and RIIO-ED1: total spend, average spend per year and the percentage of total capex each category represents. The final three columns present the change in values between DPCR5 and RIIO-ED1.

The subsequent table provides the same data, grouped into categories.

£207.4M is allocated to High Value Projects (re-openers) during RIIO-ED1. There was zero expenditure in this programme during DPCR5. This expenditure covers work related to the proposed construction of a nuclear power station in Moorside in Cumbria. Given its large value and the uncertainty around the project, and the impact it has on overall conclusions on the scale of capex, we have also provided the same two tables as above with this value removed. *All analysis in this section 2.3 of the report is based on the High Value Projects (re-openers) being excluded.*

In all four tables, large changes (greater than 3%) in the percentage of total capex are in red text.

Summary of capex by Programme (including High Value Projects (re-openers))										
Gross Costs		DPCR5			RIIO-ED1			Change in		
Category	Programme	£M Total	£M Ave p/y	% of total capex	£M Total	£M Ave p/y	% of total capex	£M Total	£M Ave p/y	% of total capex
Core	Diversions	18.2	3.6	3.4%	28.3	3.5	2.7%	10.1	-0.1	-0.7%
Core	Reinforcement – General	82.1	16.4	15.4%	98.7	12.3	9.4%	16.5	-4.1	-6.0%
Core	Reinforcement - DSM Payments to avoid Reinforcement	0.3	0.1	0.0%	2.0	0.3	0.2%	1.7	0.2	0.1%
Core	Fault Level Reinforcement	2.6	0.5	0.5%	14.9	1.9	1.4%	12.3	1.3	0.9%
Core	ESQCR	29.3	5.9	5.5%	-	0.0	0.0%	-29.3	-5.9	-5.5%
Core	Asset Replacement	240.2	48.0	45.1%	389.0	48.6	37.2%	148.8	0.6	-7.9%
Core	Refurbishment	44.5	8.9	8.4%	112.1	14.0	10.7%	67.6	5.1	2.4%
Core	Civil Works	26.4	5.3	4.9%	79.2	9.9	7.6%	52.8	4.6	2.6%
Core	Legal and Safety	13.9	2.8	2.6%	41.4	5.2	4.0%	27.6	2.4	1.4%
Core	QoS	30.0	6.0	5.6%	-	0.0	0.0%	-30.0	-6.0	-5.6%
Core	High Value Projects (re-openers)	-	-	0.0%	207.4	25.9	19.8%	207.4	25.9	19.8%
Non Core	Flooding	7.9	1.6	1.5%	10.3	1.3	1.0%	2.4	-0.3	-0.5%
Non Core	BT21CN	22.7	-	4.3%	-	0.0	0.0%	-22.7	0.0	-4.3%
Non Core	Technical losses	-	-	0.0%	10.0	1.3	1.0%	10.0	1.3	1.0%
Non Core	Environmental	3.1	0.6	0.6%	6.7	0.8	0.6%	3.6	0.2	0.1%
Non Core	CNI	-	-	0.0%	2.6	0.3	0.2%	2.6	0.3	0.2%
Non Core	Black Start	-	-	0.0%	14.7	1.8	1.4%	14.7	1.8	1.4%
Non Core	Rising mains and laterals	3.0	0.6	0.6%	16.9	2.1	1.6%	13.9	1.5	1.0%
Stand Alone Funding (RAV)	Undergrounding Within/ Outside designated areas	6.1	1.2	1.1%	9.0	1.1	0.9%	2.9	-0.1	-0.3%
Stand Alone Funding (RAV)	Worst Served Customers	2.2	0.4	0.4%	3.4	0.4	0.3%	1.1	0.0	-0.1%
Total		532.4	106.5	100.0%	1,046.5	130.8	100.0%	514.1	24.3	0.0%

Summary of capex by Category (including High Value Projects (re-openers))									
Gross Costs Category	DPCR5			RIIO-ED1			Change in		
	£M Total	£M Ave p/y	% of total capex	£M Total	£M Ave p/y	% of total capex	£M Total	£M Ave p/y	% of total capex
Core	487.4	97.5	91.5%	973.0	121.6	93.0%	485.6	24.2	1.4%
Non Core	36.7	7.3	6.9%	61.2	7.6	5.8%	24.4	0.3	-1.1%
Stand Alone Funding (RAV)	8.3	1.7	1.6%	12.4	1.5	1.2%	4.0	-0.1	-0.4%
Total	532.4	106.5	100.0%	1,046.5	130.8	100.0%	514.1	24.3	0.0%

Summary of capex by Programme (excluding High Value Projects (re-openers))										
Gross Costs		DPCR5			RIIO-ED1			Change in		
Category	Programme	£M Total	£M Ave p/y	% of total capex	£M Total	£M Ave p/y	% of total capex	£M Total	£M Ave p/y	% of total capex
Core	Diversions	18.2	3.6	3.4%	28.3	3.5	3.4%	10.1	-0.1	0.0%
Core	Reinforcement – General	82.1	16.4	15.4%	98.7	12.3	11.8%	16.5	-4.1	-3.7%
Core	Reinforcement - DSM Payments to avoid Reinforcement	0.3	0.1	0.0%	2.0	0.3	0.2%	1.7	0.2	0.2%
Core	Fault Level Reinforcement	2.6	0.5	0.5%	14.9	1.9	1.8%	12.3	1.3	1.3%
Core	ESQCR	29.3	5.9	5.5%	-	0.0	0.0%	-29.3	-5.9	-5.5%
Core	Asset Replacement	240.2	48.0	45.1%	389.0	48.6	46.4%	148.8	0.6	1.3%
Core	Refurbishment	44.5	8.9	8.4%	112.1	14.0	13.4%	67.6	5.1	5.0%
Core	Civil Works	26.4	5.3	4.9%	79.2	9.9	9.4%	52.8	4.6	4.5%
Core	Legal and Safety	13.9	2.8	2.6%	41.4	5.2	4.9%	27.6	2.4	2.3%
Core	QoS	18.2	3.6	3.4%	28.3	3.5	3.4%	10.1	-0.1	0.0%
Core	High Value Projects (re-openers)									
Non Core	Flooding	7.9	1.6	1.5%	10.3	1.3	1.2%	2.4	-0.3	-0.3%
Non Core	BT21CN	22.7	-	4.3%	-	0.0	0.0%	-22.7	0.0	-4.3%
Non Core	Technical losses	-	-	0.0%	10.0	1.3	1.2%	10.0	1.3	1.2%
Non Core	Environmental	3.1	0.6	0.6%	6.7	0.8	0.8%	3.6	0.2	0.2%
Non Core	CNI	-	-	0.0%	2.6	0.3	0.3%	2.6	0.3	0.3%
Non Core	Black Start	-	-	0.0%	14.7	1.8	1.8%	14.7	1.8	1.8%
Non Core	Rising mains and laterals	3.0	0.6	0.6%	16.9	2.1	2.0%	13.9	1.5	1.4%
Stand Alone Funding (RAV)	Undergrounding Within/ Outside designated areas	6.1	1.2	1.1%	9.0	1.1	1.1%	2.9	-0.1	-0.1%
Stand Alone Funding (RAV)	Worst Served Customers	2.2	0.4	0.4%	3.4	0.4	0.4%	1.1	0.0	0.0%
Total		532.4	106.5	100.0%	839.0	104.9	100.0%	306.6	-1.6	0.0%

Summary of capex by Category (excluding High Value Projects (re-openers))									
Gross Costs Category	DPCR5			RIIO-ED1			Change in		
	£M Total	£M Ave p/y	% of total capex	£M Total	£M Ave p/y	% of total capex	£M Total	£M Ave p/y	% of total capex
Core	487.4	97.5	91.5%	765.5	95.7	91.2%	278.2	-1.8	-0.3%
Non Core	36.7	7.3	6.9%	61.2	7.6	7.3%	24.4	0.3	0.4%
Stand Alone Funding (RAV)	8.3	1.7	1.6%	12.4	1.5	1.5%	4.0	-0.1	-0.1%
Total	532.4	106.5	100.0%	839.0	104.9	100.0%	306.6	-1.6	0.0%

2.3.2 Categories

Across both price control periods, Core costs represent the vast majority of capex (£487.4M or 91.5% for DPCR5 and £765.5M or 91.2% for RIIO-ED1).

Non-Core costs increase slightly from 6.9% of total capex (£36.7M) during DPCR5 to 7.3% (£61.2M) during RIIO-ED1.

Stand Alone Funding (RAV) accounted for 1.6% of total capex during DPCR5 (£8.3M) but decreases in percentage terms to 1.5% for RIIO-ED1 (£12.4M).

2.3.3 Programmes

There are five programmes for which the percentage of total capex figure changes significantly (by more than 3%):

2.3.3.1 Reinforcement - General

15.4% of total capex (£82.1M) in DPCR5 and 11.8% of capex (£98.7M) in RIIO-ED1.

The Reinforcement sections of '130528 BPDT Commentary v2_draft.docx' are empty. We were, however, provided with 'C12 Commentary V2.docx', which outlines Electricity North West Limited's Reinforcement programme, although this document was incomplete (for example, there is a note on pp.6 to add a section on voltage and harmonic outputs and on pp.7 there are figures missing).

The methodology of developing and pricing Reinforcement expenditure forecasts is explained in detail.

In 2012, Cambridge Economic Policy Associates (CEPA) was commissioned to produce an energy forecast to 2023, and this was updated in January 2013. Parsons Brinckerhoff believes that it is positive that independent experts have been recruited to assist with this process.

Further, Electricity North West Limited's own model, the Future Capacity Headroom model, and its use, is explained. We recommend that it should be ensured that the added value of using this model is made clear.

On pp.7, it is stated that Ofgem's regional Transform model is customised by Electricity North West Limited. It isn't clear what this customisation involves and we recommend that this be made explicit

Six Reinforcement expenditure forecasts have been produced: four low-carbon scenarios from DECC; a base forecast without significant penetration of low-carbon technologies; and a sixth scenario including the connection of a nuclear power station at Moorside. We believe that it could be made clearer which forecast is being used as the basis for the investment figures.

2.3.3.2 ESQCR

DPCR5 saw 5.5% of capex (£29.3M) spent on this programme. There is no spending forecast on ESQCR during RIIO-ED1 as Electricity North West Limited expects that all such overhead line clearance compliance will be completed during DPCR5.

2.3.3.3 Refurbishment

Refurbishment sees the biggest increase in terms of percentage of total capex of any programme (5%). In DPCR5 8.4% of total capex (£44.5M) was spent on Refurbishment; in RIIO-ED1 it is 13.4% (£112.1M).

The WJBP explains that Cost Benefit Analysis is carried out on major asset types. Spending on refurbishment comes out of this analysis, along with use of CBRM tools. Our review of the CBAs is contained in section 5 of this report.

2.3.3.4 Civil Works

4.9% of total capex (£26.4M) in DPCR5 and 9.4% (£79.2M) in RIIO-ED1.

Increases in civil works costs have been identified within the WJBP as being down to:

- Increases associated with additional plant volumes;
- New major programmes of work on cable structures (pits, tunnels and bridges); and
- Increase in Grid and Primary works (e.g. substation dehumidifier upgrades instigated following a number of plant failures due to moisture ingress).

2.3.3.5 BT21CN

This represents 4.3% of total capex (£22.7M) in DPCR5 but has zero expenditure associated with it in RIIO-ED1.

This is BT's 21st Century Networks initiative and there is no spending forecast in RIIO-ED1. The commentary (pp.70) explains that "BT21CN is a high value project, separately funded

from the Network Investment and Operational IT Programmes. Expenditure thus far has been in line with the delivery profile.”

From the narrative documents, it is not clear why there is now zero expenditure forecast and we recommend that this be made explicit.

2.3.4 Ratios

Here we directly compare the ratio of expenditure between different programmes.

In this commentary, the ratios are presented as described below:

- *Price control period: Asset Replacement: Comparison category - Ratio*

2.3.4.1 Asset Replacement against Refurbishment

The ratios for spending between Asset Replacement and Refurbishment for DPCR5 and RIIO-ED1 are presented below.

- DPCR5: £240.2M:£44.5M - 5.4:1
- RIIO-ED1: £389.0M:£112.1M - 3.5:1

The ratio of Asset Replacement expenditure to expenditure on Refurbishment has decreased from 5.4:1 to 3.5:1.

This suggests a greater emphasis on refurbishing assets rather than replacing them and we believe this should not be of concern to Ofgem.

A policy of refurbishing rather than replacing, and therefore a change from the DPCR5 approach, should be clearly explained in the supporting documents.

2.3.4.2 Asset Replacement against Civil Works

The ratios for spending between Asset Replacement and Civil Works for DPCR5 and RIIO-ED1 are presented below.

- DPCR5: £240.2M:£26.4M - 9.1:1
- RIIO-ED1: £389.0M:£79.2M - 4.9:1

The ratio of Asset Replacement expenditure to expenditure on Civil Works has decreased from 9.3:1 to 4.9:1. Increases in spending on Civil Works have been explained in the previous section.

2.3.4.3 Asset Replacement against Reinforcement

Expenditure on Reinforcement is split between General and DSM Payments to avoid Reinforcement. The figures below are the total of these two.

- DPCR5: £240.2M:£82.4 - 2.9:1
- RIIO-ED1: £389.0M:£100.7M - 3.9:1

The ratio of Asset Replacement expenditure to expenditure on Reinforcement has increased from 2.9:1 to 3.9:1.

2.4 Parsons Brinckerhoff conclusion

It is noticeable that the percentage of total capex figures are very similar between DPCR5 and RIIO-ED1.

There are five programmes for which the percentage of total capex figures are, by our judgement, significantly different. Two of these (ESQCR and BT21CN) are due to there being zero expenditure forecast for RIIO-ED1. The reason for zero expenditure on BT21CN should be explained clearly. The figures for the remaining programmes (Reinforcement - General, Refurbishment and Civil Works) are explained and justified through the narrative documents.

At the category level, the differences are very small. The biggest change is in Non-Core, which has increased from 6.9% to 7.3%.

There is nothing in these figures that we feel will be of particular concern to Ofgem.

The ratios we have examined, show that the ratio of Asset Replacement to Refurbishment and Civil Works have decreased, while the ratio of Asset Replacement to Reinforcement has increased.

Again, we feel that nothing here will be of concern to Ofgem.

Our recommendations are:

- Complete the reinforcement commentary

- Explain the benefits of the Future Headroom Capacity model
- Explain how the Transform model is customised
- State more clearly which forecast has been used as the basis for investment figures
- Explain why there is zero expenditure forecast for BT21CN
- Explain further any policy on refurbishment versus replacement (or reinforcement versus replacement)

3 LINKAGE TO OUTPUTS

Ofgem has determined a number of outputs which the distribution companies must seek to attain in the RIIO-ED1 period. Some of these will be statutory (e.g. health and safety requirements) while companies will be incentivised to attain others through financial penalties and rewards.

For each output category the rationale and justification for the expenditure will need to be developed in the Well Justified Business Plan.

Parsons Brinckerhoff has reviewed Electricity North West Limited's draft WJBP with regard to outputs. Our review sought to answer the following questions as set out in the scope of our work:

- Has Electricity North West Limited clearly identified the outputs that the investment will deliver?
- Has Electricity North West Limited articulated the benefit that it expects?
- Has Electricity North West Limited supported the choice of target appropriately?
- Do the projections appear to represent an efficient forecast?

In answering the first three of these questions Parsons Brinckerhoff has examined each of the outputs in-turn and assessed the WJBP description on a check-list basis. In answering the final question we have relied on our experience in assessing efficiency generally. In order to undertake a comprehensive review of efficiency we would need access to comparative cost data from other DNOs. This data is unavailable and we therefore regard a full efficiency test as outside the scope of this work. Instead we provide our own opinion where possible.

3.1 Safety

Electricity North West Limited is mandated to comply with all applicable legislation with regard to health and safety and Ofgem has not established a separate incentive scheme for this output measure. Investment to reduce specific safety risk is aimed at the following areas:

- Asbestos management
- Safe climbing
- Site security

Parsons Brinckerhoff believes that Electricity North West Limited has clearly identified the outputs which its investment will deliver. The commentary in the WJBP explains the outputs in relation to site security, tower climbing, asbestos management, training and education.

While we understand that the WJBP is targeted at a general audience and does not contain detailed analysis of every level of expenditure we found the section on security to be quite vague in terms of the actual expenditure items to improve security. We recommend that the analysis in the annexes should contain more detailed information. In some cases the description does not include the number of assets or the level of expenditure being proposed for RIIO-ED1. This is particularly true for the site security expenditure category. Only in Table 5.3.2 is there a one line expenditure item but this is not broken down into the four output categories.

Under Tower Climbing a target of 3,000 Latchway Systems installations has been identified by 2023. We would recommend that Electricity North West Limited explains how this target has been set and what the effects would be in terms of costs / benefits of an accelerated or delayed programme.

Similarly, the asbestos management programme mentions the number of asbestos removals at both high and low risk sub stations. We recommend that the justification for these targets is made explicit.

Given the lack of information relating to the expenditure on safety it has not been possible to comment on whether the expenditure forecasts can be considered efficient.

Checklist questions	Comments
Outputs identified?	Outputs partially identified, actual numbers needed for some categories
Benefit articulated?	In general terms only
Target level supported?	No
Are projections efficient?	Not enough information to answer

3.2 Social Obligations

This output relates to expenditure targeted at vulnerable customers and wider social obligations. Electricity North West Limited has a targeted corporate social responsibility index scoring.

Electricity North West Limited maintains a priority services register (PSR) to identify those customers most dependent on its services. PSR customers receive priority support during power cuts.

To achieve its outputs Electricity North West Limited intends to invest its own funds in comprehensive data systems and customer support communication. Electricity North West Limited has committed £1m per annum during RIIO-ED1 for these measures.

Electricity North West Limited has identified areas of high concentration of vulnerable customers and it intends to spend £0.6m in the first 2 years of RIIO-ED1 to make the network more reliable. Extra funding will be targeted at improving reliability at sub-stations in areas of high vulnerable customer concentration.

Electricity North West Limited’s data strategy will help to identify those customers in fuel poverty

3.2.1 Parsons Brinckerhoff review:

We believe that the WJBP describes adequately those areas where Electricity North West Limited plans to spend money on but the outputs of that expenditure are rather tenuous in some cases. Targets for the outputs are not always clear and it will therefore be difficult to measure if the targets have been met or not.

We believe that the analysis would benefit from the inclusion of specific measureable targets during RIIO-ED1 including for example, number of new and existing customer service staff to be trained.

Targets and expenditure are more explicit for the resilient supplies to vulnerable locations category and for reducing fuel poverty by reducing the overall level of prices.

Checklist questions	Comments
Outputs identified?	Outputs partially identified, actual numbers needed for some categories
Benefit articulated?	In some categories
Target level supported?	In some categories
Are projections efficient?	Not enough information to answer

3.3 Reliability and Availability

The WJBP states that reliability (power cuts) and availability (time without power) are the two key measures of network performance that customers experience most directly. To meet Ofgem targets for CIs and CMLs, Electricity North West Limited has a targeted asset replacement programme, additional remote control and automation programmes and new techniques and processes to improve fault restoration.

Electricity North West Limited has identified targets for output performance in the following areas:

- Quality of Supply
- Worst-served customers
- Network resilience
- Asset Health
- Asset Loading

3.3.1 Parsons Brinckerhoff Comments:

Electricity North West Limited has clearly identified the outputs which the investment is designed to deliver in every one of the above categories. The targets set are measurable and infer a direct benefit to customers.

Investment to meet the outputs has been identified and justified in section 5 of the WJBP.

We recommend that the CBAs undertaken by Electricity North West Limited reflect a range of options considered and that the preferred option which is most beneficial in improving reliability and availability is mapped back to this section.

Checklist questions	Comments
Outputs identified?	Yes
Benefit articulated?	Yes
Target level supported?	Yes
Are projections efficient?	Assumed given historical investment levels

3.4 Customer Satisfaction

This output consists of three categories: a customer satisfaction survey; complaints resolution and stakeholder engagement.

3.4.1 Parsons Brinckerhoff Comments:

We believe that Electricity North West Limited has adequately identified the outputs it wishes to deliver in this category. Measuring the benefits to customers is not very easy for some of these such as undertaking a satisfaction survey or greater stakeholder engagement. For this reason it is also difficult to set targets.

We agree that targets should be set for complaints resolution both for reducing the number of complaints and for reducing the time taken to solve complaints. However the rationale for the new target level has not been explained – it would be useful if Electricity North West Limited could provide some evidence that its new targets are in line with best industry practice.

Finally, no expenditure levels have been identified to specifically meet these output objectives and therefore an efficiency assessment is not possible.

Checklist questions	Comments
Outputs identified?	Yes
Benefit articulated?	Yes
Target level supported?	Only for complaints resolution
Are projections efficient?	Not possible to assess

3.5 Connections

We believe that the explanation of this output measure needs to be developed more fully in the (draft) WJBP.

The output measures here include compliance with full competition regulations for connections, connection cost quotation times (with a number of working days), connection completion times (working days) and guaranteed standards incentives.

Electricity North West Limited has identified measurable targets for these but the justification of the target levels has not been established. No linkage to expenditure has been established.

Checklist questions	Comments
Outputs identified?	Yes
Benefit articulated?	No
Target level supported?	No rationale for target levels
Are projections efficient?	Not possible to assess

3.6 Environmental Impact

Output measures in this category refer to Electricity North West Limited’s own Business Carbon Footprint (reducing carbon emissions from own activities), Oil Leakages, and Undergrounding of overhead lines and losses reduction.

Electricity North West Limited has established a target for each of these outputs. In the case of undergrounding cables a length of km measure is targeted while for the others there is a reduction in emissions, litres leaked or MWh losses saved.

For the oil leakage and loss reduction output targets, the target has been substantiated by a CBA. Undergrounding has been informed by customer feedback. However, the rationale for the 10% reduction in carbon footprint should also be explained.

Checklist questions	Comments
Outputs identified?	Yes
Benefit articulated?	Yes
Target level supported?	Yes (except carbon footprint)
Are projections efficient?	Yes by CBAs