

CBA Option 1 Replacement with cheapest available unit yr 1

Term (years from first out flow)	NPV (£m)
16	£0.01
24	£0.05
32	£0.08
45	£0.11

first year of investment out flow |

Calculation	Units	RIIO-ED1								RIIO-ED2								RIIO-ED3							
		1 2016	2 2017	3 2018	4 2019	5 2020	6 2021	7 2022	8 2023	9 2024	10 2025	11 2026	12 2027	13 2028	14 2029	15 2030	16 2031	17 2032	18 2033	19 2034	20 2035	21 2036	22 2037	23 2038	24 2039
Investment																									
Asset Replacement	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total investment	£m																								
Avoided DNO costs																									
Inspections & Maintenance	£m																								
Asset Replacement	£m																								
Refurbishment	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total avoided DNO costs	£m																								
Total DNO net benefits before capitalisation	(1) = investment + DNO benefits £m																								
Capitalisation rates	(2) %	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Capitalised investment	(3)=(1)x(2) £m																								
Investment to be expensed	(4)=(1)-(3) £m																								
Depreciation	(5)=Σ(5) £m																								
Cost of Capital	(6)=avg[(6 ^{cl}),(6 ^{op})]xWACC £m																								
Total Net DNO benefits	(7)=(4)+(5)+(6) £m																								
Societal benefits (£m) i.e. costs avoided																									
Losses	£m																								
CO2e associated with losses	£m																								
Customer interruptions (CI)	£m																								
Customer minutes lost (CML)	£m																								
Other GHG emissions (CO2e) i.e. not associated with losses	£m																								
Fatality	£m																								
Major injury	£m																								
Oil leakage	£m																								
Other 1 (specify)	£m																								
Other 2 (specify)	£m																								
Other 3 (specify)	£m																								
Total societal net benefits	£m																								
Net benefits	£m																								
Discount factor	=1/[(1+SRTP)^n]	0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.47	0.45	0.44
Discount factor (safety)	=1/[(1+PTPR)^n]	0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72	0.71	0.70
Discounted net benefits	£m																								
Cumulative discounted net benefits	£m																								

Non-DNO (eg societal) benefits	
Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.	
Societal net benefits (impact relative to business as usual scenario)	MWh
Reduced losses	
Reduced emissions associated with losses	tCO2e
Reduced number of customers interrupted	no.
Reduced customer minutes lost	Mins
Reduced emissions (not associated with losses) ¹	tCO2e
Reduced probability of fatality ²	%
Reduced probability of major injury ²	%
Reduced oil leakage	Litres

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors
<http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
 Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
 All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpccheck.htm>

CBA Option 1.1 Sensitivity check: Option 1 with 5yr refurb life extension

Term (years from first out flow)	NPV (£m)
16	£0.10
24	£0.14
32	£0.16
45	£0.19

first year of investment out flow |

Calculation	Units	RIIO-ED1								RIIO-ED2								RIIO-ED3							
		1 2016	2 2017	3 2018	4 2019	5 2020	6 2021	7 2022	8 2023	9 2024	10 2025	11 2026	12 2027	13 2028	14 2029	15 2030	16 2031	17 2032	18 2033	19 2034	20 2035	21 2036	22 2037	23 2038	24 2039
Investment																									
Asset Replacement	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total investment	£m																								
Avoided DNO costs																									
Inspections & Maintenance	£m																								
Asset Replacement	£m																								
Refurbishment	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total avoided DNO costs	£m																								
Total DNO net benefits before capitalisation	£m																								
(1) = investment + DNO benefits																									
Capitalisation rates	%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Capitalised investment	£m																								
(3)=(1)x(2)																									
Investment to be expensed	£m																								
(4)=(1)-(3)																									
Depreciation	£m																								
(5)=Σ(5) _t																									
Cost of Capital	£m																								
(6)=avg[(6 ^{cl}),(6 ^{op})]xWACC																									
Total Net DNO benefits	£m																								
(7)=(4)+(5)+(6)																									
Societal benefits (£m) i.e. costs avoided																									
Losses	£m																								
CO2e associated with losses	£m																								
Customer interruptions (CI)	£m																								
Customer minutes lost (CML)	£m																								
Other GHG emissions (CO2e) i.e. not associated with losses	£m																								
Fatality	£m																								
Major injury	£m																								
Oil leakage	£m																								
Other 1 (specify)	£m																								
Other 2 (specify)	£m																								
Other 3 (specify)	£m																								
Total societal net benefits	£m																								
Net benefits	£m																								
Discount factor																									
=1/[(1+SRTP)^n]																									
Discount factor (safety)																									
=1/[(1+PTPR)^n]																									
Discounted net benefits	£m																								
Cumulative discounted net benefits	£m																								

Non-DNO (eg societal) benefits		Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																							
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh																							
	Reduced emissions associated with losses	tCO2e																							
	Reduced number of customers interrupted	no.																							
	Reduced customer minutes lost	Mins																							
	Reduced emissions (not associated with losses) ¹	tCO2e																							
	Reduced probability of fatality ²	%																							
	Reduced probability of major injury ²	%																							
Reduced oil leakage	Litres																								

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors
<http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
 Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
 All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpcheck.htm>

CBA Option 1.2 **Sensitivity check: Option 1 with a 3yr refurb life extension**

Term (years from first out flow)	NPV (£m)
16	£0.14
24	£0.18
32	£0.20
45	£0.23

first year of investment out flow |

Calculation	Units	RIIO-ED1								RIIO-ED2								RIIO-ED3							
		1 2016	2 2017	3 2018	4 2019	5 2020	6 2021	7 2022	8 2023	9 2024	10 2025	11 2026	12 2027	13 2028	14 2029	15 2030	16 2031	17 2032	18 2033	19 2034	20 2035	21 2036	22 2037	23 2038	24 2039
Investment																									
Asset Replacement	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total investment	£m																								
Avoided DNO costs																									
Inspections & Maintenance	£m																								
Asset Replacement	£m																								
Refurbishment	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total avoided DNO costs	£m																								
Total DNO net benefits before capitalisation	(1) = investment + DNO benefits	£m																							
Capitalisation rates	(2)	%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Capitalised investment	(3)=(1)x(2)	£m																							
Investment to be expensed	(4)=(1)-(3)	£m																							
Depreciation	(5)=Σ(5) _t	£m		(0.00)	(0.00)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Cost of Capital	(6)=avg[(6 ^{cl}),(6 ^{op})]xWACC	£m	(0.00)	(0.01)	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	
Total Net DNO benefits	(7)=(4)+(5)+(6)	£m	(0.08)	(0.01)	0.14	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Societal benefits (£m) i.e. costs avoided																									
Losses	£m																								
CO2e associated with losses	£m																								
Customer interruptions (CI)	£m																								
Customer minutes lost (CML)	£m																								
Other GHG emissions (CO2e) i.e. not associated with losses	£m																								
Fatality	£m																								
Major injury	£m																								
Oil leakage	£m																								
Other 1 (specify)	£m																								
Other 2 (specify)	£m																								
Other 3 (specify)	£m																								
Total societal net benefits	£m																								
Net benefits	£m		(0.08)	(0.01)	0.14	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Discount factor	=1/[(1+SRTP)^n]		0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.47	
Discount factor (safety)	=1/[(1+PTPR)^n]		0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72	
Discounted net benefits		£m	(0.07)	(0.01)	0.13	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
Cumulative discounted net benefits		£m	(0.07)	(0.08)	0.05	0.06	0.07	0.07	0.08	0.09	0.10	0.11	0.11	0.12	0.13	0.13	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17	

Non-DNO (eg societal) benefits		Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																							
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh																							
	Reduced emissions associated with losses	tCO2e																							
	Reduced number of customers interrupted	no.																							
	Reduced customer minutes lost	Mins																							
	Reduced emissions (not associated with losses) ¹	tCO2e																							
	Reduced probability of fatality ²	%																							
	Reduced probability of major injury ²	%																							
	Reduced oil leakage	Litres																							

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors
<http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
 Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
 All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpccheck.htm>

CBA Option 1.3 **Sensitivity check: Option 1 with 15yr refurb life extension**

Term (years from first out flow)	NPV (£m)
16	-£0.08
24	-£0.03
32	£0.01
45	£0.05

first year of investment out flow I

			RIIO-ED1								RIIO-ED2								RIIO-ED3							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Investment	Asset Replacement	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Total investment	£m																								
Avoided DNO costs	Inspections & Maintenance	£m																								
	Asset Replacement	£m																								
	Refurbishment	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
Total avoided DNO costs	£m																									
Total DNO net benefits before capitalisation	(1) = investment + DNO benefits	£m																								
Capitalisation rates	(2)	%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%		
Capitalised investment	(3)=(1)x(2)	£m																								
Investment to be expensed	(4)=(1)-(3)	£m																								
Depreciation	(5)=Σ(5) _t	£m		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cost of Capital	(6)=avg[(6) ^{cl} , (6) ^{op}]]xWACC	£m	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Total Net DNO benefits	(7)=(4)+(5)+(6)	£m	(0.08)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.15	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Societal benefits (£m) i.e. costs avoided	Losses	£m																								
	CO2e associated with losses	£m																								
	Customer interruptions (CI)	£m																								
	Customer minutes lost (CML)	£m																								
	Other GHG emissions (CO2e) i.e. not associated with losses	£m																								
	Fatality	£m																								
	Major injury	£m																								
	Oil leakage	£m																								
	Other 1 (specify)	£m																								
	Other 2 (specify)	£m																								
	Other 3 (specify)	£m																								
	Total societal net benefits		£m																							
	Net benefits		£m	(0.08)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.15	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Discount factor	=1/[(1+SRTP)^n]		0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.47		
Discount factor (safety)	=1/[(1+PTPR)^n]		0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72		
Discounted net benefits		£m	(0.07)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.09	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Cumulative discounted net benefits		£m	(0.07)	(0.08)	(0.09)	(0.10)	(0.11)	(0.12)	(0.13)	(0.14)	(0.14)	(0.15)	(0.16)	(0.16)	(0.17)	(0.17)	(0.09)	(0.08)	(0.07)	(0.07)	(0.06)	(0.05)	(0.05)	(0.04)		

Non-DNO (eg societal) benefits		
Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.		
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh
	Reduced emissions associated with losses	tCO2e
	Reduced number of customers interrupted	no.
	Reduced customer minutes lost	Mins
	Reduced emissions (not associated with losses) ¹	tCO2e
	Reduced probability of fatality ²	%
	Reduced probability of major injury ²	%
	Reduced oil leakage	Litres

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors
<http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
 Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
 All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpccheck.htm>

CBA Option 2 Replacement in year 1 with capitalised loss unit (current policy) vs baseline

Term (years from first out flow)	NPV (£m)
16	£0.06
24	£0.16
32	£0.23
45	£0.31

first year of investment out flow |

			RIIO-ED1								RIIO-ED2								RIIO-ED3							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Investment	Asset Replacement	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Total investment	£m																								
Avoided DNO costs	Inspections & Maintenance	£m																								
	Asset Replacement	£m																								
	Refurbishment	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
Total avoided DNO costs	£m																									
Total DNO net benefits before capitalisation (1) = investment + DNO benefits			£m																							
Capitalisation rates (2)			%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	
Capitalised investment (3)=(1)x(2)			£m																							
Investment to be expensed (4)=(1)-(3)			£m																							
Depreciation (5)=Σ(5) _t			£m		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Cost of Capital (6)=avg[(6 ^{cl}),(6 ^{op})]xWACC			£m	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Total Net DNO benefits (7)=(4)+(5)+(6)			£m	(0.13)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	0.14	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Societal benefits (£m) i.e. costs avoided	Losses	£m		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
	CO2e associated with losses	£m		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
	Customer interruptions (CI)	£m																								
	Customer minutes lost (CML)	£m																								
	Other GHG emissions (CO2e) i.e. not associated with losses	£m																								
	Fatality	£m																								
	Major injury	£m																								
	Oil leakage	£m																								
	Other 1 (specify)	£m																								
	Other 2 (specify)	£m																								
	Other 3 (specify)	£m																								
	Total societal net benefits			£m	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
	Net benefits			£m	(0.13)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	0.00	0.16	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.02	
Discount factor =1/[(1+SRTP)^n]				0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49		
Discount factor (safety) =1/[(1+PTPR)^n]				0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73		
Discounted net benefits			£m	(0.12)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	0.00	0.11	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Cumulative discounted net benefits			£m	(0.12)	(0.13)	(0.13)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.03)	(0.02)	(0.00)	0.02	0.03	0.05	0.06	0.07	0.09	0.10	0.11	0.13		

Non-DNO (eg societal) benefits																								
Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																								
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263
	Reduced emissions associated with losses	tCO2e	-	128.44	124.62	120.81	117.00	113.19	109.37	105.56	101.75	97.94	94.13	90.31	86.50	82.69	78.88	75.06	71.25	67.44	63.63	59.81	56.00	52.19
	Reduced number of customers interrupted	no.																						
	Reduced customer minutes lost	Mins																						
	Reduced emissions (not associated with losses) ¹	tCO2e																						
	Reduced probability of fatality ²	%																						
	Reduced probability of major injury ²	%																						
	Reduced oil leakage	Litres																						

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors <http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpccheck.htm>

CBA Option 2.1 Sensitivity check: Option 2 with 5yr refurb life extension

Term (years from first out flow)	NPV (£m)
16	£0.16
24	£0.25
32	£0.32
45	£0.38

first year of investment out flow |

Calculation	Units	RIIO-ED1								RIIO-ED2								RIIO-ED3							
		1 2016	2 2017	3 2018	4 2019	5 2020	6 2021	7 2022	8 2023	9 2024	10 2025	11 2026	12 2027	13 2028	14 2029	15 2030	16 2031	17 2032	18 2033	19 2034	20 2035	21 2036	22 2037	23 2038	24 2039
Investment																									
Asset Replacement	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total investment	£m																								
Avoided DNO costs																									
Inspections & Maintenance	£m																								
Asset Replacement	£m																								
Refurbishment	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total avoided DNO costs	£m																								
Total DNO net benefits before capitalisation	£m																								
(1) = investment + DNO benefits																									
Capitalisation rates	%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	
Capitalised investment	£m																								
(3)=(1)x(2)																									
Investment to be expensed	£m																								
(4)=(1)-(3)																									
Depreciation	£m																								
(5)=Σ(5) _t																									
Cost of Capital	£m																								
(6)=avg[(6 ^{cl}),(6 ^{op})]xWACC																									
Total Net DNO benefits	£m																								
(7)=(4)+(5)+(6)																									
Societal benefits (£m) i.e. costs avoided																									
Losses	£m																								
CO2e associated with losses	£m																								
Customer interruptions (CI)	£m																								
Customer minutes lost (CML)	£m																								
Other GHG emissions (CO2e) i.e. not associated with losses	£m																								
Fatality	£m																								
Major injury	£m																								
Oil leakage	£m																								
Other 1 (specify)	£m																								
Other 2 (specify)	£m																								
Other 3 (specify)	£m																								
Total societal net benefits	£m																								
Net benefits	£m																								
Discount factor																									
=1/[(1+SRTP)^n]																									
Discount factor (safety)																									
=1/[(1+PTPR)^n]																									
Discounted net benefits	£m																								
Cumulative discounted net benefits	£m																								

Non-DNO (eg societal) benefits		Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																								
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	
	Reduced emissions associated with losses	tCO2e	-	128.44	124.62	120.81	117.00	113.19	109.37	105.56	101.75	97.94	94.13	90.31	86.50	82.69	78.88	75.06	71.25	67.44	63.63	59.81	56.00	52.19	48.38	44.57
	Reduced number of customers interrupted	no.																								
	Reduced customer minutes lost	Mins																								
	Reduced emissions (not associated with losses) ¹	tCO2e																								
	Reduced probability of fatality ²	%																								
	Reduced probability of major injury ²	%																								
	Reduced oil leakage	Litres																								

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors
<http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
 Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
 All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpcheck.htm>

CBA Option 2.2 Sensitivity check: Option 2 with 3yr refurb life extension

Term (years from first out flow)	NPV (£m)
16	£0.20
24	£0.29
32	£0.35
45	£0.42

first year of investment out flow |

Calculation	Units	RIIO-ED1								RIIO-ED2								RIIO-ED3							
		1 2016	2 2017	3 2018	4 2019	5 2020	6 2021	7 2022	8 2023	9 2024	10 2025	11 2026	12 2027	13 2028	14 2029	15 2030	16 2031	17 2032	18 2033	19 2034	20 2035	21 2036	22 2037	23 2038	24 2039
Investment																									
Asset Replacement	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total investment	£m																								
Avoided DNO costs																									
Inspections & Maintenance	£m																								
Asset Replacement	£m																								
Refurbishment	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total avoided DNO costs	£m																								
Total DNO net benefits before capitalisation	£m																								
(1) = investment + DNO benefits																									
Capitalisation rates	%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	
Capitalised investment	£m																								
(3)=(1)x(2)																									
Investment to be expensed	£m																								
(4)=(1)-(3)																									
Depreciation	£m		(0.01)	(0.01)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
(5)=Σ(5) _t																									
Cost of Capital	£m	(0.01)	(0.01)	(0.00)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
(6)=avg[(6 ^{cl}),(6 ^{op})]xWACC																									
Total Net DNO benefits	£m	(0.13)	(0.02)	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
(7)=(4)+(5)+(6)																									
Societal benefits (£m) i.e. costs avoided																									
Losses	£m		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
CO2e associated with losses	£m		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Customer interruptions (CI)	£m																								
Customer minutes lost (CML)	£m																								
Other GHG emissions (CO2e) i.e. not associated with losses	£m																								
Fatality	£m																								
Major injury	£m																								
Oil leakage	£m																								
Other 1 (specify)	£m																								
Other 2 (specify)	£m																								
Other 3 (specify)	£m																								
Total societal net benefits	£m		0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
Net benefits	£m	(0.13)	(0.00)	0.15	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
Discount factor		=1/[(1+SRTP)^n]	0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.47	
Discount factor (safety)		=1/[(1+PTPR)^n]	0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72	
Discounted net benefits	£m		(0.12)	(0.00)	0.14	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Cumulative discounted net benefits	£m		(0.12)	(0.13)	0.01	0.02	0.04	0.05	0.07	0.08	0.10	0.11	0.13	0.14	0.16	0.17	0.19	0.20	0.21	0.22	0.24	0.25	0.26	0.27	

Non-DNO (eg societal) benefits		Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																							
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	
	Reduced emissions associated with losses	tCO2e	-	128.44	124.62	120.81	117.00	113.19	109.37	105.56	101.75	97.94	94.13	90.31	86.50	82.69	78.88	75.06	71.25	67.44	63.63	59.81	56.00	52.19	
	Reduced number of customers interrupted	no.																							
	Reduced customer minutes lost	Mins																							
	Reduced emissions (not associated with losses) ¹	tCO2e																							
	Reduced probability of fatality ²	%																							
	Reduced probability of major injury ²	%																							
	Reduced oil leakage	Litres																							

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors <http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpcheck.htm>

CBA Option 3 Replacement year 1 with very low loss unit vs baseline

Term (years from first out flow)	NPV (£m)
16	-£0.26
24	-£0.17
32	-£0.37
45	-£0.61

first year of investment out flow | I

			RIIO-ED1								RIIO-ED2								RIIO-ED3								
Calculation			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	
Investment	Asset Replacement	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Total investment	£m																									
Avoided DNO costs	Inspections & Maintenance	£m																									
	Asset Replacement	£m																									
	Refurbishment	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Total avoided DNO costs	£m																									
Total DNO net benefits before capitalisation	(1) = investment + DNO benefits	£m																									
Capitalisation rates	(2)	%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%		
Capitalised investment	(3)=(1)x(2)	£m																									
Investment to be expensed	(4)=(1)-(3)	£m																									
Depreciation	(5)=Σ(5) _t	£m		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		
Cost of Capital	(6)=avg[(6 ^{cl}),(6 ^{op})]xWACC	£m		(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		
Total Net DNO benefits	(7)=(4)+(5)+(6)	£m		(0.34)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	0.11	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)			
Societal benefits (£m) i.e. costs avoided	Losses	£m	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03			
	CO2e associated with losses	£m	-	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
	Customer interruptions (CI)	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Customer minutes lost (CML)	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Other GHG emissions (CO2e) i.e. not associated with losses	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Fatality	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Major injury	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Oil leakage	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Other 1 (specify)	£m																									
	Other 2 (specify)	£m																									
	Other 3 (specify)	£m																									
	Total societal net benefits		£m		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		
	Net benefits		£m		(0.34)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	0.15	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		
Discount factor	=1/[(1+SRTP)^n]		0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.47			
Discount factor (safety)	=1/[(1+PTPR)^n]		0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72			
Discounted net benefits		£m		(0.33)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	0.10	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
Cumulative discounted net benefits		£m		(0.33)	(0.35)	(0.36)	(0.38)	(0.39)	(0.41)	(0.42)	(0.43)	(0.43)	(0.33)	(0.32)	(0.31)	(0.30)	(0.28)	(0.27)	(0.26)	(0.25)	(0.23)	(0.22)	(0.21)	(0.20)			
Non-DNO (eg societal) benefits			Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																								
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh		527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527			
	Reduced emissions associated with losses	tCO2e		-	257.17	249.53	241.90	234.27	226.63	219.00	211.37	203.73	196.10	188.47	180.83	173.20	165.57	157.93	150.30	142.67	135.03	127.40	119.77	112.13			
	Reduced number of customers interrupted	no.																									
	Reduced customer minutes lost	Mins																									
	Reduced emissions (not associated with losses) ¹	tCO2e																									
	Reduced probability of fatality ²	%																									
	Reduced probability of major injury ²	%																									
Reduced oil leakage	Litres																										

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors
<http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
 Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
 All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpccheck.htm>

CBA Option 3.1 Sensitivity check: Option 3 with 5yr refurb life extension

Term (years from first out flow)	NPV (£m)
16	-£0.16
24	-£0.08
32	-£0.29
45	-£0.53

first year of investment out flow |

			RIIO-ED1								RIIO-ED2								RIIO-ED3							
Calculation			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Investment	Asset Replacement	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Total investment	£m																								
Avoided DNO costs	Inspections & Maintenance	£m																								
	Asset Replacement	£m																								
	Refurbishment	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
Total avoided DNO costs	£m																									
Total DNO net benefits before capitalisation (1) = investment + DNO benefits			£m																							
Capitalisation rates (2)			%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	
Capitalised investment (3)=(1)x(2)			£m																							
Investment to be expensed (4)=(1)-(3)			£m																							
Depreciation (5)=Σ(5) _t			£m		(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		
Cost of Capital (6)=avg[(6 ^{cl}),(6 ^{op})]xWACC			£m	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		
Total Net DNO benefits (7)=(4)+(5)+(6)			£m	(0.34)	(0.05)	(0.05)	(0.05)	0.11	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)		
Societal benefits (£m) i.e. costs avoided	Losses	£m		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03		
	CO2e associated with losses	£m		0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
	Customer interruptions (CI)	£m																								
	Customer minutes lost (CML)	£m																								
	Other GHG emissions (CO2e) i.e. not associated with losses	£m																								
	Fatality	£m																								
	Major injury	£m																								
	Oil leakage	£m																								
	Other 1 (specify)	£m																								
	Other 2 (specify)	£m																								
	Other 3 (specify)	£m																								
	Total societal net benefits	£m		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		
	Net benefits			£m	(0.34)	(0.02)	(0.02)	(0.02)	0.14	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
	Discount factor =1/[(1+SRTP)^n]				0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	
Discount factor (safety) =1/[(1+PTPR)^n]				0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72	
Discounted net benefits			£m	(0.33)	(0.02)	(0.02)	(0.02)	0.12	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Cumulative discounted net benefits			£m	(0.33)	(0.35)	(0.36)	(0.38)	(0.26)	(0.26)	(0.25)	(0.24)	(0.24)	(0.23)	(0.22)	(0.21)	(0.20)	(0.19)	(0.17)	(0.16)	(0.15)	(0.14)	(0.13)	(0.12)	(0.11)		
Non-DNO (eg societal) benefits			Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																							
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh		527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	
	Reduced emissions associated with losses	tCO2e		257.17	249.53	241.90	234.27	226.63	219.00	211.37	203.73	196.10	188.47	180.83	173.20	165.57	157.93	150.30	142.67	135.03	127.40	119.77	112.13	104.50		
	Reduced number of customers interrupted	no.																								
	Reduced customer minutes lost	Mins																								
	Reduced emissions (not associated with losses) ¹	tCO2e																								
	Reduced probability of fatality ²	%																								
	Reduced probability of major injury ²	%																								
	Reduced oil leakage	Litres																								

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors <http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpccheck.htm>

CBA Option 3.2 Sensitivity check: Option 3 with 3yr refurb life extension

Term (years from first out flow)	NPV (£m)
16	-£0.12
24	-£0.04
32	-£0.25
45	-£0.50

first year of investment out flow |

			RIIO-ED1								RIIO-ED2								RIIO-ED3								
Calculation			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	
Investment	Asset Replacement	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Total investment	£m																									
Avoided DNO costs	Inspections & Maintenance	£m																									
	Asset Replacement	£m																									
	Refurbishment	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Total avoided DNO costs	£m																									
Total DNO net benefits before capitalisation (1) = investment + DNO benefits			£m																								
Capitalisation rates	(2)	%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%			
Capitalised investment	(3)=(1)x(2)	£m																									
Investment to be expensed	(4)=(1)-(3)	£m																									
Depreciation	(5)=Σ(5) _t	£m		(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)			
Cost of Capital	(6)=avg[(6 ^{cl}),(6 ^{op})]xWACC	£m	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)			
Total Net DNO benefits	(7)=(4)+(5)+(6)	£m	(0.34)	(0.05)	0.11	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)			
Societal benefits (£m) i.e. costs avoided	Losses	£m	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03			
	CO2e associated with losses	£m	-	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
	Customer interruptions (CI)	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Customer minutes lost (CML)	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Other GHG emissions (CO2e) i.e. not associated with losses	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Fatality	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Major injury	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Oil leakage	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Other 1 (specify)	£m																									
	Other 2 (specify)	£m																									
	Other 3 (specify)	£m																									
	Total societal net benefits		£m	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04		
	Net benefits		£m	(0.34)	(0.02)	0.14	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		
	Discount factor	=1/[(1+SRTP)^n]		0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.47		
Discount factor (safety)	=1/[(1+PTPR)^n]		0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72			
Discounted net benefits		£m	(0.33)	(0.02)	0.12	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
Cumulative discounted net benefits		£m	(0.33)	(0.35)	(0.22)	(0.22)	(0.22)	(0.21)	(0.21)	(0.20)	(0.19)	(0.18)	(0.17)	(0.16)	(0.15)	(0.14)	(0.13)	(0.12)	(0.11)	(0.10)	(0.09)	(0.08)	(0.07)	(0.06)			
Non-DNO (eg societal) benefits			Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																								
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh		527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527			
	Reduced emissions associated with losses	tCO2e	-	257.17	249.53	241.90	234.27	226.63	219.00	211.37	203.73	196.10	188.47	180.83	173.20	165.57	157.93	150.30	142.67	135.03	127.40	119.77	112.13	104.50			
	Reduced number of customers interrupted	no.																									
	Reduced customer minutes lost	Mins																									
	Reduced emissions (not associated with losses) ¹	tCO2e																									
	Reduced probability of fatality ²	%																									
	Reduced probability of major injury ²	%																									
	Reduced oil leakage	Litres																									

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors <http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>. Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values. All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpccheck.htm>

CBA Option 3.3 Sensitivity check: Option 3 with 15yr refurb life extension

Term (years from first out flow)	NPV (£m)
16	-£0.34
24	-£0.25
32	-£0.45
45	-£0.68

first year of investment out flow |

			RIIO-ED1								RIIO-ED2								RIIO-ED3							
Calculation			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Investment	Asset Replacement	£m	█																							
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Total investment	£m	█	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Avoided DNO costs	Inspections & Maintenance	£m																								
	Asset Replacement	£m																								
	Refurbishment	£m	█																							
	Please specify	£m																								
	Please specify	£m																								
	Total avoided DNO costs	£m	█	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total DNO net benefits before capitalisation (1) = investment + DNO benefits			£m	█	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Capitalisation rates (2)			%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%		
Capitalised investment (3)=(1)x(2)			£m	█	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Investment to be expensed (4)=(1)-(3)			£m	█	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Depreciation (5)=Σ(5) _t			£m	-	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		
Cost of Capital (6)=avg[(6 ^{cl}),(6 ^{op})]xWACC			£m	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)		
Total Net DNO benefits (7)=(4)+(5)+(6)			£m	(0.34)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	0.12	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		
Societal benefits (£m) i.e. costs avoided	Losses	£m	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03		
	CO2e associated with losses	£m	-	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
	Customer interruptions (CI)	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Customer minutes lost (CML)	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Other GHG emissions (CO2e) i.e. not associated with losses	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Fatality	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Major injury	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Oil leakage	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Other 1 (specify)	£m																								
	Other 2 (specify)	£m																								
	Other 3 (specify)	£m																								
	Total societal net benefits			£m	-	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
	Net benefits			£m	(0.34)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	0.15	0.02	0.02	0.02	0.02	0.03	0.03	0.03	
Discount factor =1/[(1+SRTP)^n]				0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49		
Discount factor (safety) =1/[(1+PTPR)^n]				0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73		
Discounted net benefits			£m	(0.33)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	0.09	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Cumulative discounted net benefits			£m	(0.33)	(0.35)	(0.36)	(0.38)	(0.39)	(0.41)	(0.42)	(0.43)	(0.43)	(0.44)	(0.44)	(0.45)	(0.45)	(0.45)	(0.36)	(0.34)	(0.33)	(0.32)	(0.31)	(0.29)	(0.28)		

Non-DNO (eg societal) benefits																							
Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																							
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527
	Reduced emissions associated with losses	tCO2e	-	257.17	249.53	241.90	234.27	226.63	219.00	211.37	203.73	196.10	188.47	180.83	173.20	165.57	157.93	150.30	142.67	135.03	127.40	119.77	112.13
	Reduced number of customers interrupted	no.																					
	Reduced customer minutes lost	Mins																					
	Reduced emissions (not associated with losses) ¹	tCO2e																					
	Reduced probability of fatality ²	%																					
	Reduced probability of major injury ²	%																					
	Reduced oil leakage	Litres																					

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors
<http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
 Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
 All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarmpcheck.htm>

CBA Option 4 Refurbishment year 1 giving 10 year life extension, followed by replacement with capitalised loss unit

Term (years from first out flow)	NPV (£m)
16	£0.01
24	£0.06
32	£0.09
45	£0.13
first year of investment out flow	1

			RIIO-ED1								RIIO-ED2								RIIO-ED3							
Calculation			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Investment	Asset Replacement	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Total investment	£m																								
Avoided DNO costs	Inspections & Maintenance	£m																								
	Asset Replacement	£m																								
	Refurbishment	£m																								
	Please specify	£m																								
	Please specify	£m																								
	Please specify	£m																								
Total avoided DNO costs	£m																									
Total DNO net benefits before capitalisation	(1) = investment + DNO benefits	£m																								
Capitalisation rates	(2)	%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%		
Capitalised investment	(3)=(1)x(2)	£m																								
Investment to be expensed	(4)=(1)-(3)	£m																								
Depreciation	(5)=Σ(5) _t	£m		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
Cost of Capital	(6)=avg[(6) ^{cl} , (6) ^{op}]xWACC	£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
Total Net DNO benefits	(7)=(4)+(5)+(6)	£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		
Societal benefits (£m) i.e. costs avoided	Losses	£m																								
	CO2e associated with losses	£m																								
	Customer interruptions (CI)	£m																								
	Customer minutes lost (CML)	£m																								
	Other GHG emissions (CO2e) i.e. not associated with losses	£m																								
	Fatality	£m																								
	Major injury	£m																								
	Oil leakage	£m																								
	Other 1 (specify)	£m																								
	Other 2 (specify)	£m																								
	Other 3 (specify)	£m																								
	Total societal net benefits	£m	-	-	-	-	-	-	-	-	-	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		
	Net benefits	£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Discount factor	=1/[(1+S RTP)^n]		0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.47		
Discount factor (safety)	=1/[(1+PTPR)^n]		0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72		
Discounted net benefits	£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
Cumulative discounted net benefits	£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.03)	(0.02)	(0.02)	(0.01)	(0.00)	0.01	0.01	0.02	0.03	0.03	0.04	0.05			
Non-DNO (eg societal) benefits			Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																							
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh																								
	Reduced emissions associated with losses	tCO2e																								
	Reduced number of customers interrupted	no.																								
	Reduced customer minutes lost	Mins																								
	Reduced emissions (not associated with losses) ¹	tCO2e																								
	Reduced probability of fatality ²	%																								
	Reduced probability of major injury ²	%																								
Reduced oil leakage	Litres																									

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors
<http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
 Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
 All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.
² <http://www.hse.gov.uk/risk/theory/alarpcheck.htm>

CBA Option 4.1 Sensitivity check: Option 4 with 5yr refurb life extension

Term (years from first out flow)	NPV (£m)
16	-£0.06
24	-£0.00
32	£0.04
45	£0.09

first year of investment out flow |

			RIIO-ED1					RIIO-ED2					RIIO-ED3														
Calculation			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	
Investment	Asset Replacement	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Total investment	£m																									
Avoided DNO costs	Inspections & Maintenance	£m																									
	Asset Replacement	£m																									
	Refurbishment	£m																									
	Please specify	£m																									
	Please specify	£m																									
	Please specify	£m																									
Total avoided DNO costs	£m																										
Total DNO net benefits before capitalisation (1) = investment + DNO benefits			£m																								
Capitalisation rates (2)			%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	
Capitalised investment (3)=(1)x(2)			£m																								
Investment to be expensed (4)=(1)-(3)			£m																								
Depreciation (5)=Σ(5) _t			£m		(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
Cost of Capital (6)=avg[(6) ^{cl} , (6) ^{op}]]xWACC			£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
Total Net DNO benefits (7)=(4)+(5)+(6)			£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.21)	(0.03)	(0.03)	(0.03)	(0.03)	0.13	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
Societal benefits (£m) i.e. costs avoided	Losses	£m						0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
	CO2e associated with losses	£m							0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Customer interruptions (CI)	£m																									
	Customer minutes lost (CML)	£m																									
	Other GHG emissions (CO2e) i.e. not associated with losses	£m																									
	Fatality	£m																									
	Major injury	£m																									
	Oil leakage	£m																									
	Other 1 (specify)	£m																									
	Other 2 (specify)	£m																									
	Other 3 (specify)	£m																									
	Total societal net benefits	£m						0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
	Net benefits			£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.21)	(0.01)	(0.01)	(0.01)	(0.01)	0.14	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	
	Discount factor =1/[(1+S RTP)^n]				0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.47	
Discount factor (safety) =1/[(1+PTPR)^n]				0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72		
Discounted net benefits			£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.17)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.10	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Cumulative discounted net benefits			£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.18)	(0.19)	(0.20)	(0.21)	(0.22)	(0.11)	(0.11)	(0.10)	(0.09)	(0.08)	(0.07)	(0.06)	(0.05)	(0.05)	(0.04)	(0.03)	(0.02)	(0.01)		
Non-DNO (eg societal) benefits			Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																								
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh						263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263		
	Reduced emissions associated with losses	tCO2e							113.10	109.29	105.48	101.67	97.86	94.05	90.24	86.44	82.63	78.82	75.01	71.20	67.39	63.58	59.77	55.96	52.15		
	Reduced number of customers interrupted	no.																									
	Reduced customer minutes lost	Mins																									
	Reduced emissions (not associated with losses) ¹	tCO2e																									
	Reduced probability of fatality ²	%																									
	Reduced probability of major injury ²	%																									
	Reduced oil leakage	Litres																									

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors <http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpccheck.htm>

CBA Option 4.2 Sensitivity check: Option 4 with 3yr refurb life extension

Term (years from first out flow)	NPV (£m)
16	-£0.09
24	-£0.03
32	£0.02
45	£0.07

first year of investment out flow |

Calculation	Units	R110-ED1								R110-ED2								R110-ED3							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Investment	Asset Replacement	£m																							
	Please specify	£m																							
	Please specify	£m																							
	Please specify	£m																							
	Please specify	£m																							
	Total investment	£m																							
Avoided DNO costs	Inspections & Maintenance	£m																							
	Asset Replacement	£m																							
	Refurbishment	£m																							
	Please specify	£m																							
	Please specify	£m																							
	Please specify	£m																							
	Total avoided DNO costs	£m																							
	Total DNO net benefits before capitalisation (1) = investment + DNO benefits	£m																							
	Capitalisation rates (2)	%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	
	Capitalised investment (3)=(1)x(2)	£m																							
	Investment to be expensed (4)=(1)-(3)	£m																							
	Depreciation (5)=Σ(5) _t	£m	-	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	
	Cost of Capital (6)=avg[(6) ^{cl} , (6) ^{op}]]xWACC	£m	(0.00)	(0.00)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	
	Total Net DNO benefits (7)=(4)+(5)+(6)	£m	(0.00)	(0.00)	(0.21)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	0.13	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	
Societal benefits (£m) i.e. costs avoided	Losses	£m	-	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
	CO2e associated with losses	£m	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
	Customer interruptions (CI)	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Customer minutes lost (CML)	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Other GHG emissions (CO2e) i.e. not associated with losses	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Fatality	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Major injury	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Oil leakage	£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Other 1 (specify)	£m																							
	Other 2 (specify)	£m																							
	Other 3 (specify)	£m																							
	Total societal net benefits	£m	-	-	-	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
	Net benefits	£m	(0.00)	(0.00)	(0.21)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	0.15	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02		
	Discount factor =1/[(1+SRTP)^n]		0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.47	
	Discount factor (safety) =1/[(1+PTPR)^n]		0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72	
	Discounted net benefits	£m	(0.00)	(0.00)	(0.19)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.10	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		
	Cumulative discounted net benefits	£m	(0.00)	(0.00)	(0.19)	(0.20)	(0.21)	(0.23)	(0.24)	(0.24)	(0.25)	(0.15)	(0.14)	(0.13)	(0.12)	(0.11)	(0.10)	(0.09)	(0.09)	(0.08)	(0.07)	(0.06)	(0.05)		

Non-DNO (eg societal) benefits		Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh				263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	263	
	Reduced emissions associated with losses	tCO2e	-	-	-	120.72	116.91	113.10	109.29	105.48	101.67	97.86	94.05	90.24	86.44	82.63	78.82	75.01	71.20	67.39	63.58	59.77	55.96	52.15	
	Reduced number of customers interrupted	no.																							
	Reduced customer minutes lost	Mins																							
	Reduced emissions (not associated with losses) ¹	tCO2e																							
	Reduced probability of fatality ²	%																							
	Reduced probability of major injury ²	%																							
Reduced oil leakage	Litres																								

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors <http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpccheck.htm>

CBA Option 4.3 Sensitivity check: Option 4 with 15yr refurb life extension

Term (years from first out flow)	NPV (£m)
16	£0.06
24	£0.10
32	£0.13
45	£0.16

first year of investment out flow |

Calculation	Units	RIIO-ED1								RIIO-ED2								RIIO-ED3							
		1 2016	2 2017	3 2018	4 2019	5 2020	6 2021	7 2022	8 2023	9 2024	10 2025	11 2026	12 2027	13 2028	14 2029	15 2030	16 2031	17 2032	18 2033	19 2034	20 2035	21 2036	22 2037	23 2038	24 2039
Investment																									
Asset Replacement	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total investment	£m																								
Avoided DNO costs																									
Inspections & Maintenance	£m																								
Asset Replacement	£m																								
Refurbishment	£m																								
Please specify	£m																								
Please specify	£m																								
Please specify	£m																								
Total avoided DNO costs	£m																								
Total DNO net benefits before capitalisation	£m																								
(1) = investment + DNO benefits	£m																								
Capitalisation rates	%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
Capitalised investment	£m																								
(3)=(1)x(2)	£m																								
Investment to be expensed	£m																								
(4)=(1)-(3)	£m																								
Depreciation	£m		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	0.01	0.01	0.01	0.01	0.01	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	
(5)=Σ(5) _t	£m																								
Cost of Capital	£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	0.01	0.01	0.01	0.01	0.01	0.00	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
(6)=avg[(6 ^{cl}),(6 ^{op})]xWACC	£m																								
Total Net DNO benefits	£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	0.16	0.02	0.02	0.02	0.02	(0.19)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
(7)=(4)+(5)+(6)	£m																								
Societal benefits (£m) i.e. costs avoided																									
Losses	£m																								
CO2e associated with losses	£m																								
Customer interruptions (CI)	£m																								
Customer minutes lost (CML)	£m																								
Other GHG emissions (CO2e) i.e. not associated with losses	£m																								
Fatality	£m																								
Major injury	£m																								
Oil leakage	£m																								
Other 1 (specify)	£m																								
Other 2 (specify)	£m																								
Other 3 (specify)	£m																								
Total societal net benefits	£m															0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Net benefits	£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	0.16	0.02	0.02	0.02	0.02	(0.19)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Discount factor		0.97	0.93	0.90	0.87	0.84	0.81	0.79	0.76	0.73	0.71	0.68	0.66	0.64	0.62	0.60	0.58	0.56	0.54	0.52	0.50	0.49	0.47	0.45	0.44
=1/[(1+SRTP)^n]																									
Discount factor (safety)		0.99	0.97	0.96	0.94	0.93	0.91	0.90	0.89	0.87	0.86	0.85	0.84	0.82	0.81	0.80	0.79	0.78	0.76	0.75	0.74	0.73	0.72	0.71	0.70
=1/[(1+PTPR)^n]																									
Discounted net benefits	£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	0.11	0.02	0.01	0.01	0.01	(0.11)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
Cumulative discounted net benefits	£m	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	0.11	0.12	0.14	0.15	0.16	0.05	0.06	0.07	0.07	0.08	0.08	0.09	0.09	0.10	0.10	0.10

Non-DNO (eg societal) benefits		Enter values as increments (delta) relative to your reference scenario. If this is your reference scenario enter 0. Reductions are entered as positive numbers and increases as negative numbers.																							
Societal net benefits (impact relative to business as usual scenario)	Reduced losses	MWh																							
	Reduced emissions associated with losses	tCO2e																							
	Reduced number of customers interrupted	no.																							
	Reduced customer minutes lost	Mins																							
	Reduced emissions (not associated with losses) ¹	tCO2e																							
	Reduced probability of fatality ²	%																							
	Reduced probability of major injury ²	%																							
	Reduced oil leakage	Litres																							

¹ Includes all GHG not associated with losses e.g. SF6 converted to tCO2e using Defra conversion factors
<http://www.defra.gov.uk/publications/2012/05/30/pb13773-2012-ghg-conversion/>
 Where losses are entered in terms of MWh, the CO2e associated with those losses will be calculated based on an assumed GHG conversion factor. The tCO2e are monetised using DECC traded carbon values.
 All other GHG emissions not associated with losses should be entered in row 90 to avoid double counting.

² <http://www.hse.gov.uk/risk/theory/alarpccheck.htm>