Purpose of CBA: describe the primary driver of the investment decision

The purpose of this CBA is to support our decision to use Bidoyng a technology that provides us with accurate demand data, pre-fault detection and location, post fault location, cable condition assessment and fault remote reclosing.

If investment is to replace an existing asset / asset class, please state the condition of the asset / asset class (HI / CI etc.)

List below all options considered to meet the stated aim

Options considered / project name	**Comment**
Option 1 (Baseline)	Do Nothing Scenario. Normal fault location occurrs
Option 2	LV automation team locates faults using Bidoyng technology

List below the short list of those options which have been costed within this CBA workbook

Option no.	**Options considered**	**Decision**	**Comment**	**For the chosen option only, provide detail of where CBA expenditure included in this CBA is reported in the BPDT pack. e.g. LV swtichgear BPDT CV3**	NPVs based on payback periods				
					16 years	24 years	32 years	45 years	DNO view
1	Normal Fault Location Activities	Rejected			-£3.33	-£3.38	-£3.42	-£3.45	
2	Bidoyng Fault Location	Adopted			-£1.48	-£1.73	-£1.89	-£2.06	
3									
4									
5									
6									
7									
8									

CBA Option 1 - Baseline **Traditional Reinforcement**

Term (years from first out flow)	NPV (£m)
16	-£3.33
24	-£3.38
32	-£3.42
45	-£3.45

first year of investment out flow: 1

			Units	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
		Calculation		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	Trouble Call / faults		£m				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Please specify		£m																								
	Please specify		£m																								
	Please specify		£m																								
	Please specify		£m																								
	Total investment		£m		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avoided DNO costs	Trouble Call / faults		£m																								
	Please specify		£m																								
	Please specify		£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	(0.12)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Depreciation	(5)=$\sum(5)_t$	£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)	(0.01)	(0.01)
	Cost of Capital	(6)=avg[(6^{cl}),(6^{ce})]xWACC	£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)	(0.01)	(0.01)
	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)**	**(0.02)**	**(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)**
Societal benefits (£m) i.e. costs avoided	Losses		£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	CO2e associated with losses		£m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Customer interruptions (CI)		£m	(0.58)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Customer minutes lost (CML)		£m	(2.55)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	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**	**(3.13)**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Net benefits		**£m**	**(3.26)**	**(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)**	**(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	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	(3.15)	(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)	(0.01)	(0.01)	(0.01)
	Cumulative discounted net benefits		**£m**	**(3.15)**	**(3.17)**	**(3.18)**	**(3.20)**	**(3.21)**	**(3.23)**	**(3.24)**	**(3.25)**	**(3.26)**	**(3.28)**	**(3.29)**	**(3.30)**	**(3.31)**	**(3.31)**	**(3.32)**	**(3.33)**	**(3.34)**	**(3.35)**	**(3.35)**	**(3.36)**	**(3.37)**	**(3.37)**	**(3.38)**	**(3.38)**

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.	(54,180)
	Reduced customer minutes lost	Mins	(9,796,449)
	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 **LV automation team locates faults using Bidoyng technology**

Term (years from first out flow)	NPV (£m)
16	-£1.48
24	-£1.73
32	-£1.89
45	-£2.06

first year of investment out flow: 1

		Calculation	Units	RIIO-ED1 1 2016	2 2017	3 2018	4 2019	5 2020	6 2021	7 2022	8 2023	RIIO-ED2 9 2024	10 2025	11 2026	12 2027	13 2028	14 2029	15 2030	16 2031	RIIO-ED3 17 2032	18 2033	19 2034	20 2035	21 2036	22 2037	23 2038	24 2039
Investment	Trouble Call / faults		£m									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Please specify		£m									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Please specify		£m									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Please specify		£m																								
	Please specify		£m																								
	Total investment		£m		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avoided DNO costs	Trouble Call / faults		£m																								
	Please specify		£m																								
	Please specify		£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	(0.60)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Depreciation	$(5)=\sum(5)_t$	£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)	(0.03)	(0.03)	(0.03)
	Cost of Capital	$(6)=avg[(6^{cl}),(6^{oe})]xWACC$	£m	(0.03)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
	Total Net DNO benefits	**(7)=(4)+(5)+(6)**	**£m**	**(0.63)**	**(0.09)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.06)**	**(0.06)**	**(0.06)**	**(0.06)**	**(0.06)**
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**	**(0.63)**	**(0.09)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.08)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.06)**	**(0.06)**	**(0.06)**	**(0.06)**	**(0.06)**
	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	(0.60)	(0.08)	(0.08)	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
	Cumulative discounted net benefits		**£m**	**(0.60)**	**(0.68)**	**(0.76)**	**(0.83)**	**(0.90)**	**(0.97)**	**(1.03)**	**(1.09)**	**(1.15)**	**(1.20)**	**(1.25)**	**(1.30)**	**(1.35)**	**(1.39)**	**(1.44)**	**(1.48)**	**(1.51)**	**(1.55)**	**(1.58)**	**(1.61)**	**(1.64)**	**(1.67)**	**(1.70)**	**(1.73)**

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.

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