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

Tree harvesting adjacent to our overhead network presents increasing challenges to SSEPD, particularly in our SSEH licence area. The objective of this CBA was to support the decision to employ and develop safe systems of work to carry out mechanised harvesting adjacent to a live network.

**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 tree cutting operations take place here by third parties. Generation and associated CI / CML costs have been included |
| Option 2 | Currently one hired live line tree cutter makes up the costs. Benefits are the reduction in diesel generation along with associated CI CML costs of generation activities. |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

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

| Option no. | Options considered | Decision | xx | 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 | Baseline Contractors & Hand Felling Harvesting | Rejected | xx | | -£1.57 | -£1.66 | -£1.72 | -£1.78 | |
| 2 | Live Line Tree Harvesting | Adopted | xx | | -£0.19 | -£0.22 | -£0.24 | -£0.27 | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |

**CBA Option 1 - Baseline**  **Traditional Reinforcement**

| Term (years from first out flow) | NPV (£m) |
|---|---|
| 16 | -£1.57 |
| 24 | -£1.66 |
| 32 | -£1.72 |
| 45 | -£1.78 |

| first year of investment out flow | 1 |
|---|---|

| | | | | | RIIO-ED1 | | | | | | | | RIIO-ED2 | | | | | | | | RIIO-ED3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Calculation | Units | 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** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tree Cutting | | £m | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Please specify | | £m | | | | | | | | | | | | | | | | | | | | | | | | |
| Please specify | | £m | | | | | | | | | | | | | | | | | | | | | | | | |
| Please specify | | £m | | | | | | | | | | | | | | | | | | | | | | | | |
| Please specify | | £m | | | | | | | | | | | | | | | | | | | | | | | | |
| Total investment | | £m | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Avoided DNO costs** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Please specify | | £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)×(2) | £m | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Investment to be expensed | (4)=(1)-(3) | £m | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Depreciation | (5)=∑(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) |
| Cost of Capital | (6)=avg[(6ᶜˡ),(6ᵒᵖ)]×WACC | £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) | (0.01) | (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 | (0.22) | (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) | (0.02) | (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 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2e associated with losses | | £m | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Customer interruptions (CI) | | £m | (0.25) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Customer minutes lost (CML) | | £m | (0.81) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other GHG emissions (CO2e) i.e. not associated with losses | | £m | (0.02) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 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 | (1.08) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Net benefits** | | £m | (1.30) | (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) | (0.02) | (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 | 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 | (1.26) | (0.03) | (0.03) | (0.03) | (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) |
| **Cumulative discounted net benefits** | | £m | (1.26) | (1.29) | (1.32) | (1.34) | (1.37) | (1.39) | (1.41) | (1.44) | (1.46) | (1.48) | (1.49) | (1.51) | (1.53) | (1.54) | (1.56) | (1.57) | (1.59) | (1.60) | (1.61) | (1.62) | (1.63) | (1.64) | (1.65) | (1.66) |

**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) | Units | |
|---|---|---|
| Reduced losses | MWh | |
| Reduced emissions associated with losses | tCO2e | |
| Reduced number of customers interrupted | no. | (36,182) |
| Reduced customer minutes lost | Mins | (5,472,653) |
| Reduced emissions (not associated with losses)[1] | tCO2e | -2,720 |
| 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**  Live Line Tree Harvesting

| Term (years from first out flow) | NPV (£m) |
|---|---|
| 16 | -£0.19 |
| 24 | -£0.22 |
| 32 | -£0.24 |
| 45 | -£0.27 |

| first year of investment out flow | 1 |
|---|---|

| | | | | RIIO-ED1 | | | | | | | | RIIO-ED2 | | | | | | | | RIIO-ED3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Calculation | Units | 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** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tree Cutting | | £m | | | | | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Please specify | | £m | | | | | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Please specify | | £m | | | | | | | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Please specify | | £m | | | | | | | | | | | | | | | | | | | | | | | | |
| Please specify | | £m | | | | | | | | | | | | | | | | | | | | | | | | |
| Total investment | | £m | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Avoided DNO costs** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tree Cutting | | £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)×(2) | £m | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Investment to be expensed | (4)=(1)-(3) | £m | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Depreciation | $(5)=\sum(5)_t$ | £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) | (0.00) | (0.00) |
| Cost of Capital | $(6)=avg[(6^{c1}),(6^{op})]\times WACC$ | £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) | (0.01) | (0.01) | (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 | (0.08) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (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) | (0.01) | (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) |
| 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 | (0.08) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **Cumulative discounted net benefits** | | £m | (0.08) | (0.09) | (0.10) | (0.11) | (0.12) | (0.12) | (0.13) | (0.14) | (0.15) | (0.15) | (0.16) | (0.17) | (0.17) | (0.18) | (0.18) | (0.19) | (0.19) | (0.20) | (0.20) | (0.21) | (0.21) | (0.22) | (0.22) | (0.22) |

**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) | Units | |
|---|---|---|
| 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 | -64 |
| 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