

SSEN DISTRIBUTION RIIO-ED2

COST BENEFIT ANALYSIS PROCESS

RIIO-ED2 Business Plan Annex 25



Scottish & Southern
Electricity Networks

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INTRODUCTION

Purpose of this Document

This document sets out the methodology we have applied to Cost Benefit Analysis (CBA) to support our RIIO-ED2 Business Plan.

The purpose of the methodology is to help decision makers within SSE Distribution make informed choices on investment decisions, and provides a framework for regulator and wider stakeholder assessment of the comparative societal, environmental and economic benefits and trade-offs associated with proposed investment options to enable the selection of the best value option for the end consumer. The approach outlined in this methodology can be applied to all investment types.

Cost Benefit Analysis need

As SSEN Distribution is a provider of an essential public service in the North of Scotland and Southern England, standard appraisal methods based on projected profits and investment expenditures are not always readily applicable due to the intangible nature of public benefits associated with our investments.

The application of Cost Benefit Analysis (CBA) helps us identify the most cost-effective allocation of investments that will enable us to continue to provide a reliable, effective distribution network and facilitate the transition towards a clean energy economy.

Before making any decision on expenditure, we always ensure the need for that investment, and the preferred option is the one that realises the most overall benefit for energy consumer and wider local communities.

This appraisal can be further complicated by the long life and high cost of distribution infrastructure and in some cases, it can be of greatest benefit to build once rather than return to make a second upgrade. CBA improves the quality of such investment decisions by making explicit links between the inputs (i.e. the costs) and the outcomes (i.e. the benefits) of the investment. It attempts to express these in monetary terms which then enables the comparison across the alternative investment options.

It is worth noting that CBAs will not provide the definitive solutions in all cases, but in these cases we use the outputs as a component in our decision making process, so results are typically used in conjunction with other analysis/qualitative considerations.

There is often the need for assumptions or reliance on secondary data, which can limit the ability to draw out conclusive evidence for investment from the CBA alone. Therefore, we acknowledge that the outputs from CBA modelling should be used with care, with a full understanding of the limitations that may exist with the data and the assumptions upon which the analysis is based.

Our CBA strategy

In our RIIO-ED1 investments for IT and Flexibility schemes, we have ensured CBA analysis is carried out to help clarify and understand the financial benefit such investment would bring to consumers.

Furthermore, ongoing development of our Large Capital Projects (LCP) policies is embedding a culture of ensuring a CBA is considered in the early stages of a LCP planning, again to ensure benefit is demonstrated.

The ongoing development of this has enabled us to utilise CBAs in the planning of our RIIO-ED2 expenditure, helping us to explain and justify these expenditure levels as part of our overall investment decisions.

CBA MODELLING

When we use CBA modelling

We have developed different criteria to determine when we will use CBA modelling:

- a) Where investment is above £2m threshold ;
- b) If Flexibility is a technical option for the project ;
- c) There are genuine multiple investment options available ;
- d) There are differences in benefits between options.

These options have been determined utilising the Ofgem CBA guidance documents and with communication during CBA Working Group meetings amongst Ofgem and other DNOs.

Long with Ofgem's views, with Ofgem, we believe that a CBA model is best utilised when a project contains optionality. Analysis carried out at the inception of a project should determine what optionality is available, and therefore whether a CBA is required.

Optioneering is then developed by the project owners / engineers and has been explained within the corresponding Engineering Justification Papers (EJP) for the relevant project.

There will be instances where a CBA is not required as part of the decision-making process. This could be where there are no credible alternative options, i.e. a like-for-like asset replacement, or where there are technically no feasible alternatives.

A CBA approach is undertaken when a quantitative calculation can be carried out to determine different courses of action. When a quantitative assessment cannot be undertaken, the EJP will carry out an appropriate qualitative assessment through need and engineering justification.

Use of CBA alongside other tools

As well as EJPs to help explain the narrative of projects, we have also utilised a model developed within the ENA by external contractors Barringa to help determine flexibility.

This model has been developed to better understand if deferring investment, even for a year or more, can engender savings due to the cost value of money deferment.

Our CBA approach and Ofgem Guidance

Ofgem, with engagement with Distribution Network Operators (DNOs) have developed the RIIO-ED1 CBA model further to include learnings during the RIIO-2 process for Electricity Transmission and Gas Distribution.

As in previous price controls, the model utilises a “Spackman” approach. This aims to closely follow the Regulatory model in which DNOs are paid for their services. This is to best ensure the costs of projects are aligned to when consumers are expected to pay for them.

The “Spackman” approach includes annualising capital costs using the weighted average cost of capital (WACC). This is then discounted utilising rates provided within the HM Treasury Green Book¹.

The model includes separate areas for DNO related costs, which have the “Spackman” approach applied and the inclusion of wider societal benefits (and costs) which do not have this approach applied.

Ofgem provided CBA guidance on the 31st March 2021, below are the main guidance points and how SSE have applied them to our approach.

¹ <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government/the-green-book-2020>

Table 1 – Ofgem Guidance and SSE Approach

Ofgem Guidance	SSE Approach
<p>2.3. We have included a section in the CBA spreadsheet model for DNOs to clearly identify the list of options they have considered for each investment decision. It should include those that have been considered and rejected before full costing, and the short list of those options that have been considered and costed, with a clear rationale for including/excluding them.</p>	<p>We have demonstrated our optioneering analysis within the corresponding EJP, to determine which options should be carried forward to a CBA.</p>
<p>3.1. The DNO should describe the status quo: that is the cost of business as usual in the absence of any investment intervention.</p>	<p>CBA's completed for RIIO-2 are based on an opportunity type cost / benefit approach. This being, we determine our expected start point for the beginning of RIIO-2 and this becomes our baseline. All costs and benefits should be incremental to this baseline, showing the opportunity to be incurred by carrying out the option.</p> <p>We believe this approach ensures simple understanding on overall societal benefit delivered by a particular option.</p>
<p>3.4. In both cases described above, it is important that the baseline provides a scenario that is technically feasible and consistent with the DNO's regulatory requirements. It should represent a scenario that is a realistic option for the DNO; i.e. it should not reflect for instance a 'do nothing' or 'run to failure' approach if this is not a practical option for the DNO to employ as a business strategy.</p>	<p>Details on optioneering is explained within the corresponding EJP, but in all cases a 'Do-Nothing' approach is only considered when it is a practical and feasible solution.</p>
<p>3.10. DNOs should also include replacement costs for the particular assets specified which may need to be replaced during the 45-year horizon. DNOs should include assumed failure rates of assets and must set out their view and explain their assumptions.</p>	<p>Replacement costs have been included during the 45-year horizon if options compare different types of asset interaction, i.e. refurb then replace. This is to ensure that options are comparable to deliverability of outputs.</p>

Due to the number of CBA's completed, we have developed an internal database in order to collate the CBA information and cross check to other documents completed.

We can summarise all CBA costs in order to cross check to the Business Plan Data Tables (BPDT) and ensure that there is alignment between what we are submitted in the individual CBA files and the final BPDT.

TOTEX optimisation

The completion of a CBA for a project can be useful to determine the best option to take in isolation for that project; but the collection of all options and data within the CBA's can be further utilised to help develop a whole system optimisation approach.

For final business plan submission, we are investigating the data collected during our CBA completion to better optimise the options chosen on a holistic, TOTEX scale.

INPUT METHODOLOGIES

CBA requires the input of both project costs and benefits in order to determine a Net Present Value (NPV) figure. This is the value that the project is worth to society based on today's monetary value.

As within the CBA guidance², where applicable we have utilised the NARMs methodologies in order to calculate benefits. This is to best align our CBA to any Monetised Risk calculated figures.

Costs

Costs for projects are well understood across all areas, based on our delivered rates for ED1, less an efficiency challenge where applicable. These input costs have been further explained in our Cost Confidence Appendix, 'A_19.1_Appendix B – Cost Confidence Assessment'.

With construction type CBAs covering specific asset types, SSE have utilised these historic unit rates with efficiency to ensure our cost base is efficient.

CBAs that include more bespoke types of expenditure, such as IT or Environmental projects have costs based on a mix of externally benchmarked rates and RIIO-ED1 delivered unit rates.

Avoided DNO costs

Avoided DNO costs are DNO specific costs that have been reduced due to the option being chosen.

Such examples are a reduction in committed Inspection and Maintenance costs due to the installation of a new, more efficient type of asset. It could also be due to a reduction in headcount caused by the option chosen.

Avoided DNO costs are a change in cost related to the baseline scenario. If the cost is not one that is incurred if the project does not occur, then it is not included as an avoided DNO cost.

Losses (and subsequent CO2 impact)

Losses within Distribution are related to the energy that is lost while it passes through our assets. In many cases we can propose to replace our assets with a lower loss type intervention, in order to generate environmental benefits.

Reduced losses are calculated based on the manufacturer verified improvement in asset efficiency, which is used to determine the MWh improvement annually.

² https://www.ofgem.gov.uk/system/files/docs/2021/04/riio-ed2_cba_guidance.pdf

This figure has been input to the CBA which includes a standard calculation to monetise these reduced losses, along with the subsequent CO2 impact.

For draft business plan we have identified the main areas where we believe reduced losses would take place, and expect to undertake further network analysis before final business plan submission to help better identify Losses improvements.

Customer Interruption & Customer Minutes Lost Benefit

SSE have utilised two separate approaches to determine societal Customer Interruption (CI) and Customer Minutes Lost (CML), depending upon the data available.

CNAIM – Probability of Failure approach

We utilise the Ofgem agreed Common Network Asset Indices Methodology (CNAIM) approach to best align the calculation of societal benefits to a wider alignment in outcomes (*i.e. with Monetised Risk calculation*).

For these and Network Asset Risk Methodology Assets (NARM) type assets, we can identify the Probability of Failure (PoF) of the asset population, and use the movement of Health Index due to intervention to help calculate the change in CI and CML.

To do this, our Condition Based Risk Management (CBRM) system provides the Consequence of Failure (CoF), which includes the impact of CI and CML. Once the movement in PoF is identified, this is then multiplied by the CoF to determine the CI and CML opportunity benefit due to intervention.

Historic data approach

For non-NARM type assets (Overhead Lines, Underground Cables) the industry does not have the same level of Asset information in order to determine a PoF, i.e. underground cables, etc.

Instead, actual fault data is utilised as reported and verified by Ofgem via Regulatory Reporting submissions systems in order to determine existing performance.

We then determine what movement would be caused in CI and CML based on the intervention utilising expert judgement.

When historic data approaches are utilised, full explanation of the rationale is included within the corresponding EJP.

Environmental and Safety

Similar to CI and CML benefits, utilising assumptions within our CBRM system and CNAIM we can determine the benefits identified for Environmental (*Oil leakage and CO2 emissions*) and Safety areas.

The increased/decreased PoF is used to determine the number of times an environmental or safety event occurs. The consequence of this failure as determined per CNAIM is then utilised to determine the relative metric.

Monetised Risk - memo

The input of monetised risk is used to help reconcile between the CBA and NARM BPDTs, as per Ofgem CBA guidance³ paragraph 4.4.

The CBA calculates the Monetised Risk by multiplying the number of assets intervened multiplied by the expected Monetised Risk for the particular asset, as calculated within the CNAIM.

As mentioned within the Ofgem guidance, the Monetised Risk figure is a memo item and does not impact on the NPV calculations.

CBA APPRAISAL

Once CBAs are completed they need to be interpreted in a common way in order to determine the preferred option to take forward.

Net Present Value

The CBA has calculated a Net Present Value (NPV) in order to represent the value of the options to society as a whole.

Net Present Value takes into account the cash flow expected of the project options, and discounts the outcomes to be reflective of a consistent time value of money, in the case of the RIIO-2 CBA the time value of money at the start of the ED2 period.

So, to determine the financially preferred option, the most positive (or least negative) NPV is the best choice to make.

Option Comparisons

Within the Ofgem CBA template on the Option Comparisons tab, SSE have added some visuals to help portray the flow of NPV across the standard 45 year horizon that is assumed within the “Spackman” modelling.

The trend charts show both the trend of NPVs for all options, as well as a view against the option deemed “Do Minimum”, which is that of the lowest spend within ED2.

The views help to present to the audience which option generates the best outcome for society as a whole.

³https://www.ofgem.gov.uk/system/files/docs/2021/04/riio-ed2_cba_guidance.pdf

Choosing the “Adopted” Option

Ofgem have highlighted within the CBA guidance⁴ that CBAs should not be used mechanistically, and therefore may include an element of judgement as part of the submission.

As such an explanation of CBA options and reasoning behind the “Adopted” option is provided within the corresponding EJPs.

APPENDICES

The appendices provide additional detail around specific elements within the SSE Distribution CBAs.

Table 2 – CBA Parameters

Parameter	Value	Comments
Pre-tax Weighted Average Cost of Capital	3.01%	Based upon latest Ofgem assumptions on financiability. Potential to be updated prior to final business plan submission.
Discount rate	<= 30 years – 3.5% >30 years – 3.0%	Based on HMRC Green Book on advice from Ofgem Guidance.
Safety Discount rate	<= 30 years – 1.5% >30 years – 1.286%	Based on HMRC Green Book on advice from Ofgem Guidance.
Assumed Asset Life	45 years	Ofgem guidance
Capitalisation Rate	70%	Based upon latest internal financiability workings. Potential to be updated before final business plan submission.
Losses	£58.17/MWh	As per ED1 rates, updated for inflation to 20/21 monetary value.
CI / CML	CI £18.55 CML £0.45	As per ED1 rates, updated for inflation to 20/21 monetary value.
Oil Leakage	£43.35/litre	As per ED1 rates, updated for inflation to 20/21 monetary value.

⁴ https://www.ofgem.gov.uk/system/files/docs/2021/04/riio-ed2_cba_guidance.pdf - paragraph 5.2