

# CBA MODEL WITH SROI INTEGRATION

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# 1 Introduction and purpose

Cost-benefit analyses (CBA) underpin decisions made by DNOs which have profound consequences for consumers – whether through bills, the service they receive (e.g. interruptions or the availability of connections), or wider societal benefits such as health, safety, and environmental effects. Ofgem expects DNOs to carry out CBAs to inform a wide variety of decisions, as well as to report on the benefits of past activities.

Ofgem provides DNOs with a standard CBA framework for use during RIIO-ED2,<sup>1</sup> which itself is intended to be consistent with the HMT Green Book.<sup>2</sup> SP ENW has commissioned Frontier to produce a spreadsheet model and accompanying guidance (this document) which builds upon the ED2 CBA to:

- provide additional guidance on the process that teams should follow to produce a robust yet proportionate CBA;
- integrate a set of ‘proxy values’ to incorporate non-monetary benefits (which are especially relevant for SP ENW given its Social DSO Strategy);<sup>3</sup> and
- incorporate general elements of the Social Return on Investment (SROI) methodology.

The aim is to provide teams across SP ENW with the tools they need to make decisions that place the interest of consumers first, with defined goals, targeted activities and measurable success criteria.

This document first provides a brief overview of where CBA and SROI approaches are applied across SP ENW. The guidance and framework are intended to be broadly applicable across all use cases, and potentially across all SP ENW teams. This means that SP ENW will need to carry out customisation and development for specific use cases. The framework has been designed to be flexible and extendible to help accommodate different types of future use.

The remainder of this document provides a step-by-step guide for how to apply this methodology, using a hypothetical case study as an example. Where further information is available in other documentation (such as the Green Book) this is signposted.

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<sup>1</sup> <https://www.ofgem.gov.uk/consultation/riio-ed2-data-templates-and-associated-instructions-and-guidance>

<sup>2</sup> <https://www.gov.uk/government/collections/the-green-book-and-accompanying-guidance-and-documents>

<sup>3</sup> <https://www.enwl.co.uk/globalassets/future-energy/dso/reports/social-dso/dso-social-strategy.pdf>

## 2 Introduction to CBA and SROI

### 2.1 Cost-benefit analysis

**Cost-Benefit Analysis (CBA)** is used to compare the net benefits (i.e. benefits minus costs) of one or more options against a counterfactual which captures the world ‘but for’ the activity in question. This involves expressing the resulting stream of costs and benefits in monetary terms and then applying a discount rate to ‘roll these up’ to a single Net Present Value (NPV) figure per option.

A CBA can be carried out only counting the costs or benefits that are realised by one particular entity (such as SP ENW). By contrast, **social CBA** attempts to capture wider impacts on welfare, including those such as pollution which do not have a direct financial impact. HMT’s Green Book sets out the methodology which public sector bodies should use to carry out a social CBA, including standard ways to monetise various non-monetary impacts. A Social CBA results in a Net Present Social Value (NPSV) figure for each option.<sup>4</sup>

A central principle for social CBA is to exclude transfers of resources between people (for example, redundancy payments). The Green Book states:

*Transfers of resources between people (e.g. gifts, taxes, grants, subsidies or social security payments) should be excluded from the overall estimate of Net Present Social Value (NPSV). Transfers pass purchasing power from one person to another and do not involve the consumption of resources. Transfers benefit the recipient and are a cost to the donor and therefore do not make society as a whole better or worse off.*

*Where transfers may have a distributional impact, it may be appropriate to quantify and show these effects alongside the estimate of UK NPSV. This could involve showing the transfer of equivalent costs or benefits from one group in society to another, particularly when relevant to distributional objectives. It may be appropriate in those circumstances to undertake distributional analysis....*

‘Distributional impacts’ describe how the costs and benefits of an intervention are shared across different groups in society, such as by income, location, or household type. These may be important for many Social DSO investments. Section 11 of this guideline provides further detail on how to apply a distributional analysis to identify and value such effects across different groups.

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<sup>4</sup> This guidance and the accompanying tool use the general term ‘NPV’ for the discounted sum of costs and benefits, regardless of whether these include societal costs and benefits (and are therefore a NPSV) or not.

## Applications of CBA within SP ENW

Ofgem has embedded the CBA principles set out in the Green Book into the way it carries out Impact Assessments for its own activities.<sup>5</sup> Additionally, Ofgem expects DNOs to carry out CBA to support a wide variety of decisions – whether at the programme, project, or asset level. CBAs used by SP ENW can be broken down into two main categories:

- **‘Ex-ante’ or ‘forecast’** CBAs. These are carried out before a decision is taken, in order to inform the decision. For example:
  - to justify significant expenditure or Consumer Value Propositions during business planning or reopeners like the load-related reopener (using the standard ED2 CBA template);
  - when seeking funding for innovation projects (using the Strategic Innovation Fund (SIF) CBA template, which is closely based on the ED2 one); or
  - when deciding whether flexibility or reinforcement is best suited to resolve a given network constraint (using the Common Evaluation Methodology CBA developed on behalf of the ENA).
- **‘Ex-post’ or ‘evaluative’** CBAs. These are carried out after the decision is taken, when information is available on at least some of the outcomes. They can help confirm whether the decision was correct – and therefore inform future decisions. For example:
  - The annual DSO Performance Panel process, which evaluates DSO activities carried out over the previous regulatory year; and
  - CBAs carried out at the end of innovation projects.

## 2.2 Social return on investment

**Social Return on Investment (SROI)** is a systematic way of evaluating the wider societal outcomes (both costs and benefits) of an activity. It evolved in the 1990s as a way of tracking the social returns of philanthropic activity,<sup>6</sup> and was developed further and popularised in the UK during the 2000s, with the Cabinet Office publishing a guide to SROI in 2009 which is now maintained by Social Value International.<sup>7</sup>

<sup>5</sup> Ofgem (2024), Impact Assessment Guidance. <https://www.ofgem.gov.uk/guidance/impact-assessment-guidance>

<sup>6</sup> Roberts Enterprise Development Fund (2000), [\*Social Return on Investment: Exploring Aspects of Value Creation in the Nonprofit Sector\*](#)

<sup>7</sup> Institute for Social Value (2012), [\*A Guide to Social Return on Investment\*](#)

SROI was developed from and builds on CBA principles. Just like a CBA, SROI involves monetising and aggregating outcomes. The seven principles of SROI<sup>8</sup> can all be applied to a social CBA, and this guidance attempts to incorporate them – they are:

- **Involve stakeholders** – consultation with stakeholders should inform what gets measured and how;
- **Understand what changes** – the ‘theory of change’ (how an activity creates impacts) should be articulated;
- **Value the things that matter** – use financial ‘proxies’ to recognise outcomes;
- **Only include what is material** – information and evidence should be included if it will make a difference to the decisions being made;
- **Do not over-claim** – take account of what would have happened anyway (i.e. the counterfactual absent the intervention);
- **Be transparent** – sources and methods should be documented; and
- **Verify the results** – independent assurance can provide greater confidence.

The SROI methodology also provides a useful approach for building a counterfactual, based on the concepts of *deadweight*, *displacement*, *attribution* and *drop-off* (which are explained in Chapter 9). These may be useful for some (but not all) CBAs, and this guidance describes when and how to use them.

The SROI methodology underpins the guidance produced for DNOs when calculating the Consumer Vulnerability output delivery Incentive (CVI). The proxy bank described in section 8 draws heavily on the DNO common guidance for the CVI. However, some proxies used for the CVI will not be appropriate for a social CBA as they reflect (at least in part) transfers rather than resource costs.

There is one key way in which the SROI methodology departs from a social CBA: A SROI focuses only on quantifying the social outcomes of an activity, and not the private financial returns. This is useful for showing the *additional* social value created by an investment but means that SROI by itself cannot be used to choose between two options (unless they have the same private financial returns).

## 2.3 Applying a social CBA

A goal of SP ENW’s Social DSO strategy is to ‘*Make investment decisions that maximise social benefits in the North West...*’. This implies that social considerations will sometimes

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<sup>8</sup> Institute for Social Value (2012), [A Guide to Social Return on Investment](#)

need to affect the decisions made by SP ENW. In other words, SP ENW will sometimes carry out activities that it would not have done were it not for its social DSO strategy.

As described above, a SROI methodology by itself cannot provide a decision-making tool (although it could be used as part of a multi-criteria assessment which includes social costs and benefits separately to private ones). By contrast, a social CBA takes account of societal costs and benefits in exactly the way as private costs and benefits.

As a social CBA considers both private and social cost and benefits, it is possible to use the same framework to look at these in isolation:

### 2.3.1 Assessing private benefits only

The regulatory framework under which SP ENW operates does not pass through all social costs and benefits to SP ENW. For example, reductions in outages are incentivised through the IIS, however reduced NHS costs are not passed through in a similar way.

SP ENW's social DSO commitment means that in some cases it may wish to carry out activities which have a wider social benefit, despite being suboptimal from the perspective of SP ENW and its shareholders. However, there will inevitably be a limit to this: Ofgem would not want SP ENW to spend large amounts of billpayers' money on activities outside its core purpose.

For larger projects and proposals which are outside the direct scope of the social DSO programme, SP ENW may therefore wish to carry out a private CBA which excludes these societal costs and benefits. We describe how to do this in Chapter 10.

Note that if a project shows a negative private NPV but a positive social NPV this indicates that SP ENW's incentives are to some extent out of line with what is valuable for society as a whole. This may be helpful evidence when making suggestions to Ofgem on what *should* be allowed within the regulatory regime to maximise societal value.

### 2.3.2 Assessing societal benefits only

If desired, the tool could easily be used to look at social benefits in isolation, simply by excluding the private benefits. We describe how to do this in Chapter 10. Dividing the resulting figure by investment costs would produce a SROI figure that could be used to explain the social impact from an investment that has been justified in another way.

### 3 How to use this toolkit

This toolkit sets out a CBA methodology which builds on the standard RIIO-ED2 CBA by:

- Integrating a set of 'proxy values' to incorporate non-monetary benefits and allow a full social CBA to be undertaken; and
- incorporating other elements of the SROI methodology to help define a business-as-usual (i.e. what would happen without intervention by SP ENW).

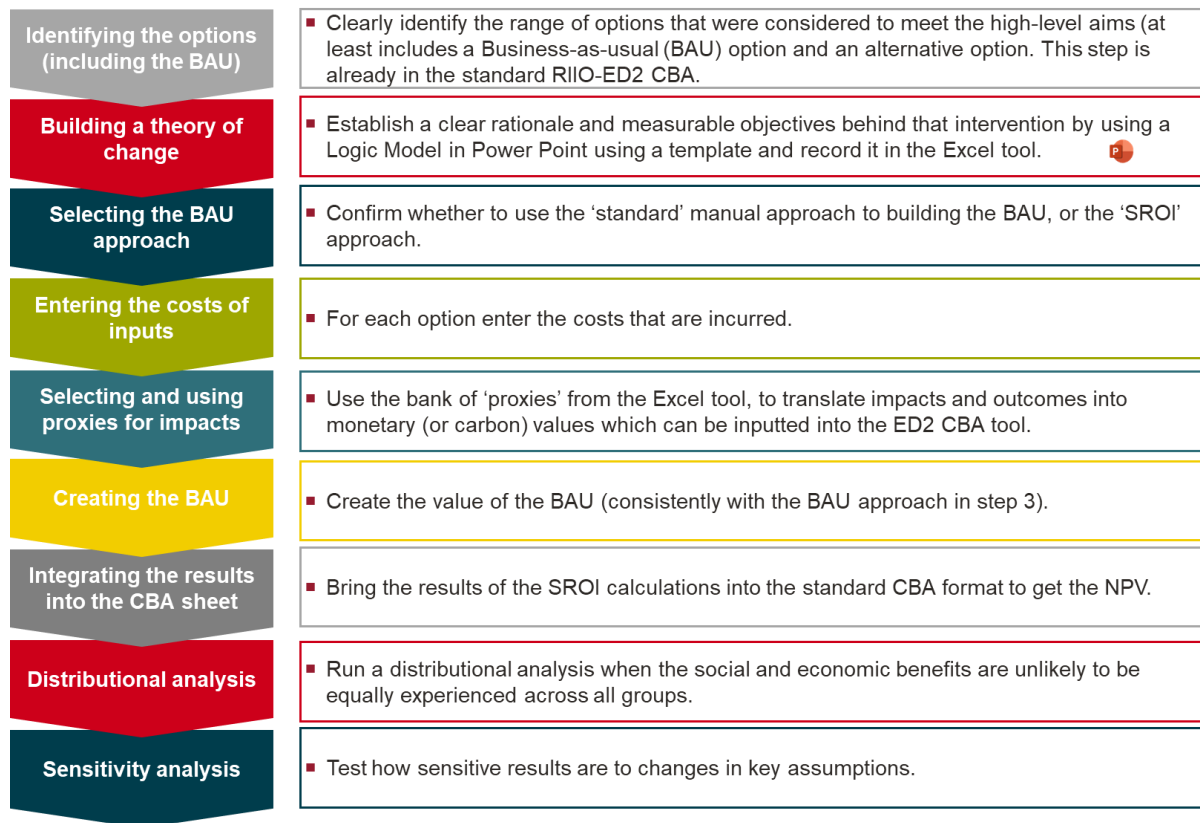
It is designed to be a broad framework, which could be applied across the full range of CBAs carried out by SP ENW – whether forecast or evaluative, and whether at the asset, project, or programme level. This breadth means that, like the Ofgem template itself, SP ENW will need to customise and develop the model for specific use cases. The toolkit has therefore been designed to be as flexible as possible.

Developing a CBA requires drawing on subject matter expertise, as well as appraisal best practice. We have referenced useful documents (such as HMT's *Green Book*) which users should be familiar with and highlighted some key potential pitfalls. However, there are many nuances that cannot be covered by this guidance, and we cannot guarantee that following this guidance in isolation will necessarily result in a robust CBA. It will always be important to ensure that any CBA undergoes quality assurance by an appraisal expert.

The toolkit consists of:

- This guidance document, which provides a step-by-step methodology (see Figure 1 below), using a hypothetical EV charging case study as an example;
- an accompanying PowerPoint template to develop a logic model (described in Chapter 5); and
- the Excel tool itself, which is an extension to the RIIO-ED2 CBA.

**Figure 1** Illustration of the step-by-step methodology



Source: Frontier Economics

### EV charger take-up programme case study

As a way of illustrating the steps described above, we assume that SP ENW is considering providing funding to support a programme involving the installation of Vehicle-to-Everything (V2X)-capable charge points, which can store electricity and feed it back into the grid during peak times.

This programme would serve communities that are both underserved by EV infrastructure and located in areas with known or emerging electrical grid constraints.

## 4 Identify the options

The first step is to clearly identify the range of options that were considered to meet the high-level aims. At a minimum there must be at least two options:

First, a **Business-as-Usual** (BAU) option. This is also referred to by a variety of names such as the counterfactual, status-quo, baseline, do minimum option, or reference option.

According to Ofgem's ED2 CBA guidance,<sup>9</sup> this *'represents status quo; that is the cost of business as usual in the absence of any investment intervention. Where business as usual is not an option i.e. an investment intervention of some kind is required DNOs should choose the option with the lowest investment to represent the baseline scenario.'*

For example, consider a CBA being used to assess flexibility to mitigate over-voltage issues being caused by a generator. The obvious BAU is literally to do nothing. However, if this would not meet Electricity Safety, Quality and Continuity Regulations (ESQCR) standards, then the appropriate BAU would be some form of network reinforcement, rather than doing nothing.

One or more **alternative options** are also needed for the assessment.

- For an 'evaluative' CBA assessing a past decision, the option is simply the programme or project to be evaluated.
- For a 'forecast' CBA informing a decision, the options will usually flow from different ways of addressing some particular issue that needs to be solved.

If there are a large number of options, then it may be helpful to carry out a shortlisting process. Chapter 5 of the Green Book (*Shortlist Options Appraisal*) provides further guidance.

### EV charger take-up programme case study

For simplicity, we assume that SP ENW is considering only one option: investing in an advanced EV charger installation programme. However, if multiple options were available, these would need to be compared against one another.

As this intervention is not required to meet any regulatory requirement, the BAU is **Do not invest in the EV chargers programme.**

Once the options are decided, they can be recorded in the CBA spreadsheet.

<sup>9</sup> [RIIO-ED2 Cost Benefit Analysis \(CBA\) Guidance.](#)

## Using the Excel toolkit

Go to the **Option Summary** tab:

- At the top, fill out the primary driver for the investment. For this case study, this might be a general statement used for all Social DSO projects like *'Enhance SP ENW's ability to meet net zero targets in a way which maximises social benefits, particularly for those at risk of being left behind'*;
- In the table below this, list out all options considered, starting with BAU (which Ofgem refers to as 'Baseline (counterfactual)'). This can be a long-list of options, including those that were ruled out at shortlisting stage; and
- In the table below this, list out the shortlisted options that will be used in the CBA. Do not include the business-as-usual option here.

Now prepare each of the sheets for each option. The CBA book contains a sheet called '**Baseline Scenario**' for the BAU, as well as '**Option 1**' through to '**Option 5**'. Write the name of the option in cell C6 of the relevant sheet.

## 5 Build a theory of change

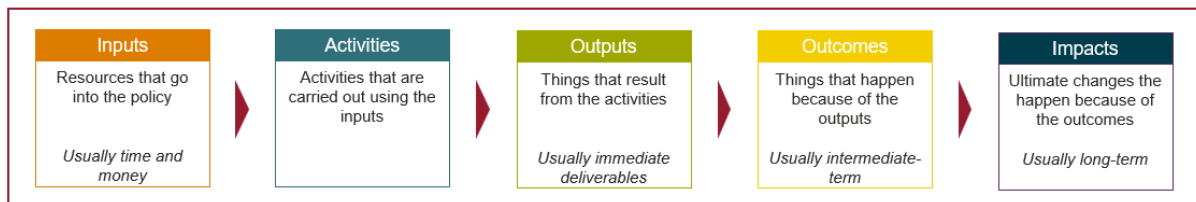
In order to understand the process of change that will result from each option, the Green Book highlights the need to ensure a clear rationale and measurable objectives behind that intervention. This is the ‘theory of change’ that shows how SP ENW’s activities will ultimately lead to societal impacts.

### 5.1 Logic models

A *logic model*<sup>10</sup> is a structured way of showing a theory of change. It maps the causal chain between:

- **Inputs:** What are the resources committed to the activity (e.g. funding, time)?
- **Activities:** What is being carried out with these inputs?
- **Outputs:** What are the immediate deliverables from these activities?
- **Outcomes:** What are the intermediate-term results?
- **Impacts:** What are the long-term results? (These should hopefully lead to societal benefits for different stakeholders).

**Figure 2** Visualisation of the steps of a logic model



Source: Frontier Economics

Setting out a logic model ensures that you have thought through what has to happen for the activity to actually produce impacts and may highlight dependencies that you had not previously considered. It should be a participative process which, where possible, includes engagement with stakeholders involved in delivering the activity or who are intended to benefit from it (the logic model itself can be a very helpful tool to use with stakeholders). The ‘Establishing scope and identifying stakeholders’ chapter of the guide to SROI<sup>11</sup> provides information on how stakeholders might be involved.

If a single option is being considered, then one logic model is required, which will compare the option to the business-as-usual. If more than one option is being considered and they are very different, then you may need to produce more than one logic model.

<sup>10</sup> Note that there is no entirely standardised way to set out a logic model – feel free to adapt the template as you wish.

<sup>11</sup> Institute for Social Value (2012), [A Guide to Social Return on Investment](#)

## 5.2 Further guidelines to build the logic model

Advice on the development of logic models can be found in:

- Chapter 2 (*Evaluation Scoping*) of the Magenta Book,<sup>12</sup> the Government's guide to evaluation;
- Better Evaluation's guide to using logic models;<sup>13</sup> and
- The Tavistock Institute's guide to logic mapping in transport evaluations.<sup>14</sup>

To build the logic model, we suggest starting from the original business or social case for the investment. Engagement with relevant stakeholders should be carried out to explore the logic model further.

One cross-check that may be useful is to think of the private business case for an investment (i.e. excluding social value). Typically, the entries that would appear in a private business case and contribute towards profits should appear somewhere in a logic model:

- The costs (e.g. initial investment or operating costs) that would appear in a private business case will often reflect resource costs (e.g. constructing assets or purchasing energy) which will need to be reflected in a social CBA.
- The revenue for a private business model reflects the way in which its customers are willing to pay for something. This is presumably because they are obtaining a value from the good being supplied. You should think about what value each group of customers obtains, and check if it is in the logic model.

We have provided a template in Power Point with a generalised Logic Model that can be adapted. Below, we have used the EV charger take-up programme case study as an example to set out how you might think through this.

### EV charger take-up programme case study

#### Inputs

Start by considering the resources provided by SP ENW. For this case study, we have assumed that this consists of £75k of seed funding. Any time spent by SP ENW staff could also be quantified, if material.

<sup>12</sup> HMT (2020), [Magenta Book – Central Government guidance on evaluation](#)

<sup>13</sup> <https://www.betterevaluation.org/blog/using-logic-models-theories-change-better-evaluation>

<sup>14</sup> Tavistock Institute (2010), [Logic mapping: hints and tips](#)

You should also include the resources that other entities may need to provide to deliver the activity (if applicable). If this is not obvious, you might estimate the cost of activities. For the purpose of this case study, we have assumed that ten chargers might cost £200k, leaving £125k of costs to be borne by others.

### Activities

The main activity here is to install smart V2G EV chargers (for the purpose of this case study we will assume ten chargers).

Once you have completed the rest of the logic model, it is worth 'looking back' to confirm that the activities can support the outputs and outcomes. We assume that one of the outcomes of this case study is greater resilience by enabling community assets to operate during power outages. This would require chargers to have islanding functionality, and so this should be noted within the activity.

### Outputs

The deliverable of the activity 'installing a charger' is ten installed chargers. However, the purpose of the logic model is to illustrate the difference compared to the BAU – and it's possible that under the BAU at least some of these chargers would be installed anyway. We therefore need to think about how the outcome (the number and type of chargers installed) differs between the BAU, and the option under consideration. At a high-level, there are two possibilities:

- The same type of chargers (V2G) might be installed under the BAU, but later (or maybe in some cases not at all). The outcome is therefore that V2G chargers are installed earlier and in more locations than otherwise would be the case; and
- Different chargers (e.g. cheaper chargers without V2G) would have been installed instead. The outcome is therefore that V2G chargers are installed instead of 'dumb' chargers.

For now, we have listed both in the logic model.

### Outcomes

These reflect the wide variety of things that might happen due to the earlier availability of V2G chargers. For example, greater local EV uptake (replacing ICE vehicles), and the use of V2G to provide local flexibility.

One crucial but less obvious outcome is the benefit to customers for whom the new charger is more convenient than one that they would otherwise have used. We were able to identify this by using the 'private CBA cross-check' described above. A private CBA would include the revenue from people paying to use the charger. This can be divided into the following types of customer:

- Customers who would have otherwise used an ICE vehicle. The presence of the charger means that they can switch to an EV. The value to this group of customers consists of the net cost savings in owning and running an EV compared to an ICE vehicle. These cost savings are resource cost savings which are captured in the logic model.
- Customers who would already have had an EV but charged it elsewhere. The additional value for these customers comes from the fact that the new charger is more convenient. We can monetise it by considering savings in time.

### Impacts

These reflect the ultimate impacts to stakeholders of these outcomes. For example, replacing ICE vehicles with EVs leads to lower carbon and air pollution emissions.

While drawing the links between the different elements of the logic model, you should think of what external dependencies may need to hold for the link to 'function'. We have added one as an illustration: one of the impacts from V2G is reduced network reinforcement costs (if flex means reinforcement can be deferred). However, this will only be the case if the charger is in an area where reinforcement would be necessary.

We would also suggest at this point considering the stakeholders who will be affected by each impact. You can then speak to these stakeholders to better understand the nature of these impacts, as well as if you have missed any.

## 5.3 Elasticities and rebound effects

Economic theory suggests that individuals will consume more of a good if its price is lower. For example:

- In the EV charger take-up programme example, customers who move from ICE vehicles to EVs may have lower fuel costs – and might drive further as a result.
- The 'rebound effect' is well known for heating systems, where interventions which reduce the cost of heating a property (e.g. insulation or moving to a technology with lower running costs) can lead to 'comfort taking' where a customer heats their home more.

The UK Government's supplementary guidance on the Valuation of Energy Use and Greenhouse Gas Emissions<sup>15</sup> notes that these behavioural responses should be taken into account where credible evidence exists, as they can reduce the realised energy savings. However, there will be an offsetting benefit (e.g. more mobility or greater comfort) which would also need to be accounted for.

<sup>15</sup> DESNZ 2012. [Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal.](#)

Appraisers should consider whether rebound effects are likely to be significant. However, in many cases, it may be pragmatic to not include them in quantitative analysis.

### EV charger take-up programme case study

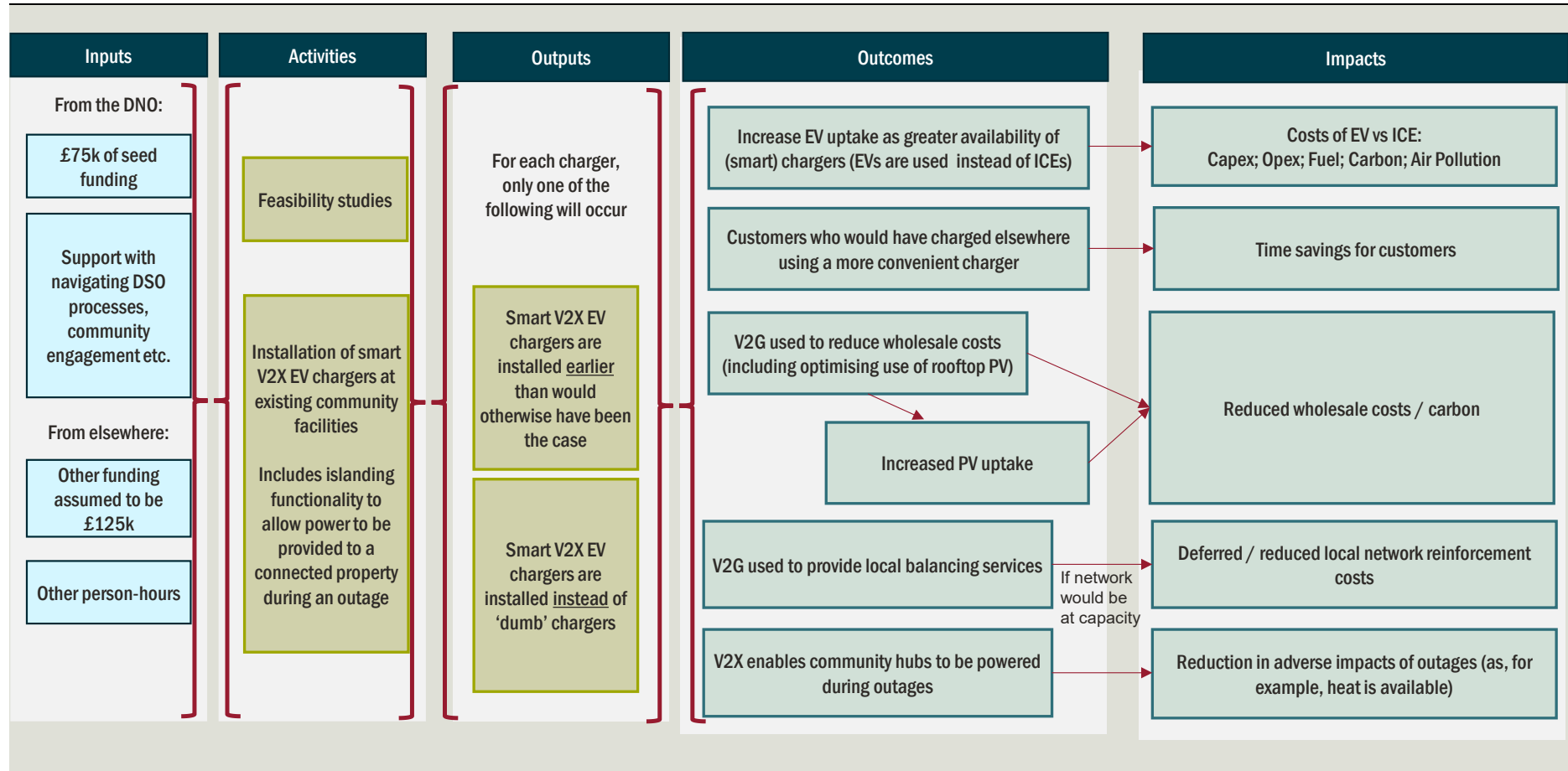
A much more complex analysis might consider the elasticity of mileage with respect to fuel price (i.e. the extent to which EV drivers are likely to drive further after switch from an ICE vehicle). This approach was undertaken in the Government's CBA for the Zero Emissions Mandate.<sup>16</sup>

However, we assume this is likely to be disproportionate for a small programme as the one we are using for illustration and therefore we would only note it but not quantify it.

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<sup>16</sup> UK Gov. DfT 2023. [Zero Emission Vehicle Mandate and CO<sub>2</sub> Regulations](#).

EV charger take-up programme case study



## Using the Excel toolkit

Go to the **LM – Option 1** tab. This contains a space at the top to paste in a copy of the full Logic Model from PowerPoint (you may also wish to record the file path to the full logic model).

Beneath this is a table where you can optionally record a simple list of inputs, activities, outputs, outcomes and impacts (enter these in any order – it doesn't matter if they don't line up correctly). Try to ensure that the outcomes and impacts have short, descriptive names, as these will be used later in the process.

If you have created multiple logic models for multiple options, then duplicate this tab as appropriate.

## 6 Selecting the BAU approach

The user needs to confirm whether to use the ‘standard’ manual approach to building the BAU, or the ‘SROI’ approach.

In a standard CBA, the analyst would determine the costs and benefits associated with the BAU in parallel to doing this for the option under consideration. They would then net the two off to determine how the option compares to the BAU.<sup>17</sup>

The SROI BAU approach provides an alternative to manually describing the BAU. It assumes that:

- There are no investment costs for SP ENW under the BAU (i.e. the BAU is truly ‘do nothing’); and
- The outcomes (and therefore impacts) of the BAU are qualitatively similar to those under the option(s) being assessed, with the only difference being that:
  - the same outcomes are less likely to take place; and/or
  - the same outcomes would take place later.

If the conditions above are met, then it may be appropriate to use the SROI BAU approach. Table 1 provides two contrasting examples.

**Table 1** When may the SROI counterfactual approach be appropriate?

Option	BAU	Is SROI approach appropriate?
SP ENW invests in a project installing insulation in properties with electric heating	SP ENW does not invest in the project	Yes. The BAU has no investment costs for SP ENW. The activity leads to an outcome of ‘more insulation, sooner’.
SP ENW procures flexibility	SP ENW carries out reinforcement	No. The outcomes are very different by nature (under the counterfactual something entirely different is being done, with different impacts).

Source: Frontier Economics

<sup>17</sup> There are more advanced forms of CBA using tools such as real options analysis or least-worst regrets to use multiple counterfactuals to account for uncertainty. These are outside the scope of this guidance.

## EV charger take-up programme case study

Whether the SROI BAU approach is appropriate here depends on which of the two ‘output’ boxes is most likely.

- One possibility is that V2G chargers are less likely to be installed in these areas and there would be no chargers. Or that other third parties will install chargers, but later when the market is more mature. The ‘SROI approach’ would be appropriate here, as SP ENW’s activities are making an outcome more likely and/or bringing it forward.
- A different possibility is that chargers might be installed, but without V2G functionality. This is a qualitatively different outcome. For example, a charger without V2G will always add demand on to the network, while a charger with V2G might be able to reduce peak demand. The ‘SROI approach’ would not be appropriate here, and the BAU would need to be manually described as a separate option.

For the purpose of this case study, we assume that non-V2G chargers would *not* be installed (i.e. no one would install a ‘dumb charger’), and so it is appropriate to use the simpler SROI-style approach.

Whatever approach is selected, it should be logged in the Excel tool (and will subsequently affect how the CBA is built).

## Using the Excel toolkit

Go to cell F14 of the **Option Summary** tab. Enter ‘Yes’ if the SROI-style approach will be used for the counterfactual, or ‘No’ if a counterfactual will be specified manually.

## 7 Enter the cost of inputs

For every option, you will need to enter the costs that are incurred. These will be based on the 'inputs' listed in the logic model.

### 7.1 Entering investment costs

If you are using the 'standard approach' to the BAU, then you will need to enter BAU costs manually. If you are using the 'SROI approach' then BAU costs will generally be zero (as SP ENW is making no investment).

It is important to be consistent in the scope of investment costs which you enter. There are two approaches that can be taken:

- For a standard societal CBA, you would enter **all investment costs, regardless of who incurs them.**
- However, it will often be easiest to **only enter those investment costs which are incurred by SP ENW.** However, if you do this and there are other parties contributing investment to the same project, then will be important to use the 'attribution' functionality discussed in Chapter 9. This will avoid a situation where you are counting all the benefits of the project, but only a subset of the costs.

### Using the Excel toolkit

Costs are entered in the blocks of blue shaded cells towards the top of the 'Option 1' to 'Option 5' sheets. Ofgem's CBA guidance provides further information on the different categories of cost. Costs should be entered as negative numbers (since benefits are positive numbers), in millions of pounds.

If you are using the 'standard' BAU approach, then you should also fill in investment costs for the BAU on the 'Baseline scenario' tab. **The Ofgem CBA template then expects that you will net these costs off the costs that you enter in the option tabs.** You could do this by entering in the gross cost of investment for (e.g.) Option 1, and including a formula which subtracts the corresponding cost line from the 'Baseline scenario' tab.

If you are using the SROI approach to the BAU, then you may not need to fill in the 'Baseline scenario' tab, as the counterfactual will generally be one where SP ENW makes no investment.

## EV charger take-up programme case study

In our example, the DNO would be providing £75k of seed funding for the project. If this was in 2026, you would therefore enter minus 0.075 in cell G18 of 'Option 1'.

In a situation in which the DNO would provide material amounts of other resources (e.g. contributing people's time to advise on the project) then these should be calculated and added to the sheet.

For the purpose of this case study, we will assume that SP ENW is only entering in its own costs (and will therefore need to make an attribution adjustment, described in section 9.3). Alternatively, SP ENW could enter the costs incurred by other investors.

There are no BAU investment costs to fill in.

## 7.2 Optimism bias

For an **evaluative** CBA, you will be entering actual, known costs, and this section is not relevant.

For a **forecast** CBA, you should consider optimism bias – the proven tendency for project appraisers to be overly-optimistic when entering costs and benefits. The Green Book supplementary guidance on optimism bias<sup>18</sup> provides guidance, which can be summarised as follows:

- There are standard, empirically derived optimism bias values to apply to the cost and duration of capital projects (depending on the type of project, and whether it is a standard or non-standard design);
- While appraisers may also understate operating costs or understate benefits, there is less evidence available on this. The guidance suggests instead that sensitivity analysis is carried out to confirm by how much benefits can reduce (or operating costs increase), and the project remain viable. Sensitivity analysis is described in Chapter 12.

Ideally, SP ENW would systematically carry out both forecast and evaluative CBAs of projects. This would allow it to build a database of how optimistic its assumptions are and apply this rather than the standard values.

Any bias relating to benefits is more likely to be in the estimates made by the appraiser 'further to the left' of the logic model (e.g. in estimating how many EVs a project will bring forward) rather than the proxies used 'further to the right' such as the carbon emitted by an ICE vehicle,

<sup>18</sup> [https://assets.publishing.service.gov.uk/media/5a74dae740f0b65f61322c72/Optimism\\_bias.pdf](https://assets.publishing.service.gov.uk/media/5a74dae740f0b65f61322c72/Optimism_bias.pdf)

for which robust evidence is available. The relevant optimism bias will also depend on the circumstances. For example:

- One project might involve providing grants that are used to purchase an EV. The grant is conditional on the EV, so there is no possibility that the grant occurs, and the EV is not purchased. There is no uncertainty for which to apply optimism bias.
- Another project (like the EV charger take-up programme) might develop EV chargers, which indirectly leads to EVs being purchased. The appraiser will need to estimate how many new EVs are purchased because of the charger, and this may be a subjective exercise which could be subject to significant optimism bias. As noted above, we suggest using sensitivity analysis to understand how significant this might be.

### 7.3 Comparison with optimism bias in the CVI guidance

Earlier versions of SP ENW's proxy bank contained a series of optimism bias assumptions on the proxy level (for example, the proxy 'annual savings from switching to an electric vehicle from petrol' had a 25% optimism bias). These figures were built following the approach used for the CVI methodology approach. That methodology is a SROI which aims to encourage DNO to use the most up-to-date data possible by assessing the robustness of each assumption and then applying an optimism bias to benefits.

As explained above, the purpose of optimism bias is to counteract the natural tendency of people developing a business case to overstate benefits. In the CVI methodology, however, many of the benefit proxies are drawn from independent academic or consultancy sources, which may be *uncertain* but are not necessarily systematically *optimistic*, as they were not developed with an appraisal in mind.

For that reason, applying a 'one-size-fits-all' optimism bias to all benefit estimates is unlikely to be appropriate for a social CBA, and is not an approach that Government would typically carry out in this context. Doing so risks systematically *understating* benefits.

In any case, you should document your reasoning clearly in the analysis, explaining both the source of any optimism bias factors used and why they were applied (or not applied).

## EV charger take-up programme case study

For the purposes of this case study, we have assumed that within the EV charger take-up programme a number of similar chargers have already been installed, and so the capital costs are well understood – no optimism bias is necessary as the costs are already based on appropriate evidence.

If this were not the case, then an optimism bias might be appropriate.

While there are many uncertain benefits, we will follow the Green Book supplementary guidance by using sensitivity analysis, rather than applying an explicit optimism bias adjustment.

## Using the Excel toolkit

Optimism bias can be applied by scaling up the investment costs you enter. You can also use the techniques described in Chapter 12 on sensitivity analysis.

## 8 Selecting and using proxies for impacts

Once the outcomes and impacts have been identified with the use of the Logic Model, they need to be valued in monetary terms. The accompanying Excel tool contains a bank of ‘proxies’ to translate impacts and outcomes into monetary (or carbon) values which can be inputted into the ED2 CBA tool.

There are almost 500 proxies in the bank. These proxies have been gathered from a wide range of sources previously used by SP ENW, and a number of additional proxies have been added as part of this work. Frontier has carried out a ‘light touch’ review to consider how each category of proxies could be used, and whether there are any issues to bear in mind when using it. However, unless specifically indicated for a particular proxy, we have not reviewed the source and cannot warrant that all proxies in the list are necessarily the most appropriate values to use in all circumstances.

For some CBAs, you may find that an appropriate proxy is not available, and one will need to be found. We would encourage that you add it to the proxy bank (along with any required caveats) so a consistent proxy can be used in future CBAs. Note that this will require maintenance of a common proxy bank (this could also include regularly reviewing proxies – we suggest that a record is kept of how often different proxies are used, so this review process can be focussed).

### 8.1 Types of proxies

The proxies have been divided into types based on what level of the logic model they are operating. This can be helpful to avoid double-counting, as well as being clear regarding which proxies produce output in pounds, and which produce output in terms of tonnes of carbon:

**Table 2** Types of proxies

Type of proxy	Description
Impact > Monetised value	These are proxy values which turn a high-level impact (e.g. consumer time, air pollution, or illness) into a monetary value which can be used in the CBA.
Outcome > Impact > Monetised value	<p>These translate an outcome (e.g. ‘consumers receive advice on mould’) into an impact (e.g. on health) and hence into a monetised value.</p> <p>In many cases these will be the same impacts that are covered by the proxies above. However, where these outcome-based proxies are available, they can reduce the amount of analysis that needs to</p>

Type of proxy	Description
	be carried out (in this example, it is no longer needed to gather evidence on how advice on mould translates to health outcomes). It is important not to double-count. E.g. if the proxy described above is used, then you should not also use the health proxies which account for the same impact.
Outcome > Impact (monetary)	These proxy values turn an outcome into an impact which is by itself already in monetary terms. For example, turning heat pump uptake into additional capital costs, or reduced generation costs.
Outcome > Impact (carbon)	These proxy values turn an outcome into an impact which is in terms of carbon emissions.

Source: Frontier Economics

## 8.2 Resource costs and categories of proxies

As described in Chapter 2, a key principle of social CBA is that only resource costs and not transfers should be counted. The distinction between the two is that:

- A **resource cost** makes some real input or amenity scarcer (or more plentiful) for society. For example, the cost of a vehicle is a resource cost, as it embodies materials, labour etc. which could otherwise be used for something else.
- A **transfer** is a payment from one person or organisation to another that does not make society as a whole better off. For example, a grant payment to a customer to help them purchase a vehicle is not a resource cost as it simply transfers resources from the grant giver to the customer. Transfers may still have a distributional impact, and this is explained in chapter 11 of this document.

The proxy bank in the model has been divided into a large number of categories of similar types of proxies. The table below determines, for each type of category, whether or not a proxy represents a resource cost and therefore should be included in the analysis. Notes providing additional guidance for each of these categories are included in the Appendix B to this document.

**Table 3** List of proxy categories

Category	To be included in the CBA	Category	To be included in the CBA
Consumer - cost of time	Yes	Energy - carbon values	Yes

<b>Category</b>	<b>To be included in the CBA</b>	<b>Category</b>	<b>To be included in the CBA</b>
Consumer - health and wellbeing	Yes	Energy - Long run variable costs (LRVC)	Yes
Consumer - other costs	Yes	Other environmental impact - Carbon emissions from avoided or recycled materials	Yes
Consumer tech - capital costs (Capex)	Yes	Other environmental impacts - Biodiversity	Yes
Consumer tech - carbon emissions	Yes	Other environmental impacts - Social costs of pollutants	Yes
Consumer tech - fuel/energy savings	Yes	Public sector - NHS financial costs	Yes
Consumer tech - operating costs (Opex)	Yes	Public sector- Financial costs	Yes
Economic and social value - Volunteering and charities value	Yes	Unknown	Yes
Economic and social value - Wage premia from qualifications	Yes	Consumer tech - bills impacts	No
Electricity system - cost of outages/interruptions	Yes	Economic and social value - Gross Value Added (GVA)	No
Electricity system - network reinforcement carbon	Yes	Economic and social value - Other transfers	No
Electricity system - network reinforcement cost	Yes	Public sector - Fiscal costs of qualifications	No
Electricity system - wholesale costs	Yes	Public sector - Fiscal transfers	No
Energy - carbon emissions	Yes		

Source: Frontier Economics

In the table above, there are categories of proxy which are transfers (and therefore will not generally be appropriate to use within a social CBA):

- **Fiscal transfers** such as tax or benefits;
- **Other transfers** such as debt relief or food vouchers.

Additionally, there are two categories of proxies that contain a mixture of resource costs and transfers:

- **The net fiscal cost of qualifications** (i.e. the cost of providing a course, less the resulting higher tax take). The cost of providing a course *is* a resource cost, however the tax take is not – and would ideally be separated. If these proxies are used as-is, they will tend to understate the societal costs;
- **Bill impacts** to consumers of actions such as installing insulation or a heat pump. Many elements of the bill are broadly reflective of societal costs and so, in some instances, it may be appropriate to use this measure where no other proxy is available. However, bills also include transfers (for example, an individual who reduces their consumption will pay less towards the upkeep of the network, even though those costs are fixed). Bills are also not always cost-reflective (e.g. gas bills do not include a value of carbon emissions, while electricity bills do). Where possible, we would recommend that the impacts of technology uptake are assessed by separately considering:
  - The capital cost of the technology (e.g. a heat pump rather than a gas boiler) – before the impact of any taxes and subsidies (which are transfers);
  - costs of fuel as well as any other variable costs (the proxy bank includes DESNZ's Long-Run Variable Cost of electricity and road fuel for this); and
  - carbon emissions.

Finally, there is a category of proxies for Gross Value Added (GVA) which should not be included in a standard CBA, as described below.

### 8.3 Treatment of GVA and jobs

Gross Value Added (GVA) represents the value of goods or services produced (e.g. by a firm or a region) less the costs of the inputs required. The Green Book is explicit that GVA effects should *not* be included in a CBA, and explains because it is a macroeconomic indicator, not a measure of real resource use. Intuitively, even if activities by SP ENW support some economic activity, without SP ENW's support the resources used to support that activity would be deployed elsewhere in the economy.

The same logic applies to the creation of new jobs, which should not be included in a social CBA.

What can be included are *productivity* effects, such as people moving into more efficient jobs or firms collaborating more effectively, which can represent genuine resource impacts if objectively evidenced. For example, if a project leads to additional workers receiving a qualification, the wage premia they receive should represent a real increase in productivity and can be included in a social CBA (using the proxies in the ‘Wage premia from qualifications’ activity. These sorts of impact are about getting more output from the same resources (employees, in this case, although similar logic applies other productive inputs like machinery), rather than moving resources around.

Despite this, it has become increasingly common to report the number of ‘jobs and GVA supported’ by programmes or interventions. This does not mean that these jobs and GVA are additional in a macroeconomic sense but rather provides a way of describing the labour market impact of a policy or investment. For example, you might report that the rollout of new EV chargers supports 1,500 jobs through installation, maintenance, and supply-chain activity, without claiming that these are newly created positions. If such figures are calculated, they should be presented *alongside* the NPSV of the intervention, and should *not* be monetised, added to other benefits, or interpreted as creating knock-on effects.

It is also appropriate to consider local employment effects when carrying out place-based analysis, which is described in the appendix.

## Using the Excel toolkit

The list of proxy categories can be found on the ‘Categories’ tab.

### 8.4 Entering the amount of an outcome or impact associated with a proxy

The model user should go through the logic model, starting at the top, selecting and populating appropriate proxy values for every impact.

Each proxy converts one unit into another (for example, ‘numbers of EVs’ into ‘pound cost’ or ‘tonnes of carbon’. The model user will need to create assumptions and calculations which produce the ‘input’ unit (e.g. estimating the number of EVs). This may involve a significant amount of work (the tool itself cannot carry out these calculations as they will be different for every CBA, and the tool is designed to work across all activities that SP ENW might carry out). We therefore suggest starting with as simple a model as possible. For example, you could exclude impacts that you think are unlikely to be material – if the resulting CBA is positive, then there may not be a need to populate them. This includes impacts where the deadweight, displacement or drop-off is likely to be high (see Chapter 9).

You should consider the **duration** of time over which to enter data. In general, this should match the lifetime of the assets that are being invested in. It is also important to check the **price base** of proxies to ensure that they are consistent. The tool has a functionality to inflate the prices (whenever the price base of the proxy from the proxy bank is known), by using the data in the original tab 'Fixed Data – Inflation'.

## Using the Excel toolkit

Each 'Option' sheet has an associated 'SROI' sheet to enter impacts:

- Use columns C to E to enter the name of an outcome, and the name of an impact produced by that outcome;
- Use column F to specify whether the impact is 'private' or 'social'.
- Note that if it is difficult to find a particular proxy, you can search through the 'ENW Proxy Bank' sheet and copy the name of the proxy in directly. Once you have selected a proxy, the following columns will tell you:
  - The type of proxy (as per the table above);
  - Whether the proxy corresponds to a resource cost for use in a social CBA;
  - Any particular issues that Frontier has flagged that you may wish to take account of;
  - Where known, the price base of the proxy value;
  - The unit of outcome or impact that you need to provide inputs in (for example 'people' or 'EVs').
- The following columns are arranged by year. Enter in the corresponding outcome/impact (e.g. the number of extra EVs each year) in columns O to BO;
  - The tool contains one 'working' sheet per option to carry out any calculations you need to produce this input. Feel free to add more sheets if more complex requirements are required. We suggest that, where possible, you order such calculations in a consistent way to the other spreadsheets (with years in adjacent columns) to ease the process of incorporating the results.

The list of proxies (on the ENW Proxy Bank) tab and categories are designed so that you can add to them. As described above, we suggest that a central process is established for maintaining this list.

## EV charger take-up programme case study

In this section, we have worked from the top to the bottom of the logic model, describing an approach that might be taken for each impact.

All these benefits would be entered for the lifetime of an EV charger (say, 20 years) so as to match the investment costs.

### **Chargers encourage users to move from ICE to EV -> Costs / carbon etc.**

The model user will need to come up with an estimate of how many drivers who would otherwise have driven an ICE vehicle will take up an EV, due to the presence of a fast charger. This could be done in a number of ways, which vary in complexity and robustness. For example:

- A quick 'rule of thumb'. E.g., an estimate of the total number of EVs using a typical rural charger might be gathered, and some small percentage of these (e.g. 5%) assumed to be additional – this could then be subject to sensitivity testing, to determine whether more complex analysis is warranted;
- Academic literature (e.g. there might be a study on the impact of nearby fast chargers on EV adoption);
- Empirical analysis of previous similar projects (e.g. surveying individuals using similar chargers and asking them what proportion of them took up an EV due to the presence of the charger).

This figure could be used with the following proxies to calculate carbon and air pollution (and therefore health) impacts:

- New proxy for 'Increased upfront cost from EV w.r.t ICE';
- New proxy for 'Annual fuel savings from EV with respect to ICE vehicle', in line with the explanation above;
- New proxy for 'Annual carbon content savings from EV with respect to ICE vehicle', in line with the explanation above;
- New proxy for 'Annual maintenance costs savings from EV with respect to ICE vehicle'; and
- Existing proxy for 'Total health benefits from EV adoption'.

### **Additional PV uptake -> Costs / carbon etc**

The benefits of additional PV uptake could be calculated in a similar way for the EVs: An estimate would need to be made of the number of sites with a V2G charger installed that will have PV installed as a result (perhaps based on data from previous projects). Relevant proxies

would then need to be selected to account for the cost of the PV, as well as the benefits (in terms of reduced carbon and fuel costs).

- We have added to the proxy bank data on 'Installation costs of small-scale PV', 'Construction costs small-scale PV' and 'LCOE for small-scale PV'.
- The proxy bank already had a proxy for 'Carbon benefits from PV uptake' that could be used, ensuring no other proxy account for the same impacts.

We have also added two new proxies to the proxy bank to support users who wish to account for the wider system benefits that arise when renewable generation displaces conventional gas-fired generation. The first proxy 'Gas Generation Marginal Cost' captures the reduction in wholesale electricity costs resulting from lower marginal generation costs when renewables enter the system. The second proxy 'Long-run marginal electricity emissions factor - Generation based' reflects the associated carbon savings, recognising that renewable generation avoids the emissions that would otherwise have been produced by gas plant. These are the same inputs used by SP ENW in its DSO Performance Panel submission to quantify the benefits of connecting additional renewables earlier.

### **V2G balancing services -> Reduced reinforcement costs**

This will be extremely site-specific: there will only be a saving in reinforcement costs if the presence of the V2G charger is sufficient to postpone or avoid reinforcement that would otherwise be required at the particular site. Capacity maps and DFES projections could be used to help understand this.

For the purpose of this case study, we have assumed that five of the sites would have required reinforcement at the secondary transformer in 2027, but with the V2G charger would only require reinforcement in 2029. The relevant proxies are *Secondary reinforcement cost* and *Secondary reinforcement embedded carbon*. These require units in terms of the number of sites reinforced. We enter 5 for 2027 (as five fewer sites would be reinforced then), but -5 in 2029 (as the reinforcement is only postponed, not entirely avoided).

### **V2X enables community hubs to be powered -> Increase in wellbeing**

Monetising these impacts would require gathering evidence on the likelihood of an outage where a 'heat hub' would be helpful, the number of consumers who would benefit, and the monetary value of the benefit per customer.

There is not a standard proxy for this, and so one could be estimated, and then subject to sensitivity analysis.

As a starting point, the model user could use the proxy called *Reducing stress during an outage* from the proxy bank, however, the value for this proxy is derived from the average cost of a stress management course, so may not be appropriate.

Alternatively, we suggest using the CI and CML values from the Ofgem template to estimate the benefit of mitigating, for example, a 12-hour outage. The heat hub will not entirely mitigate the consequences of the outage (customers can stay warm, but need to leave their homes), so this benefit could be scaled down to reflect the reduced benefit compared to entirely avoiding the outage. E.g. as a starting point it could be assumed that the benefit is a quarter of the benefit of avoiding the outage entirely.

**Customers use new charger -> Time savings from more convenient EV chargers**

Users may benefit from more convenient charging, e.g. because the charger is closer, which can be valued as the time saving for people who would have otherwise used a different charger. This can be calculated from the time saved per charge (e.g. based on rough analysis of the next closest charger to the community), and an assumed number of charges per person per year.

## 9 Create the BAU

As described in Chapter 6, there are two approaches that can be used to create the BAU in this toolkit:

- If you are not using the 'SROI' approach, then you will need to create a new 'SROI' sheet for the BAU and enter in the impacts and outcomes under the counterfactual. You can then proceed to Chapter 10;
- If you are using the 'SROI' approach, then you will need to follow the steps described in this Chapter, to account for *deadweight*, *displacement*, *attribution*, and *drop-off*.

This Chapter provides a brief overview of each of these concepts, as well as practical tips for applying them within the toolkit. For a more detailed overview, please refer to Chapter 4 of the guide to SROI.<sup>19</sup>

### Using the Excel toolkit

Deadweight, displacement, attribution and drop-off can be entered in columns FW to GA of the SROI tabs.

#### 9.1 Deadweight

Deadweight relates to the amount of an impact<sup>20</sup> which would have occurred even if the activity had not taken place.

For an **evaluative** CBA, you may have already filled in the SROI sheet using absolute numbers of outcomes and impacts (e.g. the total observed number of EVs in the area following an intervention). It may then be possible to infer what might have happened without the activity from:

- **Other similar areas.** For example, if you were carrying out an evaluative CBA of the EV charger take-up programme and looking to calculate the deadweight for the 'Additional EVs' outcome (and the resulting impacts), you might look at other similar areas and see how much their EV uptake increased in a year;
- **Previous trends.** For example, you might look at the trend in EV uptake in the given area for previous years and assume that this would continue.

<sup>19</sup> <https://static1.squarespace.com/static/60dc51e3c58aef413ae5c975/t/60f7fa286b9c6a47815bc3b2/1626864196998/The-SROI-Guide-2012.pdf>

<sup>20</sup> The SROI guidance uses the term 'outcome', as it defines these terms slightly differently.

Note that there are more sophisticated techniques for carrying out this type of ‘quasi-experimental analysis’ which are outside the scope of this guidance.

For a **forecast** CBA, the SROI sheet has likely been filled in using the expected *change* in outcomes and impacts (for example, the expected *additional* number of EVs in the area). You can estimate the deadweight by working through the logic model from the activity to the impact, and considering at each stage whether, even without the activity, the resulting stages might occur. A worked example is presented below.

**Caution:** In some cases, the impacts that would occur in the absence of the intervention would require costs to be incurred *which would not be incurred had the intervention not gone ahead*. If you apply deadweight (or drop-off to reflect increasing deadweight) to the benefits, without also including these costs, you may under-estimate the benefits of the intervention. The EV charger take-up programme case study for drop-off below explains this in practice.

### EV charger take-up programme case study

The activity from the EV charger take-up programme is that the organisation installs EV chargers in 2026. We therefore need to think about how things may differ if the programme did *not* install an EV charger in 2026.

Following the logic model, we come to the output ‘*Smart EV chargers installed earlier than they would otherwise have been*’. We therefore need to ask whether the output of a smart EV charger installed in 2026 could happen absent the activity.

For simplicity, we assume that the EV charger take-up programme will have sought out an area that it considers it unlikely to have a similar charger installed in the immediate future. Given this, it is very unlikely that another charger would be installed in 2026. So far, the deadweight is zero.

Following the logic model further, we come to ‘*Greater EV uptake*’. In practice, increased EV uptake could occur without a smart charger being installed. However, the estimate we made of the number of additional EVs in the previous chapter was already intended to capture only the *additional* EVs due to the presence of a fast charger. There is therefore no further deadweight – which remains zero for the impacts arising from additional EVs. A similar logic holds for the other components of the logic model.

## 9.2 Displacement

Displacement relates to by how much an impact in one area simply displaced the impact elsewhere (and so the overall impact across GB is neutral).

## EV charger take-up programme case study

Most of the impacts we have considered are unlikely to have a material displacement effect (for example, the fact that EVs were taken up in the areas with the chargers is unlikely to mean that fewer EVs were taken up elsewhere).

### 9.3 Attribution

Attribution relates to the proportion of impacts which do not relate to SP ENW's activities. If SP ENW is only responsible for a percentage of the inputs, then the CBA would be biased towards showing a positive result if this fraction of the costs were compared to the entire set of benefits. It is therefore important that either:

- The input costs you include (see Chapter 7) include *all* of the inputs – including from organisations other than SP ENW; or
- you use the attribution value to scale down benefits to the match.

## EV charger take-up programme case study

We have assumed that SP ENW is contributing £75k, but that the overall activity costs £200k. If we are only including SP ENW's investment costs (see Chapter 7) then we must scale down the benefits. Attribution will therefore be 75% for all impacts.

### 9.4 Drop-off

Drop-off relates to the duration of an impact over time. This is entered as a percentage figure showing the decline in the impact every year. This might be either due to:

- the impact itself lessening (e.g. the benefits of a one-off educational programme declining over time); or
- increased deadweight or displacement over time (however note the caution above relating to deadweight).

## EV charger take-up programme case study

Following the logic for displacement, we will concentrate on drop-off at the outcome level of the logic model. Every year, it becomes more and more likely that, absent EV charger take-up programme, a charger would have been installed anyway. We could include this as a drop-off. For example, a drop-off of 10% effectively assumes that every year, there is a 10% chance of a charger being installed under the BAU – and therefore by 2040 (when EV uptake is expected to plateau) there would be over a 75% chance that a charger is installed.

However, the ‘caution’ point above applies here. If we reduce the benefits by 10% each year to reflect the growing likelihood that a charger would have been installed anyway, we should also recognise the corresponding costs that would arise in the absence of EV charger take-up programme. In other words, under the business-as-usual scenario, another organisation would incur its own investment and installation costs to deliver that charger. Assuming that there is only room for one charger operator in each area, these costs would not materialise once the programme installs a charger, as the investment has already been made. Failing to include these offsetting costs while reducing the benefits would bias the CBA against the programme.

The simplest way to solve this issue is to not include any deadweight (or any drop-off to account for increasing deadweight). This will tend to overstate the overall NPSV. However, the CBA will still give the correct sign (positive or negative) on the assumption that costs and benefits remain the same every year.

In practice, this is not the case (e.g. carbon prices increase, and so the benefits of taking up an EV increase over time). A more complex but correct adjustment would be to manually apply a ‘drop-off’ to the investment costs, to reflect the way that, over time, it is more likely that an alternative investor would build the charger.

## 10 Integrating the results into the CBA sheet

The toolkit is based on the standard RIIO-ED2 CBA. It is therefore necessary to reflect the results of the SROI calculations into the standard CBA format, and we describe how to do this below.

The type of CBA you wish to carry out will affect the figures which you carry over. For a full **social CBA**, you should copy over all of the costs and benefits associated with all impacts (assuming they relate to resource costs).

However, many societal benefits and costs will not be reflected in the returns to SP ENW. As a Social DSO, it may be desirable to carry out projects with a high social value. However, you may also wish to carry out a **private CBA** to confirm that SP ENW will not incur an excessive cost for which it will not currently be compensated through price controls. To do this, simply exclude all benefit lines which are not either a direct cost to SP ENW (such as network reinforcement costs), or reflected through the price control (for example, customer interruptions as measured by CI and CML).

The tool could also be used to show the value of an investment to a specific stakeholder, by only including costs and benefits (including transfers) that affect that stakeholder.

## Using the Excel toolkit

The output of the SROI tabs can be found in table 'Summary benefits with SROI methodology' at the top of the tab 'SROI – Option 1'. This table presents values for:

- 'Private' benefits, which are automatically copied into row 79 in tab 'Option 1';
- 'Social' benefits, which are automatically copied into row 80 in tab 'Option 1'. The user can optionally choose to not include this type of benefits by choosing 'No' in cell D6. If that is the case, the social benefits will not be copied in tab 'Option 1' and the model will report the private NPV.
- Carbon values, which are automatically copied into row 96 ('Reduced / increased emissions (not associated with losses)' in tab 'Option 1');

In principle, additional proxies could be produced which translate outcomes into the other types of value on this sheet (e.g. probabilities of major injuries), in which case they could be copied into the relevant rows.

Be careful to ensure that all values are the right sign: The CBA model expects benefits to be positive, and costs to be negative.

If you are using the 'standard' and not 'SROI' BAU approach, then you will need to net off the figures (as the CBA model expects all figures in this sheet to already be net of the BAU). To do this, populate the 'baseline' sheet with the BAU. You can then, in the relevant 'Option' sheets, insert a formula to subtract the BAU values.

The final Net Present Social Value figures for every option are shown in the 'Whole Life NPV' column of the table at the bottom of the 'Option Summary' sheet.

## 11 Distributional analysis

The net present value calculation in a 'standard' CBA implicitly assumes that society values benefits and costs the same no matter which individuals or organisations they fall on. However social and economic benefits are not always experienced equally across all groups. Some projects or programmes may have redistribution as a core aim (e.g. transferring value from billpayers as a whole to vulnerable customers), and this would not be considered in a standard CBA. Distributional analysis allows you to assess these sorts of impacts.

In this section we describe three ways of using the CBA framework to understand these impacts. From the simplest to the most complex, these are:

- qualitatively understanding distributional impacts;
- quantifying impacts by group; and
- applying distributional weights.

### 11.1 Qualitatively understanding distributional impacts

For any CBA, it is worth at least *describing* the potential distributional impacts. Trace through the logic model and consider whether any of the impacts or input costs<sup>21</sup> are likely to be borne disproportionately by certain groups. Key groups to think about include:

- Protected characteristics covered by The Equality Act 2010. That is: age; disability; gender reassignment; marriage and civil partnership; pregnancy and maternity; race; religion or belief; sex; and sexual orientation.<sup>22</sup>
- Consumers in vulnerable circumstances. For example, those on the Priority Services Register, or at risk of fuel poverty. SP ENW's vulnerability strategy<sup>23</sup> should be consulted for a more complete list of potentially vulnerable groups.
- Groups with significantly different levels of income.

Through the logic model, the user can identify groups that are likely to be disproportionately affected by the option (the Green Book provides further indications about what groups these are).

This analysis can then inform whether further quantitative analysis is required. According to the Green Book, the depth of distributional analysis should be proportionate to the likely scale of redistribution:

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<sup>21</sup> For many SP ENW projects, the input costs are likely to come from billpayers as a whole.

<sup>22</sup> [Equality Act 2010](#)

<sup>23</sup> ENWL (2021), [Business plan Annex 8: Electricity users in vulnerable circumstances](#)

- *Where the impact on those affected is minor it may be sufficient to ensure that decision makers are made aware of the effect and its likely scale, and possible options for avoidance or mitigation.*
- *Where it is a significant collateral effect of another policy a straightforward monetary analysis may be required. This is described in the following section ‘**quantifying impacts by group**’.*
- *Where redistribution is a policy objective such as payments under the welfare system or if it is highly significant in terms of the impact on incomes and welfare of those affected then a weighted and equalised income distribution analysis may be justified. This is described in the section ‘**applying distributional weights**’.*

### EV charger take-up programme case study

An assessment against the groups described above should be carried out. However we have assumed that this case study is neither targeting specific groups, nor likely to disadvantage vulnerable customers or those in protected groups.

The main group of beneficiaries of this programme will be customers using the charge points. By contrast, SP ENW’s costs will be borne by billpayers as a whole. However, it is difficult to say what the overall redistributive effect will be:

- In the short term, **higher-income households** may benefit more, since they are more likely to already own EVs and can immediately take advantage of new charging infrastructure. In this case, the impact would be considered regressive, as benefits accrue more to those with higher incomes.
- Conversely, **lower-income households** without access to private charging, or those living in areas with poor public transport links, could potentially benefit more over time, as the rollout of public chargers enables them to switch to EVs and access cheaper, cleaner travel.

This may therefore be an example where a qualitative exploration of these issues may suffice. Describing these differences clearly, even without numbers, helps ensure that the analysis still reflects fairness and inclusion.

## 11.2 Quantifying impacts by group

Where distributional effects are likely to be significant, the CBA can be extended to quantify impacts by group. This involves identifying which stakeholders experience costs or benefits,

and by how much. Although this disaggregation does not change the total Net Present Value (NPV) of the project, it helps to explain who gains and who pays, providing a clearer picture of how the intervention affects different groups.<sup>24</sup>

In this context, transfers can be included to show how value moves between groups, even though they should remain excluded from the total NPV as they do not represent real resource costs. As well as including transfers, some social costs and benefits may be excluded from the distributional analysis if they do not meaningfully differ across groups. For example, carbon emissions savings are shared by everyone in the world, so they would typically be omitted as the impact on individual consumers in a given area will be very small.

There is some judgement involved: if the analysis is comparing outcomes across geographical areas, local air-quality impacts might be relevant; but if the focus is on income or bill impacts across households, those same air-quality benefits may reasonably be excluded. The analysis can then consider how different groups are likely to experience the intervention. To assign shares of benefits and costs to each group use evidence or reasonable assumptions. For example, if higher-income households are more likely to own electric vehicles, they will receive a larger share of fuel-savings benefits in the short term.

## Using the Excel toolkit

The SROI tool could be used to explore how the total value is distributed between different groups of users. One way of doing this is as follows:

- **Define the groups that you are using.** This could be income quintiles, as described above. At the simplest, this could be two broad groups. E.g. low-income and high income.
- **Do not include the investment costs** because, for a network investment funded by billpayers, the cost would largely be spread across other customers who do not directly benefit from the investment. At the same time, the beneficiaries of the measure would only bear a very small share of costs, which is negligible for determining the ‘winners and losers’<sup>25</sup>.
- **Assign shares at the outcome level:** For each row in the SROI sheet (which will correspond to an input, outcome, or impact), decide what proportion you think belongs to each group.

<sup>24</sup> This approach aligns with Ofgem’s guidance on Assessing the Distributional Impact of Economic Regulation – see Ofgem 2020. [Assessing the Distributional Impact of Economic Regulation](#).

<sup>25</sup> As the goal of this approach is only determining who wins and who loses, it is appropriate to exclude the costs that do not affect the distributional impact. However, this is not the case when applying weights as costs need to be accounted for in the NPV.

- **Apply those shares when entering the amount of an outcome:** For each outcome, duplicate the outcome row in the tool so that you have one line for each group. Then multiply the total outcome amount by each group's share before entering it. For simplicity, we suggest keeping the share of attribution, deadweight, displacement and drop-off constant, unless there is clear evidence of a change by group. An exemption could be applying a higher deadweight rate to high income groups.
- **Mark which group each row applies to.** We suggest repurposing the column which indicates whether a row is a social or private benefit.
- **Add in any transfers.** They should be in twice – a negative for the group 'losing out' and a positive for the group 'winning'.
- **Validate that the overall result has not changed.** If you carry out the CBA as normal and include all groups summed together, the result should be identical to the aggregated version.
- **Carry out a separate CBA for each group.** We suggest replicating the 'SUMIF' formula at the top of the SROI sheet to extract each CBA line (e.g. investment cost, social costs, carbon emissions) for a specific group that you specify. These can then be directed into the CBA sheet.

### 11.3 Applying distributional weights

If the goal of the project is explicitly distributional, for example, if in our example the funding of V2G EV chargers were intended to improve access for lower-income households or disadvantaged communities, then it may be appropriate to apply distributional weights.

These weights adjust the monetary value of benefits to reflect that a pound received by someone on a low income contributes more to overall social welfare than the same pound received by someone on a higher income.

The UK Green Book provides a framework for this approach. It uses an elasticity of marginal utility of income (denoted as 'e'), normally set at 1.3, to capture how the value of additional income declines as income rises. This reflects the diminishing marginal utility of income (i.e. the principle that a £1 gain is worth more in welfare terms to a low-income household than to a high-income one). This can be done following the practical steps for calculating welfare weights in Annex A3 of the Green Book.

As a simplified example, if there were only two groups (low and high income), you would divide the median equivalised income of all households by the median equivalised income of each

group. Then, raise this number by the power of 1.3. This produces a weight which will be higher for groups with below-average incomes.

Note that the diminishing marginal utility of income principle only applies to income or financial impacts, and so the benefits and costs calculated by group would need to be limited to financial impacts, i.e. increase in bills, net savings from getting an EV, saving in charging your existing EV, etc.

As there is generally uncertainty about the weights, the model user should report both weighted and unweighted results, in line with Green Book best practice, to show how equity considerations affect overall value.

### Using the Excel toolkit

In the SROI tool, the user could apply weights to each group's adjusted financial value (resulting from quantifying impacts by group in subsection 11.2 above). This is, after the tool has produced each group's adjusted social value (after deadweight, attribution, etc.), multiply the totals of the financial impacts by its weight. Doing so will show how the overall social impact changes once the relative importance of benefits to each group is taken into account.

As explained above, the application of weights would be limited to the financial impacts.

## 12 Sensitivity analysis

When completing a CBA, you should always test how sensitive your results are to changes in key assumptions. This process, known as sensitivity analysis, helps you understand which variables have the greatest influence on the overall results and how robust your conclusions are to uncertainty.

Following HM Treasury's Green Book, sensitivity analysis should be used to identify the parameters that most affect the Net Present Value (NPV) of your intervention. By testing these assumptions, you can highlight where further evidence or analysis would most improve confidence in your results. The aim is not to predict precise outcomes, but to provide decision makers with a clear picture of the range of possible results and the level of uncertainty around them.

### 12.1 Carrying out sensitivity analysis

Start by identifying the assumptions that drive your results. These might include, for example, unit benefits or proxy values, uptake rates, discount rates, lifetime of assets, or optimism bias factors. For each key variable, change the input value within a plausible range and observe how the overall results change. As a rule of thumb, you should test at least a  $\pm 10\%$  or  $\pm 20\%$  variation in key assumptions or use ranges that reflect the evidence available (for example, low, central, and high estimates from literature or expert judgement).













The minimum plausible value of an input might be zero (for example, if you are unsure whether a benefit exists at all). If particular benefits are highly uncertain, it may be helpful to set them to zero, to confirm whether the CBA would give the same result without them (in which case they will not necessarily affect the decision being made, but can still be noted as a potential additional benefit),

The CVI guidelines include a table of suggested optimism bias assumptions for benefits, which is ultimately sourced from 2014 HMT guidance for local authorities.<sup>26</sup> As noted in section 7.2, it may not generally be appropriate to apply these as optimism bias simultaneously to all benefit inputs. However, they provide a useful 'rule of thumb' for sensitivity tests. We have reproduced these in Figure 3.

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<sup>26</sup> Reproduced from HMT, *Public Service Transformation Network, and New Economy (2014)*, [Supporting Public Service Transformation: Cost Benefit Analysis Guidance for Local Partnerships](#)

**Figure 3** Confidence grades for benefits data

Confidence grade	Colour coding	Population / Cohort Data	Evidence base (engagement / impact)	Age of data / analysis	Known data error		Optimism bias correction
1		Figures taken from agency data systems	Randomised Control Trial in UK	Current Data (<1 year old)	+/-2%		0%
2		Figures derived from local stats	International Randomised Control Trial	1-2 years old	+/-5%		-5%
3		Figures based on national analysis in similar areas	Independent monitoring of outcomes with a robust evaluation plan	2-3 years old	+/-10%		-10%
4		Figures based on generic national analysis	Practitioner monitoring of outcomes with a robust evaluation plan	3-4 years old	+/-15%		-15%
5		Figures based on international analysis	Secondary evidence from a similar type of intervention	4-5 years old	+/-20%		-25%
6		Uncorroborated expert judgement	Uncorroborated expert judgement	>5 years old	+/-25%		-40%

Source: Reproduced from HMT, Public Service Transformation Network, and New Economy (2014), [Supporting Public Service Transformation: Cost Benefit Analysis Guidance for Local Partnerships](#)Note

You can perform sensitivity analysis in several ways:

- One-way sensitivity analysis: Adjust one variable at a time to identify which assumptions have the largest impact on results.
- Scenario analysis: Combine multiple assumptions to create plausible 'best case' and 'worst case' scenarios.
- Switching values: Estimate how much a key variable would need to change to make the NPV fall to zero. This helps identify which assumptions are critical to maintaining value for money.

When reporting results, present your central case alongside the sensitivity results. You can summarise these in a table or simple graph showing how changes in key variables affect the NPV. The Green Book recommends showing both the absolute and percentage change in the outcome, and clearly stating which assumptions have the greatest influence.

In line with the Green Book's principle of proportionality, your sensitivity analysis should be appropriate to the scale and risk of the project. For smaller or lower-risk interventions, a simple set of 'high-low' tests may be sufficient. For larger or higher-risk investments, more detailed scenario testing may be warranted.

Finally, use sensitivity analysis to support transparent reporting. If results remain positive under a wide range of assumptions, this increases confidence in the case for the intervention.

If results are highly sensitive to certain parameters, you should highlight these uncertainties and, where possible, explain how they could be mitigated (for example, by gathering more robust evidence or refining assumptions).

## EV charger take-up programme case study

Look through all of the inputs (both proxies, and the values that the proxies are multiplied by) to identify what is most likely to be uncertain (the confidence grades in Figure 3 may help).

In this case, it is likely that many of the proxies are relatively well understood. For example, the cost of purchasing an EV today is known. The most uncertain inputs for this project are likely to be the project-specific assumptions that have been made (e.g. the number of cars that will use each charger).

Having determined that this is a key source of uncertainty, you could perform a 'what if' analysis to find the number of users that shifts the NPV between negative and positive and see how 'reasonable' that value is – is it plausible that the NPV of the project could be reversed? This will inevitably require a degree of subjectivity, although you might be able to ground a sense of what is 'reasonable' by looking at datasets such as the usage of other EV chargers.

If you find that this uncertainty has the potential to 'flip' the CBA and mean that the wrong decision is made, then you may wish to carry out additional analysis (for example, looking at the factors that affect EV charger usage in other communities and building a model to estimate likely usage in the communities under consideration). This will incur costs, but potentially avoid making an investment that turns out to not have a social return

Alternatively, the user can use the Excel functionality 'Watch window' to simply see how the NPV changes when changing the values of the amount of an outcome or the value of a proxy. This is described below.

## Using the Excel toolkit

Since many of the most uncertain inputs will likely come from the custom working that is added for a given CBA, the tool cannot provide a generic way of carrying out sensitivity tests. However, Excel comes with a variety of tools to automate this type of analysis – for example:

### **The watch window**

This allows the user to easily spot how the NPV changes as inputs are changed:

- On the 'Formulas' ribbon, click 'Watch Window'.
- Click 'Add Watch'.
- Navigate to the 'Option summary' sheet and click on the final NPV figure (in cell J33 for Option 1) and click 'Add'.
- The Watch window will show the NPV no matter where in the spreadsheet you are. The user can therefore make manual amendments to inputs and immediately understand the impact on NPV.

### **Scenario manager**

This allows the user to build a set of scenarios which simultaneously change a number of inputs (e.g. for an overall low/central/high scenario).

- On the 'Data' ribbon click 'What-If Analysis' then 'Scenario Manager'.
- Click 'New' and enter the name of the scenario (e.g. 'Low') and select the cells which will be changed (and must all be on the same sheet).
- Enter values for the inputs.
- You can then create additional scenarios and switch between them.

### **Goal seek**

This is helpful to quickly find the 'critical' value of an input which makes the NPV zero.

- On the 'Data' ribbon click 'What-If Analysis' then 'Goal seek'.
- The 'Set cell' needs to be set to the NPV (e.g. cell K33 of 'Option Summary')
- Set the 'To value' to zero
- Set the 'By changing cell' to the cell with the input you are testing.

## 13 Appendix A: Place-based analysis

Place-based analysis involves applying appraisal to a geographically defined area (e.g. a town or region), taking the specific context of that area into account. As noted by TAG,<sup>27</sup> it is carried out *in addition to* a standard CBA looking at the whole UK (which is still required to understand the overall impact of an intervention which affects multiple places).

The guidance for place-based analysis in the Green Book was developed in part to support the previous Government's 'levelling up' agenda. While the term 'levelling up' is now less commonly used, the current Government has placed a strong emphasis on resolving regional disparities. The 2025 review of the Green Book<sup>28</sup> has recommended an increase emphasis on developing place-based business cases, and so it is likely that further guidance on these techniques will follow.

RIIO-ED2 guidance does not require DNOs to carry out place-based analysis, and so it has been outside the scope of the tool developed alongside this guidance. However, place-based analysis could be relevant for some Social DSO activities. This section therefore provides an introduction, with references to more detailed guidelines.

### When might place-based analysis be appropriate?

Following best practice from HM Treasury's Green Book,<sup>29</sup> place-based analysis is required for two broad categories of proposal:

- *proposals with an objective that is specific to a particular place or area or type of area;*
- *proposals which do not have geographically defined objectives, but which appear likely to have different implications either positive or negative for parts of the UK that decision makers will need to understand and may need to take into account.*

The Green Book provides a further list of questions that the user can use when considering the need to carry on a place-based analysis. In general, the level of effort should be proportionate to the scale of expected place-based impacts (positive or negative).

### What does a place-based analysis involve?

A place-based analysis involves assessing the impact of an intervention on welfare. It is therefore much like a CBA: The costs and benefits need to be categorised and assessed, but

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<sup>27</sup> TAG unit A4.3 (2022), [Place-Based Analysis](#)

<sup>28</sup> HMT (2025), [Green Book Review 2025, Findings and actions](#)

<sup>29</sup> Specifically, Annex 2, *Place Based Analysis*

taking into account the specific circumstances of the area which is being assessed. However, there are two particularly important differences.

First, as the analysis is looking only at a single area, it is important to take leakage, displacement, and substitution into account:

- **Substitution** happens when firms or organisations replace one type of labour or activity with another to benefit from an intervention but without increasing overall output. For example, a company might shift workers from one role to another instead of taking on new staff, producing no net employment gain.
- **Leakage** occurs when some of the benefits of an intervention 'leak out' of the target area and accrue elsewhere. For example, if a project aims to increase employment in a particular area but many of the new jobs are taken up by residents of neighbouring areas, part of the effect should be treated as leakage away from the target area.
- **Displacement** arises when new economic activity in one location offsets or replaces similar activity elsewhere. For instance, if a new supported business in the target area gains market share from an existing business nearby, the apparent increase in employment may overstate the true net effect.
  - This is very similar to the concept of Displacement within a SROI analysis (see section 9.2). However, for a place-based analysis, we only need to account for displacement if the offsetting reduction happens *within* the area under consideration.

Second, unlike in a national CBA where new employment should not be included (see Section 8.3), new locally created jobs *should* be included in a place-based analysis. The Green Book contains 'multipliers' that help quantify the way that each directly created job may indirectly lead to the creation of additional jobs in the local area.

## 14 Appendix B: Description of proxy bank categories

This appendix replicates the description of each proxy category included in the SROI tool. The comments are intended as broad, category-level observations that highlight common considerations relevant to that type of impact, for example, typical assumptions, caveats, or factors users should bear in mind when selecting or applying a proxy from that category.

In addition, the proxy bank contained in the SROI tool includes more detailed notes at the individual proxy level for certain proxies that have been reviewed in greater depth.

**Table 4** Category level notes

Category name	Category description	Notes
Consumer - cost of time	Value of freeing up customer time - including the impact of increasing or reducing road congestion.	Some of these have been taken from the current version of TAG and are up-to-date. The values from the previous proxy bank (e.g. average hourly earnings) may not be aligned to latest guidance.
Consumer - health and wellbeing	Impacts to individuals of improved (or worsened) health and wellbeing outcomes. It also includes how a particular outcome (e.g. advice on mould) translates into a health impacts and hence into a value. It also includes impact from increased disposable income for consumers leading to better health outcomes. Costs of fatalities are also included here.	Where impacts result from reductions in outages (e.g. reduced stress due to fewer outages) there is a risk of double-counting. This is since the standard outage use in the ED2 CBA based on CML and CII are ultimately derived from a willingness-to-pay survey, which should (in theory) capture all outage impacts on customers. Some of these proxies have been taken from the 'Open Social Value Bank' which appears to be a Danish initiative and may not be UK-specific. We would recommend using UK governmental values where available. For example, TAG (the DfT guidance used for transport projects, and

Category name	Category description	Notes
		<p>referenced in the green book) contains values of fatalities. See <a href="https://www.gov.uk/government/publications/tag-data-book">https://www.gov.uk/government/publications/tag-data-book</a>.</p> <p>There is a mixture here of proxies representing the cost to individuals of their own ill-health, and the wider costs to society (e.g. reduced productivity). Care should be taken to ensure that both are taken into account but not double-counted.</p>
Consumer - other costs	<p>This category includes:</p> <ul style="list-style-type: none"> <li>- Costs to victims of crime, or disasters such as fires.</li> <li>- Impact of financial advice on consumers (allowing them to make better financial decisions).</li> <li>- Financial costs which relates to the (avoided) costs of activities that consumers might undertake - e.g. buying non-energy assets, undertaking training, or driving a vehicle.</li> </ul>	<p>Some of these proxies contain multiple types of cost. For example, a fire might impose direct costs of damage to property, plus costs relating to ill-health and fatalities. Please confirm the source for each proxy used to confirm that all types of cost are included, and there is no double-counting.</p> <p>Some of the financial cost proxies relate to training courses (e.g. IT literacy). If a project is providing these activities, then it will be important to also include corresponding benefits, rather than just these costs.</p>
Consumer tech - bills impacts	<p>These proxies all relate to the impact of customer-level actions (e.g. installing a certain technology, switching to a certain tariff, adopt some energy efficiency measure, avoiding the use of some technology) on customer utility bills (and potentially capital costs of measures themselves like heat pumps).</p>	<p>For a social CBA, it would be more common to break out the impact of the technology on underlying resource costs - for example, considering the electricity used by a heat pump, and valuing the cost of this using DESNZ's long-run marginal cost.</p> <p>That said, the bill impact could be used as a rough approximation to a resource cost, under the assumption that bills are broadly cost reflective. However if this is done then it is important to not include system impacts (such as cost of producing electricity, running the network, carbon</p>

Category name	Category description	Notes
		<p>emissions for electricity) as they will already be implicit in the bill, and this will lead to double counting.</p> <p>Most of these measures will have an implicit counterfactual which is not always clear (e.g. savings from installing a heat pump vs a gas boiler) - it's important that this lines up with the activity being assessed.</p> <p>Bill impacts are generally provided in yearly terms - this means that they will likely be incorrect over the long-term as bills change.</p> <p>Some proxy values include the cost of purchasing the technology (e.g. a boiler) itself, while others just consider the bill impact. It is important to include both, but not to double-count.</p> <p>The ENA proxy bank included older estimates for savings from EV and PV take-up, which we have removed as the ENW proxy bank includes newer figures.</p>
Consumer tech - capital costs (Capex)	Capital costs of technologies such as heating appliances or cars.	<p>Some proxies in this category include labour and fees.</p> <p>For some proxies in this category the counterfactual is not clear and the underlying costs would need to be checked.</p> <p>For some proxies in this category there is an equivalent proxy under the 'consumer tech - bill impact'. We suggest using capital/fuel/operating cost savings where possible rather than bill impacts, to better proxy resource costs.</p> <p>Some proxies in this category are labelled as 'Financial savings from a certain measure- cost of items'. Despite the description as 'savings', the</p>

Category name	Category description	Notes
		description of the proxy refer to what seems to be capital costs so are categorised here.
Consumer tech - carbon emissions	<p>These proxies all relate to the impact of technologies on carbon emissions: Carbon emissions, carbon benefits, avoided carbon emissions and carbon intensity associated with installing, using or switching to a certain low-carbon technology.</p> <p>These emissions themselves can be monetised through the standard ED2 CBA.</p>	<p>Carbon is priced into electricity (but not gas) retail prices via the UK ETS. If bill impacts are being used to approximate the resource costs of an activity that changes electricity usage, then carbon should not also be monetised, as this will lead to double-counting.</p> <p>Most of these measures will have an implicit counterfactual which is not always clear (e.g. savings from installing a heat pump vs a gas boiler) - it's important that this lines up with the activity being assessed.</p> <p>The carbon intensity of the electricity grid will change significantly over time. You should check the assumed carbon intensity used for individual proxies. If this is today's carbon intensity, then they may over-state carbon benefits of actions which reduce electricity usage, and under-state carbon benefits of actions which replace gas with electricity. DESNZ produces a forecast of grid carbon intensity.</p>
Consumer tech - fuel/energy savings	Energy savings from a certain technology.	<p>For some proxies in this category there is an equivalent proxy under the 'consumer tech - bill impact'. We suggest using capital/fuel/operating cost savings where possible rather than bill impacts, to better proxy resource costs.</p> <p>For some proxies in this category the counterfactual is not clear and the underlying costs would need to be checked.</p>

Category name	Category description	Notes
Consumer tech - operating costs (Opex)	Operational costs of technology.	For some proxies in this category there is an equivalent proxy under the 'consumer tech - bill impact'. We suggest using capital/fuel/operating cost savings where possible rather than bill impacts, to better proxy resource costs.
Economic and social value - Gross Value Added (GVA)	Outcomes which lead to an increase in productive capacity of the economy (gross value added is a measure that shows the amount of value that firms are adding to products, over and above the inputs that they use).	The Green Book is explicit that GVA effects should not be included in a CBA, and explains because it is a macroeconomic indicator, not a measure of real resource use. Despite this, it has become increasingly common to report the number of 'jobs and GVA supported' by programmes or interventions. This does not mean that these jobs and GVA are additional in a macroeconomic sense but rather provides a way of describing the labour market impact of a policy or investment.
Economic and social value - Other transfers	Standard values for transfers, such as debt relief, food vouchers etc.	Note that the ENA and ENW proxy banks include two different debt burden figures.
Economic and social value - Volunteering and charities value	This category contains proxies for the annual value created by volunteering and the ONS hourly value of volunteering.	No comments.
Economic and social value - Wage premia	Average annual impact on employee wages from earning qualifications (as well as	Wage premia can be used as a proxy for increased productivity, which is a societal benefit, under the assumption that labour markets are competitive. This would require calculating gross wage premia (i.e. adding

Category name	Category description	Notes
from qualifications	becoming employed, or other activities that increase wages).	<p>on employment taxes) rather than net wages, which is what is relevant for the impact on consumers.</p> <p>When using these proxies, please confirm in the underlying source whether the wage premium is net or gross. You will also need to confirm if the wage premia are calculated only over those individuals who are in employment. If so, you will need to multiply by probability of employment.</p>
Electricity system - cost of outages/interruptions	This category contains proxies for the Value of Lost Load (VoLL), Customer interruptions (CI) and Customer minutes lost (CML) - from Ofgem ED2 - CBA. Tab Fixed data, and SOP payments for incorrect voltage.	We recommend using these figures to cost outages unless there is a compelling reason to assume that a particular type of outage has a greater or lower cost to consumers.
Electricity system - network reinforcement carbon	Carbon emissions associated with network reinforcement	<p>Typically, activities will delay reinforcement rather than entirely avoid the need for it.</p> <p>Reinforcement costs have been taken from SP ENW's 2024/25 DSO Performance Panel CBA, and have not been separately verified.</p>
Electricity system - network reinforcement cost	Costs of network reinforcement.	<p>Typically, activities will delay reinforcement rather than entirely avoid the need for it.</p> <p>Reinforcement costs have been taken from SP ENW's 2024/25 DSO Performance Panel CBA, and have not been separately verified.</p>

Category name	Category description	Notes
Electricity system - wholesale costs	This category contains the gas Generation Marginal Cost from the ENWL CBA 2025-26.	This proxy can be used to calculate changes in the generation costs when increasing or reducing renewable generation. For example, to monetize the costs of wind curtailment.
Energy - carbon emissions	<p>These proxies all relate to the impact of energy (electricity and other fuels) on carbon emissions. For example, DESNZ's forecast of grid carbon intensity is contained here. These proxies can be used when assessing carbon savings from more renewable generation. These emissions themselves can be monetised through the standard ED2 CBA.</p>	<p>Carbon is priced into electricity (but not gas) retail prices via the UK ETS. If bill impacts are being used to approximate the resource costs of an activity that changes electricity usage, then carbon should not also be monetised, as this will lead to double-counting.</p> <p>The carbon intensity of the electricity grid will change significantly over time. You should check the assumed carbon price used for individual proxies.</p> <p>Check the sign: Positive when avoided but positive when additional emissions are accounted for.</p>
Energy - carbon values	<p>Carbon emissions, carbon benefits, avoided carbon emissions and carbon intensity associated with the use of electricity and fuels. It also includes emissions associated with energy efficiency.</p> <p>This category contains DEZN's carbon values for appraisal.</p>	These values might be used to update the standard ED2 CBA values (which are now several years old).
Energy - Long run variable costs (LRVC)	These are DESNZ's long-run marginal cost per unit of electricity and other fuels consumed.	This is used to value the resource costs of fuels including electricity. Care should be taken to avoid double counting when using Consumer tech-fuel/energy savings.

Category name	Category description	Notes
Other environmental impact - Carbon emissions from avoided or recycled materials	<p>These proxies all relate to avoided carbon emissions from using recycled materials or resources instead of new materials and also from not using certain materials our resources.</p> <p>These emissions themselves can be monetised through the standard ED2 CBA.</p>	Check the sign: Generally positive sign as it is avoided.
Other environmental impacts - Biodiversity	Valuation of externalities such as biodiversity, as well as ecosystem services like flood prevention.	No comments.
Other environmental impacts - Social costs of pollutants	Impacts on health, productivity, wellbeing and the environment from emissions (except Carbon)	<p>These figures already include health impacts, therefore care should be taken to avoid double-counting (e.g. if these figures are used, then reduced asthma cases could not be separately monetised). The values here are from ENW's proxy bank. These supersede the older values in the ENA proxy bank (and have been removed from this list).</p> <p>These figures are recommended by Defra when the impacts on air quality are relatively small. A more complex approach would be needed for bigger impacts. See <a href="https://www.gov.uk/government/publications/assess-the-impact-of-air-quality/air-quality-appraisal-damage-cost-guidance">https://www.gov.uk/government/publications/assess-the-impact-of-air-quality/air-quality-appraisal-damage-cost-guidance</a></p>
Public sector - Fiscal costs of qualifications	Net cost to the exchequer of additional qualifications (i.e. cost of providing qualification minus tax take)	The cost of providing a qualification does represent a resource cost, and would ideally be included in a societal CBA. However the resulting higher tax take is a transfer and so should not be included. Ideally these two impacts would be separated.

Category name	Category description	Notes
		Many of these proxies only appear to include the fiscal benefits of higher tax take, and not the cost of providing the qualification at all.
Public sector - Fiscal transfers	Transfers (generally benefits) made from the exchequer to certain groups of consumers. This also includes taxes based on economic activity (e.g. tax take from new industries).	From a social CBA perspective these are all transfers (e.g. if an individual stops receiving a benefit, the individual loses out, but the exchequer (and ultimately taxpayers) benefit).
Public sector - NHS financial costs	These relate to the cost to the NHS or the social care system of caring for a particular condition or translate a particular outcome (e.g. pollution) into health outcomes, and hence into costs to the NHS of caring for those conditions. It also contains the impacts to individuals of improved (or worsened) health and wellbeing outcomes. Costs of fatalities are also included here.	These costs do not include the costs to the individual and wider society of the condition itself. These will generally need to be added separately. Care should be taken to avoid double-counting within this category. For example, if a particular pollutant leads to asthma, then these impacts may already be quantified in a 'costs to the NHS of air pollution' proxy, so it would not be appropriate to additionally add in a 'costs of asthma' proxy. Many of these proxies appear to be somewhat outdated. An updated list can be found at <a href="https://www.england.nhs.uk/costing-in-the-nhs/national-cost-collection/">https://www.england.nhs.uk/costing-in-the-nhs/national-cost-collection/</a> .
Public sector- Financial costs	These relate to the cost to the public sector of providing services (e.g. social care). Note that in some cases (e.g. for care homes) these costs might also be borne by individuals.	These costs do not include the costs to the individual and wider society of the issues that the public sector is addressing (e.g. homelessness).
Unknown	For a small number of proxies, it has been difficult to understand what they are	

Category name	Category description	Notes
	measuring, and the source is not readily available.	

Source: *Frontier Economics*

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