

Carbon management: setting targets

Guidance for public sector organisations



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About this document

Resource Efficient Scotland has produced a suite of guidance resources, prepared and written by specialist carbon management consultants, to assist public sector organisations in developing, revising and maintaining their Carbon Management Plans, activities and supporting documentation.

This guidance is currently made up of a series of four inter-related documents, on the following themes:

- Organisational boundaries.
- Setting targets.
- Reporting.
- Governance and accountability.

These documents can each be read on their own, though there are connections between them – for example, the guidance on organisational boundaries has implications for target setting and for reporting (and vice versa). You will find references across the guidance to where more detailed information on particular points may be found in one of the other documents in the series.

Setting targets for Carbon Management

Setting explicit targets for reducing carbon emissions helps to:

- **Demonstrate leadership and commitment to your key stakeholders**
- **Focus and motivate across the organisation, among senior management and employees alike, to achieve real reductions in carbon emissions.**

1 Background context

For public sector organisations in Scotland targets for reducing carbon emissions will exist within the broader context of the Climate Change (Scotland) Act 2009 and the national targets which it enshrines in law: these are a 42% reduction in Scotland's emissions by 2020 and an 80% reduction by 2050 – all based on 1990 levels. Indeed, Part 4 of the Act places duties on public bodies relating to climate change¹. These duties require that a public body must (among other things) in exercising its functions act in the way best calculated to contribute to delivery of the Act's emissions reduction targets.

It is important to note, however, that organisations should not automatically consider committing now to an equivalent level of emissions cuts (e.g. 42% reduction by 2020). Remember, the national targets refer to a baseline of 1990 emissions and it is unlikely that you will know your organisation's 1990 baseline emissions. Furthermore, it is expected that

¹ These duties came into force on 1 January 2011 and apply to all 'public bodies', defined as a Scottish public authority within the meaning of section 3(1)(a) of the Freedom of Information (Scotland) Act 2002 (as amended). The Scottish Information Commissioner website contains information on Scottish public authorities.

emissions reductions will be achieved at different rates and to different extents across the range of sources of carbon emissions across Scotland.

Setting and reporting your own organisational reduction targets is a significant commitment to make, so it is important to consider the implications carefully. Too often targets are set by organisations rather arbitrarily, without proper consideration of practical application or achievability.

While it is important for targets to convey leadership and commitment, targets need to be more than high-minded ambitions. They must be '*SMART*' – *specific, measurable, achievable, realistic and time-based*.

SMART targets should be:

- **Calculated rationally** to reflect stretching yet realistic, achievable performance.
- **Discussed and agreed** with key stakeholders so that accountability is established.
- **Reviewed regularly** for progress toward the target – either quarterly or six-monthly and certainly annually as an absolute minimum.
- **Beneficial for day-to-day and strategic decision-making** in cost and environmental management.



If your targets do not meet the above criteria then they are likely to be perceived as arbitrary and risk being seen by stakeholders – including key employees who could otherwise be instrumental in delivering the implementation of your Carbon Management Plan (CMP) – as simply “targets for targets sake”. This is self-defeating for good carbon management. The targets associated with your CMP should give focus, scope and impetus to your organisation’s developing programme of carbon management. This should establish and maintain a clear aim for continuous improvement, rather than simply compliance with targets.

There are key decisions to be made in setting carbon reduction targets, each of which will be explored below:

- Target type:
 - absolute targets;
 - intensity targets; or
 - both?
- Target boundaries:
 - Which greenhouse gases (GHGs) to include?
 - Which Scopes: Scope 1, Scope 2 and/or Scope 3 emissions?
 - Which parts of the organisation should be included / excluded?
- Target time periods:
 - Over what time period should you measure achievement of targets?
- Level of targets:
 - How to assess the appropriate level for the targets in order to be ambitious and stretching without being unrealistic / unachievable.

2 Types of target

Two types of target are widely used:

- a) **Absolute targets:** these are usually expressed as a reduction over time in a specified quantity of emissions to the atmosphere, the unit typically being tonnes of CO₂ equivalents (CO₂e). Absolute targets are usually expressed as a percentage reduction from a baseline level of CO₂ emissions, to be achieved over a set period of time.
- b) **Intensity targets:** these are usually expressed as a reduction in the ratio of GHG emissions relative to another business metric for your organisation. The business metric could be a measure of the activity/output of the organisation (e.g. number of patients treated in a healthcare setting; number of students in an educational setting), or some other metric, e.g. office space. This would be stated in the form of tonnes CO₂e per X (where X is the measure of the organisations activity/output).

There are advantages and disadvantages of using the two different types of target. In particular, it should be borne in mind that relying on intensity targets alone can bring reputational risks. This is because meeting intensity targets may not result in a reduction in your absolute emissions, so you could be accused of failing to make a real contribution to tackling climate change. It is generally considered good practice for public sector organisations to set and publish *absolute* targets. Absolute targets are more directly consistent with the national targets and intentions set out in Scottish and UK climate change legislation.

3 Target boundaries

Some, particularly in the private sector, may set reduction targets only for specific parts of their organisation. While there may be reasons for taking this approach there are reputational risks involved in doing this, since in such a scenario your total organisational emissions may go up even if targeted emissions go down.

As a rule, the boundary that you set for your targets should be the same as the carbon footprint boundary set in your Carbon Management Plan, unless there is a very good exceptional reason why something *within* your footprint boundary should be excluded from your targets. (For general information on boundary setting for carbon management please refer to the guidance document in this series on *Organisational Boundaries*).

If you are considering setting targets for only certain parts of your organisation (and/or only for specific types of emissions), you must make sure that this is properly justified, made completely transparent and documented in your CMP and elsewhere as to what you are doing and why this needs to be the case for your organisation.

In setting target boundaries, you also need to consider:

Which greenhouse gases? Your target should always include CO₂ emissions, plus any of the five other GHGs covered by the Kyoto Protocol² for which your organisation has identifiable emissions. For many public sector organisations emissions of other GHGs may be likely to be minimal and difficult to identify/measure. For these reasons you may conclude it is appropriate to focus your targets and measurement on your CO₂ emissions

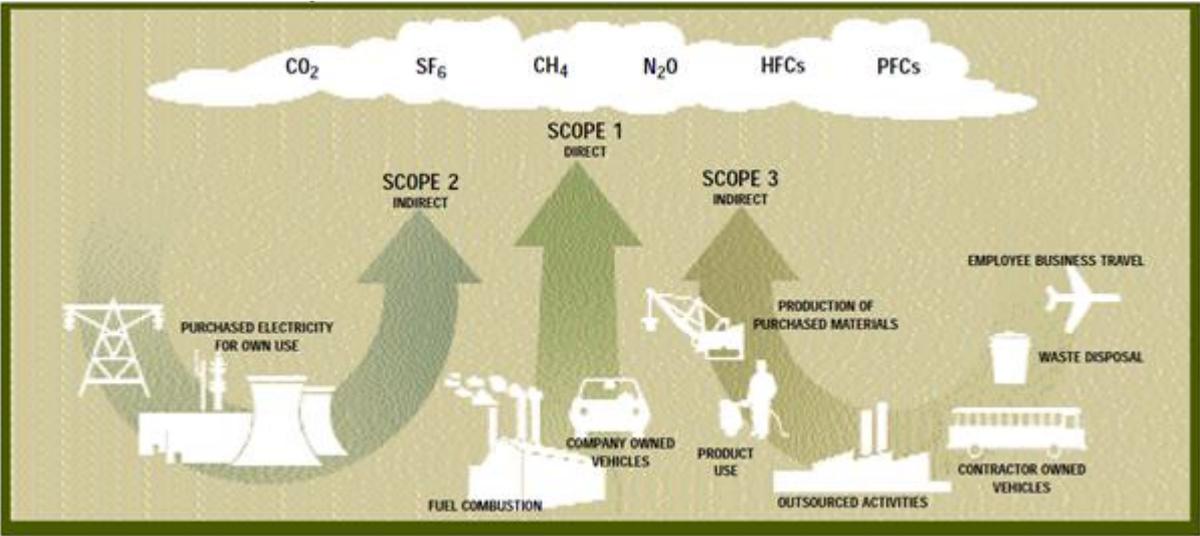
² The six GHGs covered by the Kyoto Protocol are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆). The 'currency' used in carbon management is tonnes of CO₂, meaning that the other five GHGs are stated in CO₂ equivalent terms – for example, one tonne of methane is equivalent to about 21 tonnes of CO₂. This is often written as CO₂e.

only. When using Defra conversion factors, though, you should always use the 'CO₂ equivalent' (CO₂e) factors as these will carry through the impact of non-CO₂ GHG emissions associated with the burning of fossil fuels and grid electricity. It should always be explicitly considered, documented and made transparent what GHGs are included in targets and emissions measurement and reporting.

Which geographical operations? If you have complex operations across multiple sites it may be acceptable to start off by setting targets for only those sites where you have reliable emissions data. Many public sector organisations in Scotland will have a large array of sites; for some (particularly very small) sites it may be challenging to obtain data for setting and tracking performance against targets, e.g. if the site(s) are not automatically metered for energy consumption. You will need to make an assessment of what is reasonable and robust, given the estate and the operations of your organisation and the data available to you.

Some larger organisations make informed assessments of where to set a reasonable cut-off point by estimating which buildings in their estate would need to be included in order to achieve a high percentage inclusion (typically at least 95%) of their organisation's total energy consumption and carbon emissions. This is a pragmatic way of dealing with the challenges of smaller sites, incomplete data and the disproportionate effort and diminishing returns of attempting to include such sites. It is also consistent with a rationale that focuses efforts on the organisation's larger sites where the bigger and more cost-effective savings are likely to be found and implemented. (An alternative to this approach would be to make informed estimations from the data which are available to you - and by reference to benchmarks where necessary). Where the decision is made to exclude certain sites from targets an explicit statement of this and the rationale applied should always be recorded in your CMP, with a commitment that, in the longer term, steps will be taken to cover all sites/operations in your targets and reporting.

Figure 1: GHG Protocol scopes 1, 2 & 3



Which Scope 1, 2 and/or 3 emissions?³ As a minimum, you should be setting targets based on your Scope 1 and Scope 2 emissions. Setting targets for Scope 3 emissions is

³ For more information on the definition of Scopes 1, 2 and 3 please refer to the guidance document in this series on *Reporting*. Note that latest UK Government Defra guidelines (2013) make a small adjustment to the illustration shown in **Error! Reference source not found.**, in now classifying emissions associated with losses in transmission and distribution of purchased electricity as scope 3 emissions. The vast majority of emissions associated with purchased electricity (the emissions at point of electricity generation) continue to be classified as scope 2.

more challenging; bear in mind that you may not have much influence over many of your indirect emissions (e.g. in your supply chain). So, it makes sense to consider this carefully and only set targets for those types of emissions where you do have significant influence and where you can reliably measure the emissions. There is no point in setting a target for, or basing targets more widely on, elements which you cannot robustly nor comparatively measure performance against as you move forward.

Excluding Scope 3 emissions? For some organisations, this may mean that in the short and even medium term they may have to exclude many Scope 3 elements from their baselines and targets (e.g. where they have no reliable measurement of, say, emissions associated with the waste materials generated from their organisation, or from water consumption, or commuter travel to/from work). This is not to say that these elements should be ignored, however. Again, an explicit statement should always be made as to what is included in baselines and targets and a clear commitment should also be made as to how and when this will be addressed, with a plan over time to develop metrics that are practical and robust for these Scope 3 elements. It makes sense to prioritise addressing the measurement and targeting of emissions sources which are likely to be (a) the largest in scale; and (b) where the largest reductions will be easiest to measure and influence. Overall targets should be adjusted to include such elements as and when the ability to measure them is in place.

Separate targets for different units of the organisation? In the public sector it is generally considered good practice to have one unifying target for the whole organisation, keeping things simple and clear for all stakeholders to observe and understand. If, however, your organisation has unusually diverse operations it may be appropriate to consider setting different targets for the different types of operations, especially if you are intending to use intensity targets.

4 Target time periods

The two choices you need to make are:

Short- or long-term target? It may be tempting to set a target completion date which is a long time into the future, with a view to aligning to the national carbon emissions reduction targets enshrined in the Climate Change (Scotland) Act 2009 (i.e. for 2020 and 2050). Another reason to set a long-term time horizon can be to allow time for significant capital investment in new, more carbon-efficient buildings or equipment. That said, we live in a changing world and the size and nature of your organisation and the operations it carries out may change substantially over a longer time period. What seems a reasonable long-term target now may become very difficult (or unduly easy) to meet in, say, ten years' time. A five year time frame is generally considered reasonable and practical for a public sector organisation.

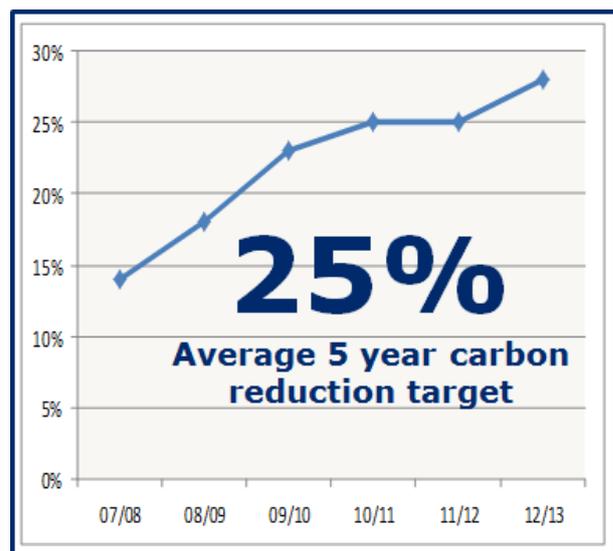


Figure 2: On average, UK public sector bodies in their CMP have set a 25% reduction target over 5 years (Source: Carbon Trust)

Single- or multiple-year commitment period?

Do you say:

"Our organisation will reduce emissions by 25% by the year 2018, compared to baseline year 2008."

Or, do you say:

"The average annual emissions of our organisation in the period 2013–2018 will be 25% less than in the base year 2008"?

The former is more intuitive and easier to articulate to all stakeholders, though the latter approach mitigates against unexpected events in any single year. For public sector organisations setting targets over a multi-year period (e.g. 5 years) it is generally considered better practice to keep the communication clear and simple and use the former approach, since in any case it allows for smoothing out of anomalies and an uneven trajectory, provided the achievement by the end of the period is sufficient in total to meet the target. Organisations should always be fully explicit about the time frame, for example if working to financial years, state your targets in terms of achieving the target by the end of the given financial year (e.g. *"by the end of March 2018"* in the example above).

5 The context for deciding target levels

Setting the level of your targets needs to take into account:

1. What you expect to happen to key organisational metrics over the target period, e.g. activity/output levels (as indicated by, for example, number of patients treated, number of students, and so on); number of employees; area of building space. Are significant changes expected/planned? How do these metrics impact on carbon emissions levels? Is there a direct relationship?
2. What are the biggest reduction opportunities you have identified and what will be their likely impact on your total emissions/carbon footprint as an organisation? What factors might prevent predicted reductions being achieved, and how likely are they to occur?
3. What is your baseline year against which targets are to be compared? Are the data, calculations and any assumptions upon which the baseline figures were founded still valid, robust and fit for comparisons with current (and future) year data? What adjustments may need to be made (e.g. due to changes to DEFRA/DECC conversion factors)? Refer to the guidance document in this series on *Reporting* for more information on changes to baselines.



Targets levels also need to take into consideration wider context and factors, which may include:

- The relationship between the targets for your organisation and the national targets in the Climate Change (Scotland) Act 2009 – how in the longer term will your organisation

deliver its share of the national reduction targets? Bear in mind, though, that the national targets are based on 1990 levels. Most organisations are unable to say with any degree of confidence what their carbon emissions levels were in 1990, so a direct mirroring of the national targets is unlikely to be practical or meaningful at organisational level.

- The 'RPP2' assessments of Scotland's progress towards its emissions reductions targets, 2013 to 2027 (see: [Low Carbon Scotland: Meeting our Emissions Reduction Targets 2013-2027 - The Second Report on Proposals and Policies⁴](#)).
- Carbon reduction targets or ambitions adopted by your sector (and others) – the current over-arching positions adopted by NHS Scotland, COSLA, Higher and Further Education sectoral bodies.
- Other related targets at organisational or sector level – which could be for energy, reduction in fossil fuel use, waste reduction, recycling rates and other measures of environmental performance and sustainability.
- The impact of the EU-Emissions Trading Scheme (EU-ETS), if you have large energy-intensive sites within your organisation which are included in this scheme.
- The impact of the UK Government's CRC Energy Efficiency Scheme on your organisation (if you are included in this scheme).
- Key external factors, such as the trend in decarbonisation of grid electricity that may be anticipated over the period for which your targets apply.



Again, it should be stressed that the carbon reduction targets set for your organisation need to be SMART targets *for your organisation*. So while you clearly need to be mindful of wider factors such as those listed above, the test of your targets remains: have they been calculated rationally to reflect stretching yet realistic, achievable performance for your organisation and its circumstances?

6 Calculating Targets

The following is a recognised approach for making calculations to inform rational carbon reduction targets for your organisation.

6.1 Establish the emissions of your baseline year

As indicated above, your targets will typically be expressed as a percentage reduction against the baseline year. Establishing the baseline against which performance can be measured is fundamental for carbon management. The baseline will be the CO₂e emissions of your organization for a full year (calendar or financial) – typically the last full year for which you have good information. The process of baselining is covered in more detail in the guidance document in this series on *Reporting*. (You may also find it useful to refer to the guidance document on *Organisational Boundaries* when considering and establishing your baseline). Before you look to set targets you should be satisfied that your baseline is as accurate and robust as is reasonably possible.

6.2 Develop the 'Business As Usual' (BAU) forecast

In order to set a realistic and achievable carbon reduction target it is important to know what the likely trend of the organisation's carbon footprint would be in the future if no

⁴ <http://www.scotland.gov.uk/Publications/2013/06/6387>

specific action were taken to reduce it. This is usually referred to as the 'business as usual' (BAU) forecast. In other words, BAU represents an estimate of what the overall carbon footprint of the organisation (based on the current footprint boundary) is likely to be in future years *in the absence of* the Carbon Management Plan. The BAU forecast helps you to predict how much in carbon emissions would need to be saved annually to meet a future target, which in turn allows you to identify a 'ballpark' range for targets that are likely to be realistic and achievable.

To establish the BAU scenario you need to take into account internal and external growth (and shrinkage) factors that are likely to affect the organisation's carbon footprint over time. Remember, although an overall carbon footprint is a single figure, in reality it is a complex underlying calculation, with different emissions sources affected by growth factors in different ways. Table 1 below shows a sample of some of the key factors that could affect BAU.

Table 2 gives an example of a BAU forecast, while

Figure 3 shows the BAU forecast in a graph. It can be very effective to show your BAU forecasts in graphical form in your CMP (this can be done for carbon emissions and also for related costs, e.g. utilities).

6.2.1 Why is it important to model BAU?

Previous carbon management programmes have forecast BAU quite simplistically by using a single annual percentage growth figure of 0.7% for the carbon footprint, based on a typical underlying growth in energy consumption of organisations over time (in line with general historical trends for recent years). As carbon management has become more sophisticated, organisations have become aware that this is not necessarily accurate. Furthermore, by failing to model BAU specific to their own organisation it is harder for carbon managers to make a clear demonstration of progress against targets and value for money for the carbon management programme, which in turn has a knock-on effect on internal investment.

If an organisation's BAU carbon footprint is actually increasing faster than anticipated, the efforts of the carbon management team would be underestimated. Conversely if the BAU is actually decreasing, the organisation might under-invest in carbon management, since the footprint has already been seen to be reducing – this could cause the organisation to miss out on possible cost and carbon savings that are achievable. A more accurate model of BAU can therefore help you to explain the true impacts of the CMP, set realistic targets and identify the most effective carbon reduction measures. More sophisticated models of BAU also provide a more in-depth look at which parts of the footprint are increasing and decreasing over time. This, along with financial models of the costs of fuels and services such as waste and water, can help organisations make better strategic decisions for future investment.

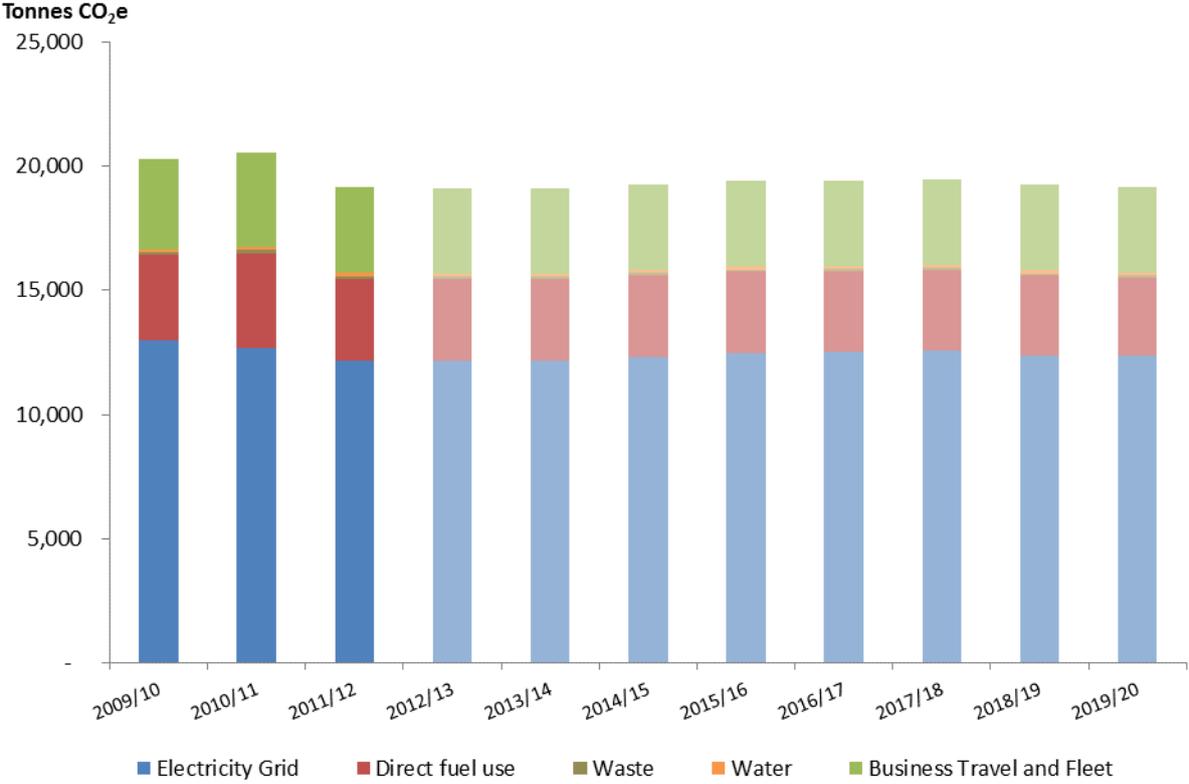
Table 1: Examples of key internal and external factors impacting on BAU

External factors		Internal factors	
<p>Electricity grid carbon factor - the factor applied to convert units of kWh of electricity consumed to a figure of CO₂e emitted.</p>	<p>The grid factor changes year on year due to a variety of external factors outside of the organisation's control, including relative prices of different fuels for power generation. Over a longer period of time, the grid factor will change due to energy policy and the relative contribution of different generating capacity, e.g. increased percentage of renewables supplying the grid. The aim of energy policy is to reduce the carbon intensity of the grid and this could therefore have a large effect on the overall footprint of an organisation</p>	<p>Energy intensity of your organisation's service provision</p>	<p>The energy used per staff member is likely to change over time, due to efficiency of equipment, nature of services delivered and energy intensity of IT use. This is one of the areas that is particularly difficult to model and it is likely that this will require further studies to improve modelling over time.</p>
		<p>Estate changes</p>	<p>Over time, organisations increase or decommission their estate in order to meet the requirements of the population served and the nature of the service provision. The more this can be modelled with real data, e.g. known floor areas or energy efficiency data, the more accurate this forecast can be.</p>

Table 2: Example of a BAU forecast for an organisation's carbon footprint

Emissions source	Estimated BAU emissions (tCO ₂ e)		Change between 2009/10 and 2019/20 (%)
	2009/10	2019/20	
Grid electricity	12,968	12,388	-4%
Direct fuel use (gas/gas oil)	3,474	3,125	-10%
Waste	114	92	-19%
Water	74	123	+66%
Business Travel & Fleet	3,653	3,446	-6%
Total	20,283	19,174	-5%

Figure 3: Example of a graph to represent an organisation's BAU forecast for its carbon footprint



6.2.2 Future modelling of BAU

BAU models are likely to change over time as your organisation understands and incorporates more internal factors in the BAU model, especially in terms of in-depth understanding of future estate and changes to staffing/service delivery models. There is also likely to be better information available about external factors, especially the carbon conversion factor of grid electricity, which could be a key contribution to future carbon reductions. It is therefore recommended that BAU forecasts are updated on a yearly basis to help understand where best to allocate resources and effort in future.

6.3 Establish/update your project register

Through discussions with relevant colleagues across the organisation, particularly those in your Estates/Facilities/Fleet/Asset Management (or equivalent) department(s), confirm and update the project list of viable carbon reduction opportunities which have been identified across your organisation (the key focus is likely to be on areas where larger volumes of scope 1 and 2 emissions arise).

You should aim to establish a list which is comprehensive for the first two or three years of the target period of your CMP, covering all known realistic solutions that can be implemented – including technical and non-technical (e.g. behavioural change) solutions. Each individual intervention needs to be quantified in terms of its annual carbon reduction potential impact. For the later years of the target period it is reasonable only to have an

outline of your potential projects and ideas. The quantification should be more comprehensive for projects that are closer to implementation. This will need to be accompanied by a structured process for the on-going identification and refinement of new projects – and, just as importantly, identification and securing of a funding stream for future projects.

Total up the cumulative impact, in absolute terms (tonnes of carbon), over the period of time for which your CMP will apply (typically 5 years); include the impact of any given measure only for the period of time for which it is likely to be in place during the lifetime of the CMP (e.g. if a boiler is likely to be replaced by the end of Year 3 of the Plan then the impact of the new, more efficient boiler can, of course, only be included for Years 4 and 5. The total calculated will start to give you an indication of the scale of a possible reduction target.

6.4 Quantify estimated costs and budgets for interventions

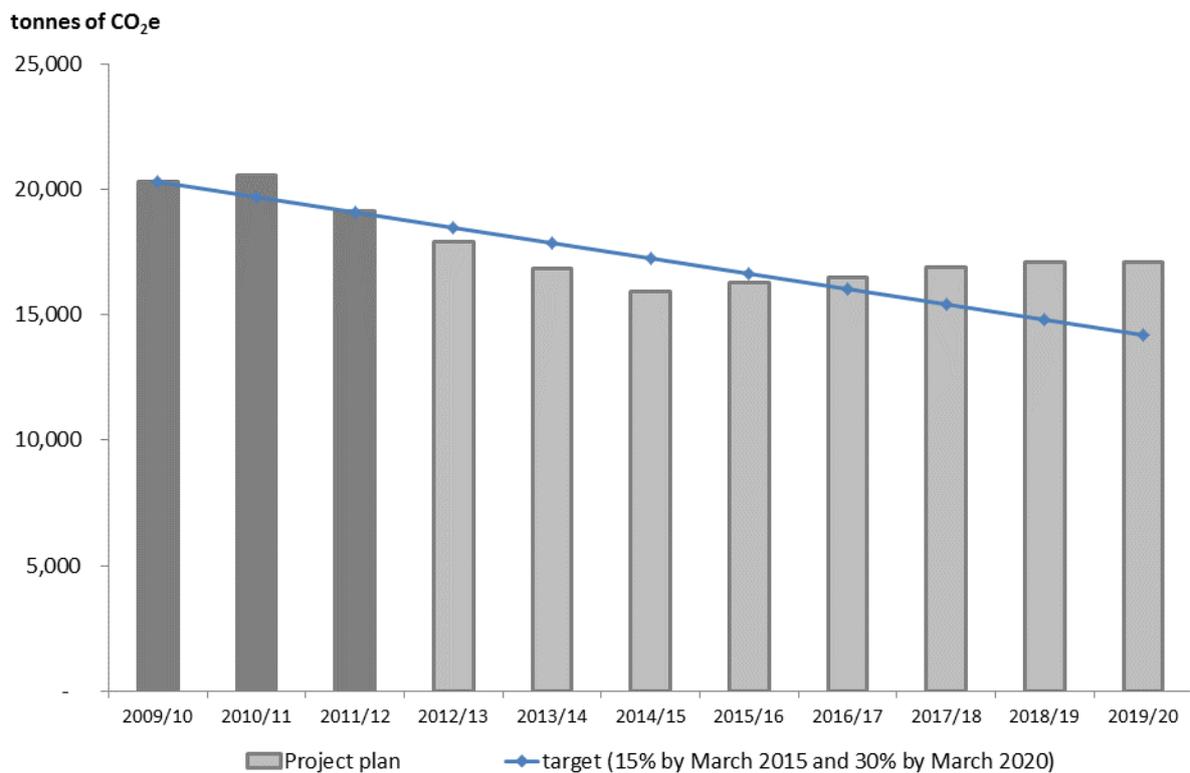
Each intervention now needs to be quantified in terms of its cost. Some interventions will appear to be no or low-cost in terms of the explicit financial investment involved, though there may be significant implicit costs, particularly in terms of staff time (e.g. for behavioural change initiatives), which may be increasingly at a premium in your organisation. Other interventions may require considerable explicit financial (capital) investment. It is important to be as comprehensive as possible when compiling costings, including both capital and resource/operational costs (for example by estimating for each intervention the amount of staff time which will be involved and costing this at a realistic standard rate for staff time).

Through discussions with key colleagues across the organisation you should be able to establish an indication of the financial budget which is likely to be available to fund projects and interventions listed in the CMP Project Register (bearing in mind that funding can come from various sources). Compare this budgetary information/estimation with your understanding of the costs involved to implement each project. This should enable you to draw together a reasonable picture of the projects and interventions which are likely to be possible with the funding and support which is likely to be available over the next few years.

From this, you can build up a picture of what carbon saving interventions might be possible to implement in your organisation in Year 1, Year 2, Year 3 and so on. In turn, from this you can sum up an indication of total yearly cumulative carbon savings that might be achieved from the projects which your organisation is likely to be able to fund. If you overlay this with your BAU forecast it will provide you with an understanding of the carbon saving trajectory which the organisation ought to be capable of achieving. Figure 4 shows an example of how this could be represented graphically in your CMP.

At this point you have a clear grounding for setting the level of SMART targets for the overall period of your CMP and for each intervening year. Considering this in the wider context, as outlined elsewhere in this document, it should be possible to conclude on realistic yet ambitious carbon reduction targets for your organisation, backed up with a robust rationale.

Figure 4: Example of graph forecasting an organisation's carbon footprint if planned projects are implemented (includes overlay trendline for possible reduction targets)



6.5 Record your calculations and assumptions

It is very important to keep clear and comprehensive records of the calculations you have carried out and any assumptions or adjustments which you have applied – including points brought in to consideration from the wider context. This documentary record could be very important:

- a) when presenting to colleagues and to senior management your proposals and the rationale for the targets which you are proposing, which you are seeking the organisation to commit to for a number of years;
- b) at a future date when reviewing the CMP, you or other employees may need to re-examine the targets and how they were arrived at in order to confirm if they are still appropriate, perhaps in light of changing circumstances for the organisation;
- c) as the CMP reaches toward the end of its timespan (typically after 5 years) it will need to be fully refreshed and new targets calculated, agreed and published. It will be important at this stage that there are good records which can be examined so that it is clear how the previous targets were established and whether new targets can be formulated on the same or an adjusted basis.