PRACTICAL **CLIMATE CHANGE TARGET SETTING** IN YOUR BUSINESS

WHAT IS IT AND HOW TO DO IT

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The need to galvanise global efforts to reach 'net zero carbon' is everywhere and is a valid call-to action; indeed, many businesses are now faced with supply chain imperatives to achieve this status by 2030 (or sooner) – far ahead of many countries' own 2050 net zero targets. What however has been less clear is exactly how to get to net zero carbon in a business, particularly whilst balancing other financial and operational needs.

We address the process and maths of how to set good targets based on the influence of 'passive' and 'active' reductions, explaining how to equate the influence of gradual decarbonisation of national grids, displacement of fossil-fuel vehicles and capex investment in lower-carbon site machinery.

By using this method, any business can simply set up and track targets that they can have confidence in delivering their net zero programme within resource & budgetary needs

INTRODUCTION

Climate change alleviation is an imperative - the question heavy on a business's mind is how to set a realistic target date to reach net zero. Whilst it is easy to 'pick a date out of thin air' of 2030, this frequently sets the business up for failure as the organisation has not charted the course to actually get there. Equally as bad, businesses frequently adopt a notional 10% reduction per annum target for each year; this often has little relation to operational reality and is again doomed to failure. Here we outline a straight-forward 'bottom-up' forecasting method, grounded by operational choices, that will set you up for success.

There are methods in the public domain, such as Science Based Targets, that allow you to work out what the top-level emissions reductions need to be for your business (to maintain 1.5°C) but that's just half of the equation. It does not tell you how to achieve the target and the practical things you will need to do and what (best) combination of these will meet your needs.

Climate change target setting – done methodically – needs to forecast emissions based on actual changes going on in the country and within the business year on year. Few businesses to date have adapted this approach. Once you have grasped a small set of principles, this is actually very straightforward (and is a good analogue to your long-term sales forecasting – with the exception that your carbon emissions must go down over time, not up!).

Keeping Below the 1.5°C Threshold- Why and How?

- **Keeping to no more than 1.5°C temperature rise** above pre-industrial levels has now entered public consciousness – few would accept more than that post COP 26.
- **1.5°C is generally accepted** (*IPCC, 2019*) **as the point beyond which climate change is irreversible**
- **The pathway to maintain 1.5°C requires emissions to reduce to 50% by 2030 and to 'net zero' by 2050 from 2010 levels** *(Roy. Soc., 2018)*.

METHODOLOGY

A business's Target Setting journey starts with a full carbon footprint assessment, following the Greenhouse Gas Protocol and ISO 14064-1 and should address Scopes 1, 2 and (at least) travel from your Scope 3 emissions.

If your business is assessing this for the first time (ahead of target setting for net zero) we highly recommend that you get some expert support as it is vital to know that you are setting the course from the valid baseline.

Passive & Active Carbon Reductions

- **Passive Reductions** –Carbon footprint reduction without any action by your business – e.g. due to decarbonisation of grid electricity.
- **Active Reduction**s – Carbon footprint reduction requiring direct action by your business – e.g. switching to electric vehicles early, installing more insulation etc.

Forecasting Future Carbon Emissions

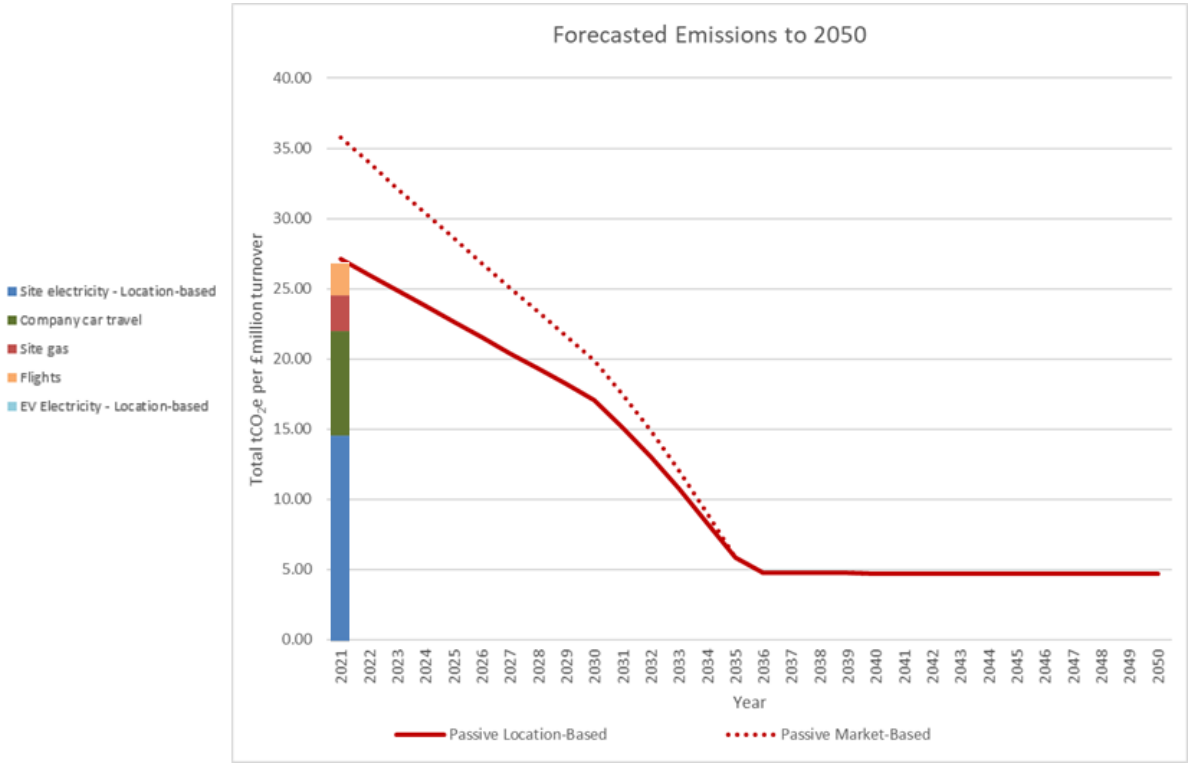

Figure 1 – An example of carbon reductions forecast from a 2021 to 2050 - accounting for passive reductions only.

Forecasting your business's carbon footprint may sound a dauting task for a business. However, for carbon there are now some clear commitments (set in law for many countries) that help greatly. For example, in the UK:

- **The UK government has set a target for Grid Electricity to be zero carbon by 2035**, so the grid carbon intensity (kg CO_2/kWh) will reduce steadily to zero over this period

- **Sales of new fossil-fuel cars (including hybrid and plug-in-hybrids) will be phased out by 2030** - meaning that for businesses with fleets / employee benefit (salary sacrifice) lease vehicles, most should be converted to full electric by around 2033.

This forms the 'passive' model. Put simply – you are doing little more than continuing to use grid electricity and relying on the diminishing national grid carbon intensity to achieve the reductions.

Figure 1 shows 2 scenarios:

- **Passive location-based emissions** – this shows predicted emissions reductions assuming the same emissions profile, with electricity calculated using grid-*average* electricity factors based on the location of sites.
- **Passive market-based emissions** – this shows predicted emissions reductions assuming the same emissions profile, with electricity calculated using emissions factors based on the specific tariff of the site. **In the example shown in figure 1, this is higher than the location-based emissions, as this company has not selected a green tariff. Figure 2 below shows a forecast based on the same company, but forecasting to switch to a green electricity tariff in 2026**.

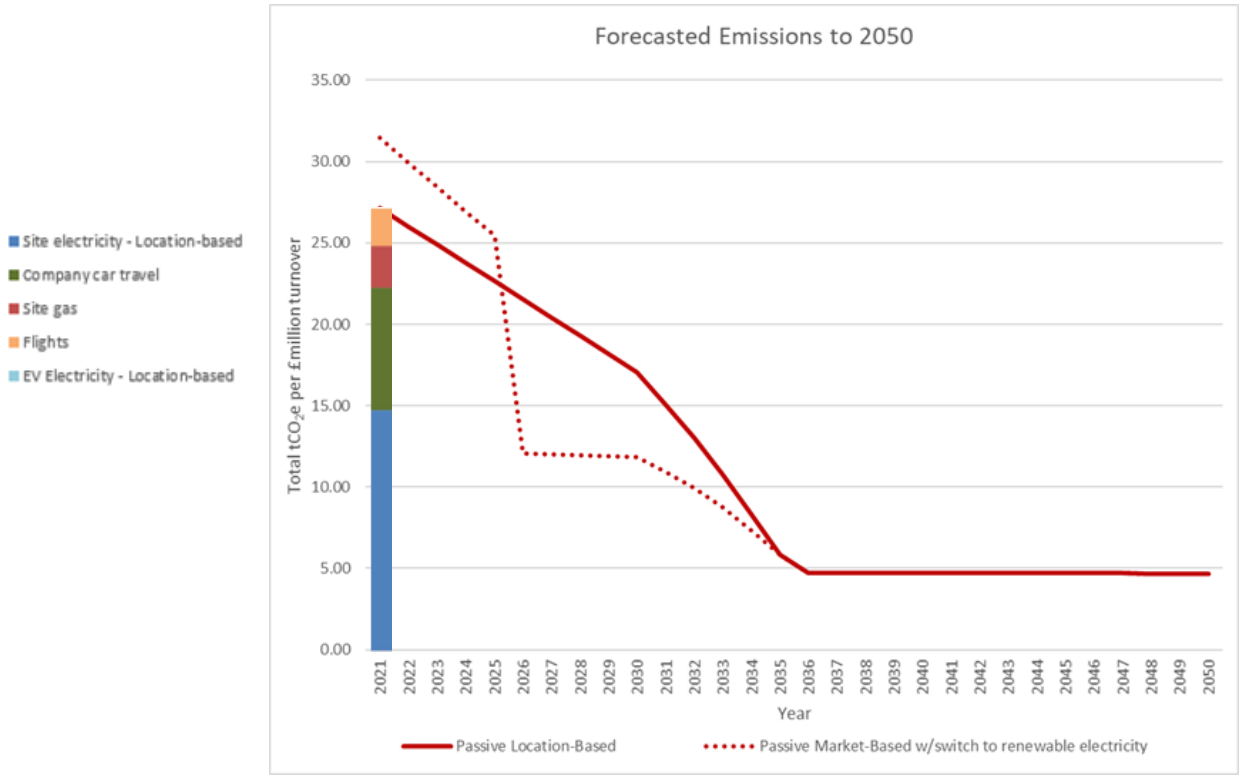

Figure 2 – An example of carbon reductions forecast - from a 2021 to 2050 - accounting for passive reductions, and assuming the company switches to a renewable energy electricity tariff at the beginning of 2026.

Note – it is possible for market-based emissions to be higher than location-based emissions if your business has only chosen renewable energy emissions for certain sites and others are reliant on non-renewable energy (that has a higher carbon intensity than the grid average location-based).

Both scenarios require no capital expenditure, change of production methodologies or behaviour change on-site.

How to Plot Carbon Reductions – The Maths

$$y(x) = \frac{0 - y_0}{x_{Neutral} - x_0}(x - x_{Neutral})$$

To calculate the carbon emissions factor, y, at year, x (above $y(x)$). Where $x_{Neutral}$ is the year that the factor reaches 0 and y_0 is the emissions factor in the year x_0, when the factor begins to decrease.

Alternatively, to calculate energy consumption, y, at year, x. Where $x_{Neutral}$ is the year that the energy reaches 0 and y_0 is the energy consumption in the year x_0, when the energy begins to decrease (if you are switching from using fuel to using electricity, the increase in electricity from the baseline at year x is the change in kWh calculated by $y_0 - y(x)$).

For example, to predict the passive reduced location-based electricity generation emissions factor in 2030 $(x = 2030)$ for a UK site with a 2021 baseline year ($x_0 = 2021$)

- **The BEIS emissions factor for the UK energy grid calculated in 2021 was $y_0 = 0.21233$ kgCO_2e/kWh**
- **The UK government's current target grid neutrality year is $x_{Neutral} = 2035$**

To calculate the forecast the emissions factor in 2030, we would substitute the following into the equation above, to acquire the result shown:

$$\boldsymbol{y(2030) = \frac{0 - 0.21233}{2035 - 2021}(2030 - 2035) = 0.07583\ \mathrm{kgCO_2e/kWh}}$$

This means that 0.07583 kgCO_2e/kWh would be the forecasted grid emissions factor for 2030 in the UK.

GETTING ACTIVE

For most businesses 'just following the passive curve' won't be enough, either because of specific supply chain requirements to deliver net zero by 2030 or sooner or due to their own proactive sustainability goals and need to maintain a good brand image.

Active reductions come from initiatives such as:

- Installing Solar Panels on company buildings
- Quicker adoption of fossil-fuel free vehicles – e.g. electric or hydrogen cars and trucks
- Capex investment in newer, more energy efficient plant machinery and energy saving measures in buildings
- Optimising processes & employee behaviours to use less energy in the business

Any good baseline carbon footprint assessment will have sufficient detail that you will be able to highlight the contribution of these emitters and - by knowing when you will implement the changes - you will be able to draw the curve on the graph to show the effect.

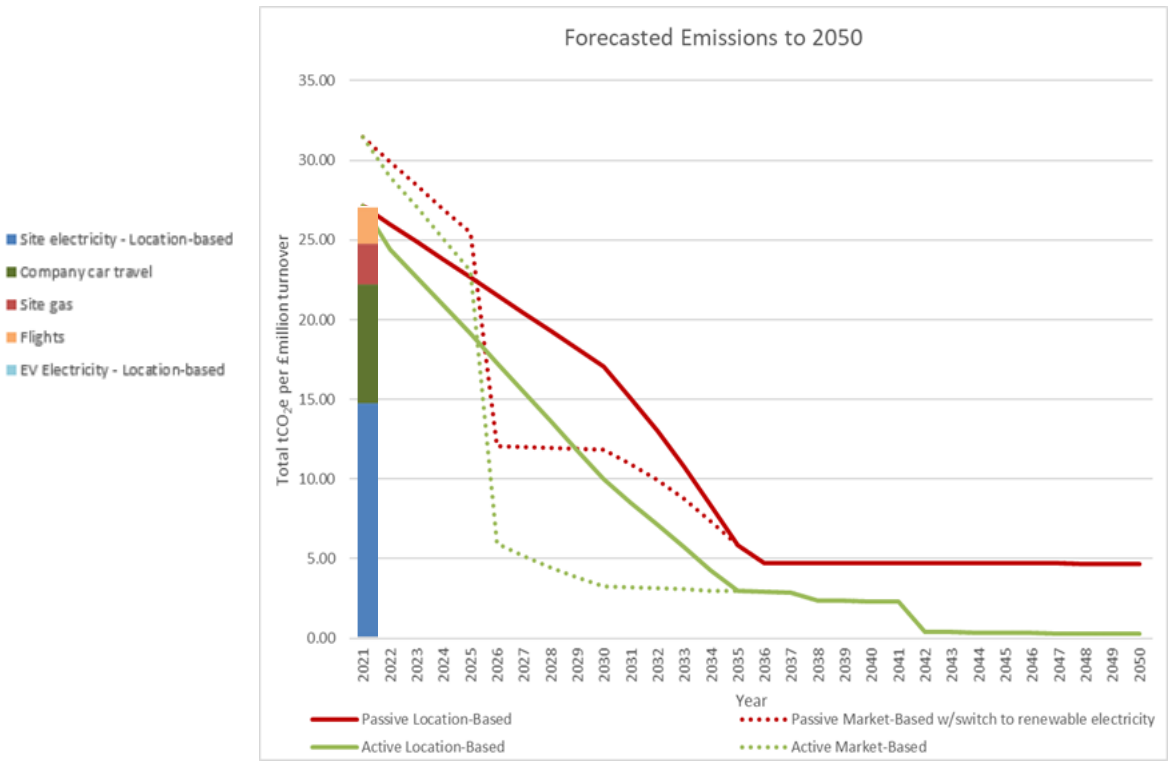

Figure 3 – Shows target setting updated from Figure 2 (passive & market emissions reductions) to include active reductions.

The additional influence of active reductions to reduce emissions further and quicker than passive reduction is shown in Figure 3. We see, in this example, how active reductions reduce emissions faster and achieve net zero carbon, which the passive models fail to do. Although both active reductions scenarios reach net zero at the same time (in this example).

CHOOSE WISELY – SELECTING THE CORRECT SCENARIO

Once you have finished the process of working out what the effect of Passive and Active reductions are you will have a chart comparing the 2 scenarios. This is the point that you must choose wisely.

The best way to select is in a meeting with your management team – they will be able to tell you whether you can go faster than the passive route or need to go a little slower than your active mode.

Agreed Carbon Reduction Targets:

1. Switch to 100% renewable electricity tariff by 2022
2. Cut our carbon emissions by 50% by 2030 (from 2021 baseline)
3. Cut our carbon emissions by >98% by 2050
4. Carbon offset to compensate for our emissions from 2022 to be carbon neutral whilst on this journey, and support carbon reduction projects around the globe

Figure 4 Example of targets a company can be published following this forecasting approach

Take their inputs to hone your model – not only is this useful and makes your model more accurate, you will build excellent top team buy-in to your programme.

Photo by fauxels from Pexels

TARGETS REVISTED

Once you have set your targets, share these with your employees – there's evidence (Edelman Intelligence, 2019) that staff retention is higher within businesses that have sustainability plans in action. As well, your staff are instrumental to the success of your net zero journey.

Share you plan publicly on your web-site – this might seem a bold step, but over the coming years we expect this to become common-place (or even to become a legal requirement in the same way that aspects such as anti-bribery and modern slavery have). We recommend that you disclose now, rather than waiting for legislation to mandate this.

At the 1-year mark, you will need to re-measure your carbon footprint and this will be the stage where you test the 'fit' of your achievements to the target setting plan. You may find that you have achieved more reductions than you hoped, or maybe less. At this point, you should review progress of your initiatives, rather than defaulting to reforecast targets. Communicate with your teams and celebrate/ share success stories, along the way.

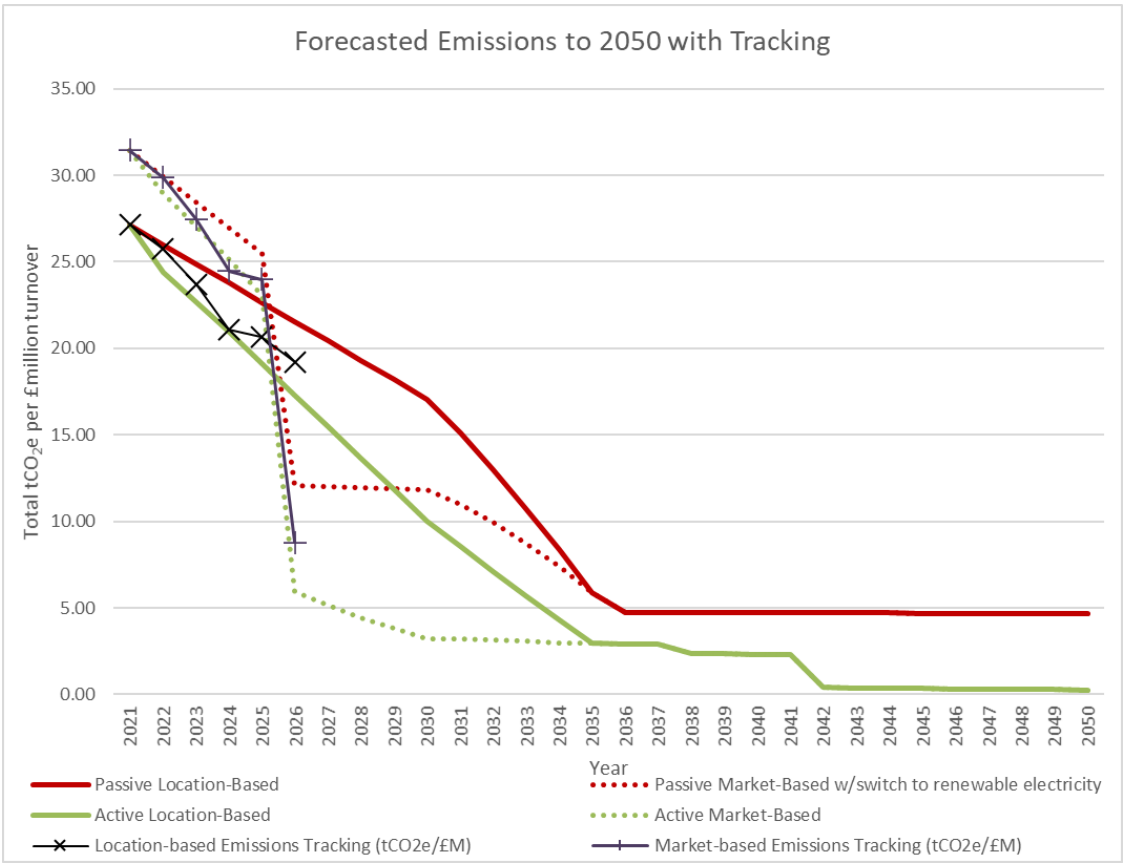

Figure 4 : An example of progress a business can track against their original forecast

Use this anniversary to boost your carbon reduction programme's momentum in the business. Also, this is the time to think about expanding its reach into supply chain emissions (though remember that you will need a robust measure of this carbon footprint before you address that).

On the way to Net Zero – You are not expected to reduce all your emissions to zero all at once, this is not possible. Carbon offsetting provides a method to account for the emissions that have

unfortunately not yet been reduced and should be done in combination with your net zero programme (not instead of it).

CONCLUSION

- **Climate Change Target Setting is an essential process to robustly deliver your net zero carbon plan**. The process involves some basic maths and scenario planning that is familiar to other business management activities (such as sales forecasting).
- **Set a target that is underpinned by a robust scenario** - taking into account all the actions you commit to do
- **It is essential that your management team agrees on the scenario to choose the right target** – their approval is vital to your success and forms a financial and resource commitment to the actions
- **Each year, you must chart progress to your targets – do not be tempted to change the target date too early** – but take action to make sure the underpinning action are achieved.
- **Share your targets and progress publicly** – this transparency will demonstrate both that you can set a robust commitment and prove that you can actually deliver it. This will have significant benefits to your company's reputation in your markets and of your brands.

REFERENCES

Edelman Intelligence. (2019). *HP Workforce Sustainability Survey: Global Insights Report.* https://press.hp.com/content/dam/hpi/press/press-kits/2019/earth-day-2019/HP%20Workforce%20Sustainability%20Survey.pdf

Intergovernmental Panel on Climate Change, IPCC. (2019). *Global warming of 1.5°C.* https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf

Royal Society (2018) Keeping global warming to 1.5°C: challenges and opportunities for the UK (royalsociety.org)

Carbon Footprint's team tree planting in a rewilding site in Hampshire.

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