Carbon Planning: A four-part guide to starting the carbon reduction journey [1]

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We are all aware that something needs to be done to reduce our carbon footprint, but many of us have no idea where to start.

Naturally the best place to start anything is from the beginning and in carbon planning the beginning is to measure where you are now - what your current carbon emissions are.

The principle is exactly the same as setting out to decorate a room; when you go out to buy paint you need to know how much to buy, and for that you need to measure your walls.

1. Measure

In carbon planning you need to set a baseline by measuring your current carbon footprint. To complete this you will need to decide what to include - and what to leave out; this is called setting your scope and boundary. It's like deciding which rooms to paint and how many of the walls you are painting. You want to include all relevant emissions sources, and what is relevant is decided by what you have control over and what you are able to make changes to.

So, make an inventory of the assets and activities of your business that are within your control and this is your list of carbon emission sources. If you have a large number of assets such as a fleet of pumping systems then you can record that list at a higher level such as at process level rather than individual component asset level. Next you'll need to be able to calculate the amount of carbon emissions from each of these sources and you'll be doing this for one years' worth of carbon emissions. Start by recording data that you already have against each of your assets and activities.

For example, you might know the total amount of electricity used per site or per submeter, by all of your electrical equipment in kilowatt hours from your electricity invoice or from your meter reading. Or you may be operating a 12 kilowatt pump at 80% power for 5 hours a day and so could calculate in kilowatt hours the electricity used by that pump. So, record either electricity in total kilowatt hours over a year, or record an inventory of assets and sum up the total power requirement in kilowatt hours for the year. For your baseline an annual figure of kilowatt hours of electricity is sufficient. Later more detail will allow you to create a carbon reduction plan itemised asset by asset, but at this stage we are looking to find your starting point.

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Likewise, you'll want to list items that use fuels directly on site such as heating boilers which use gas, or assets that burn oil, all solid fuels or other gaseous fuels. And, again, the writing of the item or the amount of that fuel purchased for one year will give you in kilowatt hours a value for those assets.

You can repeat this for vehicles recorded in litres of fuel used, or you could calculate the carbon footprint from the number of miles covered by the vehicles. And then you want to include items such as water used, which can be completed from invoices in cubic metres of water purchased and wastewater treated. Finally, you want to include materials used and also those disposed of. In an office you might be using office paper for printing or photocopying, you might be using cardboard or plastics, manufacturing using metals or glass, or constructing using aggregates - so a list of all of these items will form list of emission sources that you can calculate your carbon footprint from.

2. Calculate

Calculating your carbon emissions is not as tricky as it might sound. There are a number of online calculators, or you can consult the information provided by the government. This information is readily available from the UK government, the United States government and the Canadian government, to name a few, so consult the relevant government information on carbon emissions. This will tell you how to convert kilowatt hours of electricity, cubic metres of water and miles driven in a car, into carbon dioxide equivalents.

If you add these numbers to your list you now have a list of assets and activities that are emission sources, the amount of relevant emissions for carbon dioxide, such as kilowatt hours of electricity or litres of diesel, and the emission figures from the government information multiplying the emission figures per litre or kWh by the number of litres or kilowatt hours gives you carbon dioxide equivalents in tonnes or kilogrammes for each individual item. A sum of these is your carbon footprint.

3. Reduce

Set realistic changes for each one of the assets and activities that are potential emissions sources. For example, you might be able to change your electricity tariff to an eco-tariff, whereby the electricity you purchase is generated by a renewable source such as solar panels or wind turbines. You might even be able to set a plan longer term to fit solar panels of your own and so generate your own renewable electricity and also reduce your reliance on the National Grid. You could fit water saving devices, and so reduce the cubic metres of water, reducing at the same time the carbon dioxide equivalents associated with that water.

You might elect, longer term, to buy electric vehicles instead of fossil fuel vehicles and even install charging points on the company premises and, with additional use of batteries, this could even be charged from solar panels. The first thing to do at this stage is to reduce demand on energy so you want to look at your assets and consider their efficiency. Any asset giving out too much heat, noise or vibration is running inefficiently

and the energy is literally being wasted. So, a maintenance intervention would reduce that wasted energy and automatically make your assets both more efficient and cost effective but have the effect of reducing your carbon footprint too. Win win.

4. Report

Now is the time to share with all of your stakeholders; your customers, your suppliers, your employees, your senior management, if you haven't told them, and the community. Let everybody know that you are on a carbon reduction journey. Let them know that you have measured your carbon footprint. Let them know that you have set yourself carbon reduction targets. Go forth and put the plans into action.

Monitor your success; with each new initiative measure electricity used before and after servicing machinery and equipment that had previously been inefficient, measure gas use before and after implementing insulation, calculate carbon emissions from diesel vehicles and compare them to the new calculation with electric vehicles. Monitor monthly over the year and in a year's time remeasure your carbon footprint - and again tell the world how well you have done!

About the Author

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Dr Torill Bigg is Chief Carbon Reduction Engineer at Tunley Engineering in the United Kingdom. She is a Chartered Engineer with over 20 years' experience in industry specialising in innovative solutions to environmental protection. Torill holds a PhD from Cranfield University's School of Industrial and Manufacturing Science, is the author of 7 published peer reviewed papers and is a Member of the Institute of Chemical Engineers. Her work at Tunley Engineering over the last year has helped cut carbon emissions by 10,000,000 kg of CO2e; she works with companies to assess their Carbon Footprint and develop roadmaps to net zero.

For more information, visit www.tunley-engineering.com