Cyfoeth Naturiol Cymru
Natural Resources Wales

Worksheet

How much peat is required to offset your carbon footprint?

Peatlands store vast amounts of carbon and act as a natural carbon sink making them ideal for helping to tackle climate change. They globally store approximately double the amount of carbon stored in all the world's forests, making them a vital tool in helping to regulate the climate.

We can use peatlands to help visualise the impact of our carbon footprint. How many metres cubed of peat have stored the same amount of carbon that your actions have emitted in a year?

Step 1 – Calculate your annual carbon emissions

- To complete this activity you must first have calculated your total annual carbon footprint. Our Activity plan, resource cards and worksheet – How to calculate your carbon footprint are available to help.

Record your results below:

TOTAL carbon emissions for 1 day	**g**
Convert grams (g) to kilograms (kg) by dividing by 1000	kg
x 365 days for TOTAL carbon emissions or carbon footprint for 1 year	**kg**

IMPORTANT NOTE

If you are completing this activity **prior to or as part of your visit** to carry out a peatland condition assessment, you only need to complete Step 1. Please stop here and refer to our Worksheet - Assessing peatland condition, depth, age and carbon content.

If you complete this beforehand, make sure you take the figure you have calculated with you on your visit.

If you are completing this as **part of a classroom exercise** you can use the graph and calculations overleaf to **estimate** and **imagine** how much peat would be required to offset your annual carbon footprint. Proceed to Step 2.

Step 2 – Using the graph

- Once you know your carbon emissions for the year, use the 'carbon storing capacity of peat' graph provided to estimate the depth of peat it would take to store that amount of carbon.
- Find your annual carbon total on the vertical 'y' axis entitled 'Carbon stored (kg)' and mark a straight line across to the blue line on the graph. Then read down to the horizontal 'x' axis to find the depth of peat in metres required to offset your annual carbon footprint. This can then be visualised as a metre cubed column – see Figure 1.

Depth of 1m³ peat that equates to my annual carbon emission:	**m³**

Representation of a m³ column

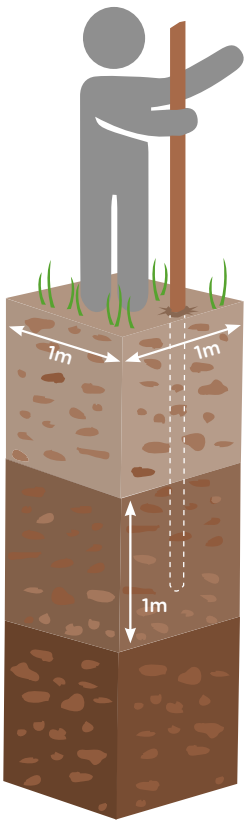
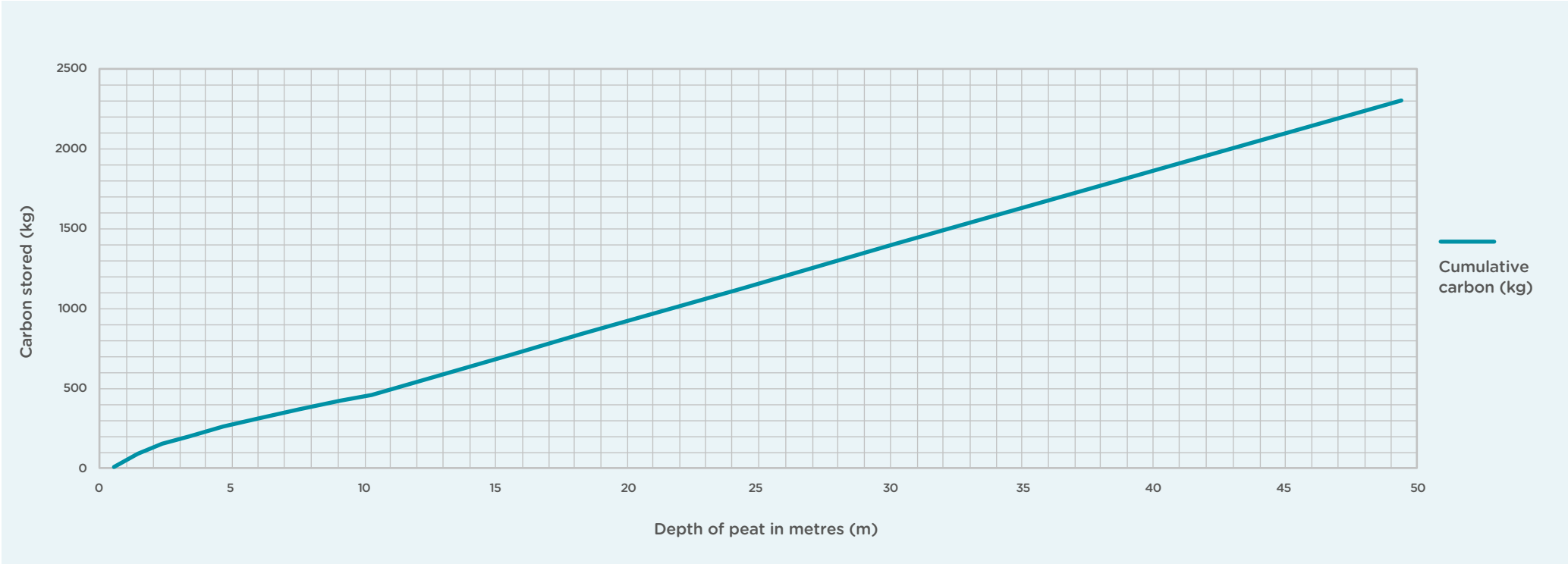


Figure 1

Carbon storing capacity of peat



Please Note: The amount of carbon stored in peat is related to peat composition, which has many variables such as its bulk density (the amount of peat dry matter per unit volume). To generate this graph, we have based the calculations on a scientific formula to 10m and then from 10m and deeper an average carbon storage figure has been used. Therefore, this graph isn't meant to be used as a scientific tool for mega depths of peat greater than 10m, but more as an educational tool to relate a carbon footprint to a volume of peat.

For more information see: Information note - Peatland: How carbon sinks can turn into carbon emitters.

Step 3 – Offsetting your carbon footprint

If, for example, your annual carbon footprint is 1432.4kg reading from the graph you would need a m^3 column of peat that is 31.1m deep to offset your carbon emissions! Taking thousands of years to develop, most peatlands are nowhere near that deep. If the peatland at our imaginary site is only 4.8m deep you would actually need a 6.48m^2 area of peat to offset your annual carbon footprint – see Figure 2, to compensate fully.

Imagine the surface area (m^2) and depth of peat will be needed to absorb your carbon emissions over your lifetime. Use the table below to calculate what that might be.

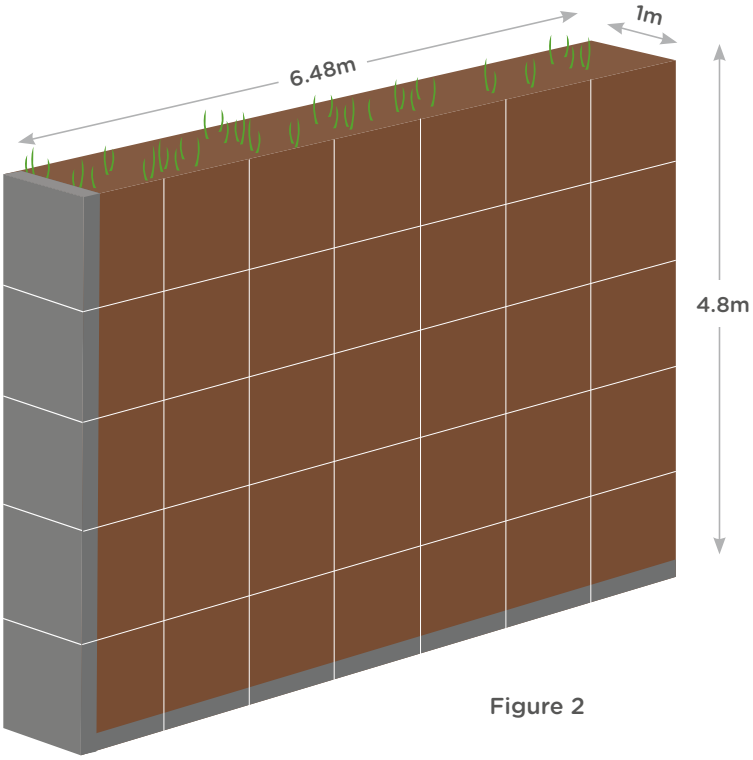


Figure 2

Description	Example	One year	Total for 10 years	Total for 30 years	Total for 50 years
My annual carbon footprint in kilograms of carbon per year (A)	**1432.4kg**				
Average depth of peat across our imaginary site (B)	**4.8m**	**4.8m**	**4.8m**	**4.8m**	**4.8m**
Carbon stored in kilograms across our imaginary site per m^3 (C)	**46kg/m^3**	**46kg/m^3**	**46kg/m^3**	**46kg/m^3**	**46kg/m^3**
Number of m^3 required = (A)/(C) = (D)	**1432.4kg/46kgm^3 = 31.1m^3**				
Surface area of peat required to offset my annual footprint = (D)/(B)	**31.1m^3/4.8m = 6.48m^2 therefore we require 7m^2 of 4.8m columns to compensate fully**				

Step 4 – Questions

On average peat has a growth rate of 1mm per year. Healthy peatlands absorb carbon at a higher rate than damaged peatlands. Damaged peatlands can emit CO_2.

- With this information in mind, answer the following questions. You should show your workings out for each question.

Question 1 **How long would it take peat to accumulate to a depth of one metre?**	
Question 2 **How long would it take for peat to accumulate to a depth that is equivalent to your height? To find out convert your height into millimetres.**	
Question 3 **How long would peat need to accumulate in order to offset your carbon footprint for a year?**	
Question 4 **If you live to be a grand old age of 90, how much surface area of peat at our imaginary site, will be needed to absorb your carbon emissions over your lifetime.**	
Question 5 **What can you do to reduce your carbon footprint? Make a commitment.** **I will reduce my carbon footprint by:**	

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