BUILDPASS

10 STEPS TO CUTTING YOUR BUILDING'S EMBODIED CARBON

A bigger, hotter topic...

There's no denying that sustainable construction is becoming a bigger, hotter topic on the public agenda. Finally, society is waking up to the fact that it's our job to do everything we can to create a greener, more responsible future.

One core way of doing this that is gaining momentum is by cutting the embodied carbon of a building.

Embodied carbon is the carbon footprint of any given material within a building. This footprint is measured by looking at the level of greenhouse gases that are released throughout the supply chain of the material. The result gives us a clearer idea of how that specific construction is contributing to overall emissions.

This measurement is tracked throughout the entire life-cycle of both the original material and the building it passes into. Its ramifications are irreversible; once that embodied energy has been released, the chances for improvement are minimal, if not non-existent.

Which is why we've created this guide:
10 steps to cut your building's embodied carbon.
These include:

1. Make sure the construction is built for the long-term.
2. Set the right foundations.
3. Consider all your structural options.
4. Opt for lower carbon materials.
5. Thin out your slabs.
6. Invest in durable materials.
7. Keep it small and simple.
8. Have movable or refurbishable walls in place.
9. Don't inundate the design with parking.
10. If it doesn't add value, get rid!

While this may feel like a truckload of steps, the benefits outweigh the work.

Why? Because there is the potential to reduce your embodied carbon by up to 20% without even increasing your costs; and these hacks are an impactful way to get there.

Ready? Then let's begin.

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STEP 1 Make sure the construction is built for the long-term

The first thing you ask yourself is: is there a permanent need for this building?

If the answer is NO, then you should seriously consider whether you want to commit to it at all.

To genuinely optimise the life-cycle impact of a building, you need to consider a long term lifespan. If the need for the building isn't sustainable - for example, if it is going to experience demographic or zoning change - then the embodied carbon impact could be up to 120% higher than that of a long lasting building.

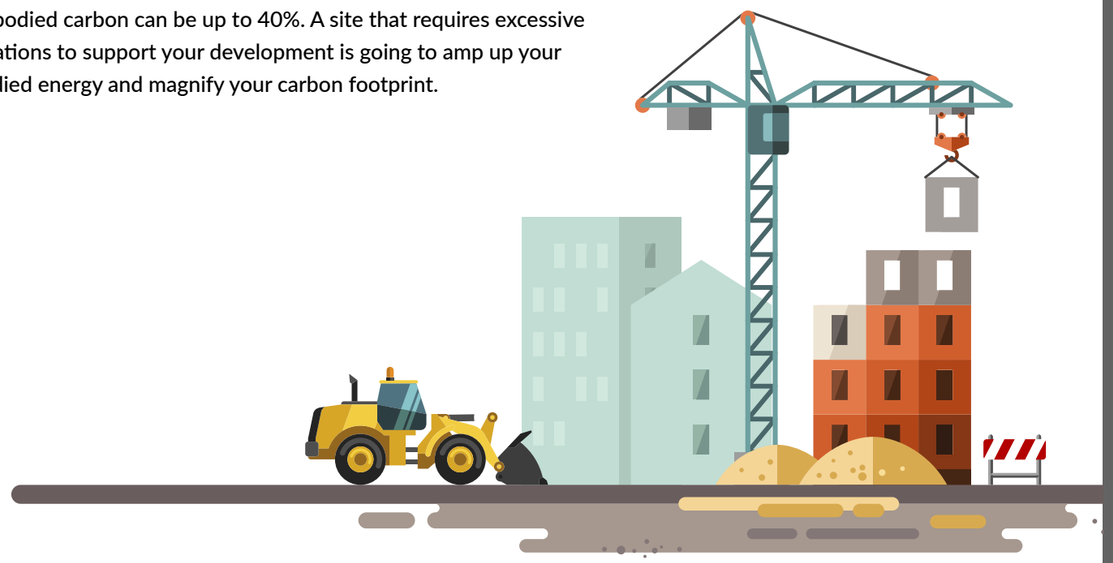
You can mitigate this by designing a building that is either fully adaptable or is a modular, transportable build.

But, ideally, your construction will be fulfilling a sustainable, permanent demand.

STEP 2 Set the right foundations

You should actively avoid any site that has deep foundations and / or requires soil stabilization.

The condition of the soil that you lay your building on has a major impact on your level of embodied carbon; in fact, the foundation contribution to embodied carbon can be up to 40%. A site that requires excessive foundations to support your development is going to amp up your embodied energy and magnify your carbon footprint.



STEP 3 Consider all your structural options

You should always strive to use lighter - ideally timber - frames whenever possible.

Of course, this won't always work for your project. But, by choosing a wood structure, you can reduce your embodied carbon contribution considerably.

This is the most sustainable choice as timber requires minimal processing in comparison to other mainstream building materials, such as steel, concrete and aluminium. The processing of timber also emits far less sulphur dioxide, carbon monoxide, hydrocarbons and VOCs than other materials.

STEP 4 Opt for lower carbon solutions

There are other ways you can make use of lower carbon materials in your development.

Consider all the materials your design requires: can you choose suppliers who are willing to provide products with an improved environmental performance?

This could include high recycled products - such as recycled binders for concrete - as well as limiting your use of high carbon items like aluminium, plastics and foam insulation.

STEP 5 Thin out your slabs

Slabs are a huge offender when it comes to construction embodied carbon.

Thicker slabs lead to a taller building envelope which culminate in a need for more materials and a higher energy conductive loss.

The answer? Thinner slabs.

By reducing the size of your slabs, you can reduce the life cycle of embodied impacts by over 5%. The reason being is that the amount of slabs required lines up with the internal area needed for a building. These slabs embed piping and other installations. They also lay the groundwork for walls and set their overall height; if you can reduce this, even by 10cm, you can seriously lower your end impact.

STEP 6 Invest in durable materials

Let's face it; quick fixes are NEVER a good idea when it comes to construction and design.

Choose durable, long-lived solutions for your build; particularly with regards to your windows and roofing. This will equate to fewer replacements throughout its life and, as a huge bonus, less carbon emissions, less waste, less costs and less tenant disruption.

In this case, less really is more.

STEP 7 Keep it small and simple.

You may have a Grand Designs puzzle-piece of a building in mind, but remember that a simple shape is far more material and energy efficient.

Complex designs mean bigger demands on external walls and also require further access corridors. Plus, the larger the building, the larger the envelope area; this comes with more energy loss, another red mark on your green checklist.

Optimise your design with a compact shape. See? Simple.

STEP 8 Have movable or refurbishable walls in place

You can solve space distribution problems by having movable or refurbishable elements within your walls.

Really, it's just good practice. Floor Plan configurations will often change over time, and by integrating reusable internal walls you can create a system that better works for the building function. This eliminates the need to totally rebuild a development as changes occur.

However, if this practice doesn't quite work for your design, you can also apply construction methods that make it possible to remove the boards intact.

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STEP 9 Don't inundate the design with parking

Avoid, avoid, AVOID separate parking structures.

Often parking structures use a huge amount of materials through needless walls around spaces. If your zoning law allows it, you should always aim to limit the number of parking spots you supply; this is especially important when it comes to underground parking and spots in parking towers.

If you need to put parking spaces beneath the building, explore raising the structure so that it stands on pillars and has an open space for parking.

In a perfect scenario, you would only use above ground parking; by doing this, your embodied carbon implications could be almost 70% lower.

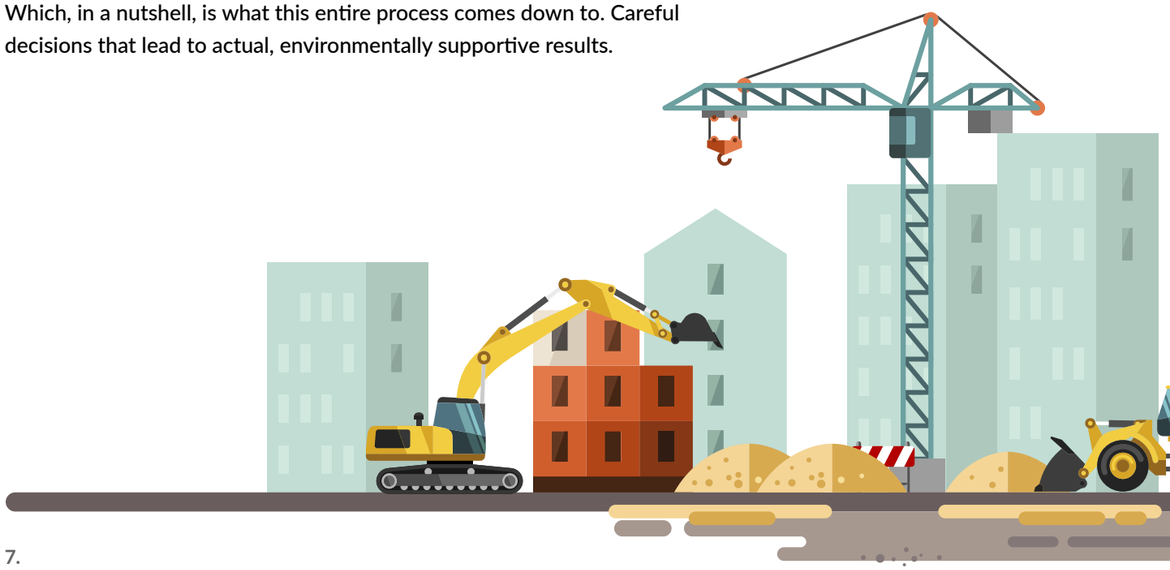
STEP 10 If it doesn't add value, get rid!

Ready for the final point? If the material only exists to "look good", bin it.

You want to avoid any elements that have a low value. If it has only been added to the design to fulfil an aesthetic function, it's actually just going to negate your building efficiency. If you can, omit that layer entirely.

This could be applicable to ceilings that don't deliver an acoustic or fire protection value. This would also relate to flooring and facades. Explore the options that actually serve a real purpose.

Which, in a nutshell, is what this entire process comes down to. Careful decisions that lead to actual, environmentally supportive results.



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