UK GBC

The voice of our sustainable built environment

REDUCING EMBODIED ECOLOGICAL IMPACTS

PRACTICAL GUIDE

This Practical Guide covers key principles of reducing negative embodied ecological impacts in the built environment.

IN A SNAPSHOT

When we think about the impact of building projects on nature, we often think about the harm caused on site; within the 'red line boundary'. For example, habitats being cleared to make space for a building. However, there are many impacts that affect places further afield, way beyond the site. These might be caused by resource extraction, manufacturing, production or at another point in the supply chain. The term 'embodied ecological impacts' is used to describe those impacts. An example is deforestation caused by bauxite mines in Australia, Guinea, China and Brazil to make building products such as windows and door frames.

Why is it important?

We are in the middle of a global biodiversity emergency, with a 69% decline in global biodiversity populations since 1970. Biodiversity and the need for green and healthy urban environments is increasingly being considered within the built environment. However, worldwide only 1% of our planet's surface area is used for buildings and infrastructure, so focusing on the site level alone will not be enough to tackle our global nature and biodiversity emergency.

The impacts of the construction industry reach well beyond the footprints of our towns, cities and country boarders. In a world of globalised trade and supply chains, many negative impacts are transferred to sites and areas remote from the building site. These include: deforestation, water scarcity, pollution, and even violent conflicts which impact our natural environment. These can be hard to identify in a fragmented, global industry that often lacks transparency.

We need to consider the full picture of the way we impact nature via the ways we do business. This includes embodied ecological impacts caused by material extraction and within our suply chains.

The Mitigation Hierarchy

The following principles are known as the 'mitigation hierarchy' and are an approach that can be used to reduce the environmental footprint of resourcing for the built environment. They also work well when applied in the context of reducing embodied ecological impacts. The steps are listed in order of priority.

1 | Prioritise best use of existing assets

Reusing, refurbishing and maintaining existing buildings to eliminate the need for new construction materials in the first place is always the best option.

2 | Prioritise reused materials and match availability

Where maintaining or reusing an existing building is not an option, reusing materials and products is the next best option.

3 | Prioritise recycled and biobased materials and match availability

If the above measures cannot take place, then using recycled and biobased materials is an option. However, the availability of recycled and biobased materials is limited. Recycling is dependent on the availability of reusable materials and products, and biobased materials are dependent on the regeneration rates of biogenic materials. Therefore, over-demanding these materials is not a sustainable solution, and reducing the demand form amterials should be prioritised first.

4 | Optimise design

If a building cannot be re-used and a new building must be built, then lowering the amount of construction materials needed by design is important. For example, through optimised structural design and simplified forms, and planning for future flexibility of use, recovery, and reuse.

5 | Regenerative or low-impact material extraction

Limiting the extraction of materials to sites and processes that actively seek to minimise disturbance of existing ecosystems such as through maintaining habitats and ecological corridors, organising extraction windows and rates so as to enable ecosystems to recover, and restoring habitats and ecosystems where damage does occur is important.

6 | Avoid material

If all of the above mitigation measures are impossible, exploring alternative materials and applying the hierarchy again can take place.

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How can it be done?

Reducing embodied ecological impacts will vary depending on different processes, supply chains, industries and contexts. However, below are some considerations for both projects or organisations.

On projects

1 | Apply the resource use mitigation hierarchy

By following the mitigation hierarchy projects can reduce embodied ecological impacts caused by resource and materials extraction.

2 | Embrace the circular economy

A circular economy is an economy that is based on keeping materials in use for as long as possible. This is done by maximising reuse, designing for disassembly and supporting the systemic shifts needed for this transition.

3 | Engage with your supply chain

Embodied ecological impacts often lie upstream and out of an organisation's direct control. Engaging with the supply chain is therefore crucial to gather information and data, and demand and enhance transparency.

In organisations

1 | Embrace existing and emerging frameworks

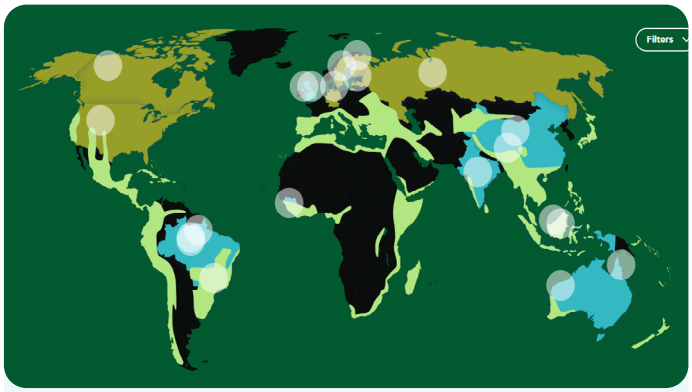
Get familiar with the Task Force on Nature-Related Financial Disclosures (TNFD) recommendations and Science Based Targets Network (SBTN) assessment. These are both frameworks for identifying, disclosing, and responding to organisational nature-related issues. More detailed information can be found in SBTN's Technical Guidance on target setting.

2 | Perform a materiality screening and value chain assessment

A materiality screening will define the social and environmental topics that matter most to your business and your stakeholders and have the highest ecological impacts. A value chain assessment will evaluate each of the activities in your companies' value chain to see where the biggest embodied ecological impacts lie. Together, these assessments will determinate which impacts are most pressing for your organisation to address.

3 | Set an organisational nature and biodiversity strategy

Commitment from leadership is necessary to provide a structured path for the company to follow as it works toward its sustainability goals. The strategy should clearly outline specific targets and roadmaps, serving as a guiding framework for achieving measurable and impactful outcomes, providing accountability.



Additional Information

UKGBC have created a resource hub to increase knowledge around embodied ecological impacts within the built environment industry. This inlcudes an interactive Materials Map, which shows the main locations for material extraction, overlayed with biodiversity hotspots. By clicking on the interactive elements of this map users can find out more information about the sources of different commonly used materials in the UK built environment, such as aggregates, aluminium and cement, UKGBC have allocated an Impact Rating for each of these materials in terms of their impact on biodiversity, climate, land, fresh water and ocean. These categories align with the SBTN guidance mentioned in the box to the left.

IN SUMMARY

The ecological emergency will only be tackled if we look beyond a projects red line, and examine the impact of our supply chains. Taking action on projects and within our organisations can start the shift from having predominantly negative ecological impacts towards cultivating positive impacts and relationships with nature and ecosystems.

FURTHER RESOURCES

- UKGBC: Embodied Ecological Impacts
- Task Force on Nature-related Financial Disclosures
- Science Based Targets Network
- UKGBC: System Enablers for a Circular Economy