COTSWOLD
District Council

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Embodied Carbon and the Circular Economy

Embodied Carbon

Embodied carbon is the total amount of greenhouse gasses generated through the life of the building – this includes those produced in building it. This will vary between buildings, however, those built before the industrial revolution are likely to have lower embodied carbon than anything built after this point, especially buildings built after the Second World War. This is because materials were not transported very far and because of how the building materials were made.

When a traditional building is demolished, or historic building components disposed of, this embodied carbon is lost and released back into the atmosphere. This will contribute to the changing climate. Therefore, it is important to maintain and repair all buildings to minimise our consumption of materials and the contribution which the building fabric is making to the release of carbon emissions into the atmosphere.

If a new element needs to be introduced into a building (for example a window or door or an extension), or indeed an entire new building is proposed, if renewable materials and materials which are recycled are used, this will keep the embodied carbon of the building to a minimum. Examples of these materials include wood, lime based products, straw, natural stone or clay, to name a few. Many of these materials where traditionally used in building construction and therefore are often compatible with traditional building fabric.

Circular Economy

Circular economy principles are focused on the use of recyclable materials, repair, minimisation of waste and designing for longevity. To address the climate emergency, many people and organisations consider that it is necessary to move towards this model. This is

because it reduces our consumption of resources and consequently our environmental impact.

When designing a building a building or extension with circular economy principles in mind, the building should

- Be easy to maintain and repair
- Have flexibility for future adaptation
- A long lifespan
- Use materials that can be recycled at the end of the building or structures useable life

Further information

Historic England has produced a guide explaining the principles of embodied carbon in an article called **Heritage, Buildings and Embodied Carbon**.

Historic England have written an article call **Heritage in the Circular Economy** which helpfully explains the principles of a circular economy and their relationship with the historic built environment.

Historic England has also produced a useful introductory guide on **Carbon in the Built Environment**.

Leti (London Energy Transformation Initiative) has produced a useful poster on the **circular economy**, which help to explain the basic principles. Leti also have a raft of more detailed guidance on retrofit, embodied carbon and design principles. A link to their website can be found **here**.