

# What does zero carbon mean?

## 1. The definition of zero carbon.

The dictionary definition of zero carbon is “causing or resulting in no release of carbon dioxide into the atmosphere”. While this definition is easy to grasp, determining what is zero carbon in practice can be complex and rests on how carbon emissions are measured and quantified. The term ‘carbon neutral’ is also widely used to describe a process where there are actual carbon emissions from a process, but these are only returning to the atmosphere carbon that was only recently removed (e.g. biomass combustion). Similarly, ‘net zero’ is an often used term to describe a process which might be carbon positive at some periods of the year and negative at others, and over the whole year, the positive equals or outweighs the negative.

### 1.1 What is the reality of the zero carbon claim?

The scope and boundaries of a GHG assessment are critical in determining the reality of a zero carbon claim. For example, an electric vehicle may be zero carbon in use, but the ‘embodied carbon’ associated with the car’s manufacture and the electricity used to charge it, may result in significant GHG emissions. Different interest groups can potentially come up with very different answers to the same question.

The term ‘carbon emission’ is also used as shorthand for the emission of all greenhouse gases (GHGs) in general. Carbon dioxide from burning fossil fuels is the most important (accounting for some 70%) source of GHG emissions globally, but other gases are important too, such as methane from the natural gas supply chain and from ruminant livestock and Nitrous Oxide from agricultural fertilisers. For simplicity, GHG emissions are usually converted into their carbon dioxide

equivalent ('CO<sub>2</sub>eq') using published conversion factors derived by sophisticated climate models.

In what is recognised as an extremely complex planetary process, 'Earth System Science' is also driven by land use changes (such as deforestation) and albedo changes (as Arctic sea ice and tundra recede), as well as other feedback loops (release of methane from deposits previously locked by permafrost), not just the gaseous composition of the atmosphere.

## 2. The GHG Protocol

A global methodology has been developed over the last 20 years to standardise GHG emission calculations: the Greenhouse Gas Protocol maintained by the World Resources Institute and the World Business Council for Sustainable Development (<https://ghgprotocol.org>). This categorises GHG emissions into three 'scopes'.

- Scope 1 emissions are direct emissions arising from site activities (fossil fuel combustion, refrigerant release).
- Scope 2 emissions are indirect emissions from site activities using energy where the emissions arise off site e.g. the use of electricity from the grid.
- Scope 3 emissions are all indirect emissions not included in scope 2, that occur in the value chain both upstream and downstream of the reporting entity.

The Protocol underpins numerous reporting initiatives in which Verco is active, including The Task force on Climate-related Financial Disclosures (TCFD), the Carbon Disclosure Project (CDP) and GRESB, a benchmark for Real Estate Asset owners.

### **3. Calculating net carbon emissions**

A robust GHG assessment carefully considers the boundary of the reporting. This is often done in terms of control, be it operational, financial or based on equity share. This determines how much of the supply chain emissions should be included in a GHG inventory. The appropriate emission factors are then applied as per the GHG Protocol to calculate the carbon associated with each item in the GHG inventory.

### **4. Conclusion**

In summary, the GHG Protocol sets the overall framework for carbon accounting, but work continues to apply the Protocol to different situations and make the definition of zero carbon more precise and robust. For example, Verco is a member of an industry working group coordinated by the UK Green Building Council (UKGBC) which is developing a definition for net zero carbon buildings in the UK. This will prioritise action in the following order: energy reduction and efficiency, energy management, on-site renewables, off-site renewables and perhaps offsets for scope 3 emissions. It is proposed that all elements be underwritten by disclosure and third-party verification.