De-Carbonising Construction for Surveyors

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SUMMARY

Construction projects give rise to global climate change impacts through the emission of greenhouse gases (GHGs) which include carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O). Climate change impacts are considered in terms of Global Warming Potential (GWP) which is the heat absorbed by the emission of different greenhouse gases. GWP can be expressed on a comparable basis i.e. in units of carbon dioxide equivalent (CO2e) per 1 tonne of the gas over 100 years. This carbon dioxide equivalent metric is commonly referred to as "carbon emissions" and all relevant greenhouse gases are typically included in the carbon assessments using conversion factors.

ICMS, Third Edition, to be published later in 2021, is intended to provide a reporting framework for carbon emissions to be used in conjunction with existing standards, guidance and tools, and emerging developments that are coming on stream to support de-carbonisation.

Whole life carbon emissions from construction should be reported in kilograms carbon dioxide equivalent (kgCO2e), or any clearly stated metric multiples thereof as appropriate such as tonnes of carbon dioxide equivalent (tCO2e).

A whole life approach to carbon assessment and management is advocated as it helps to identify the optimum approach for reducing lifetime emissions and also avoids any unintended consequences of focusing on emissions from one part of the life cycle alone. A whole life approach also enables circular economy principles to be addressed, for example by encouraging future re-purposing of a building or infrastructure asset and its components, which can further reduce the carbon emissions and improve the sustainability of the asset.

Carbon assessments for major construction projects can be complex and data-intensive and it is

acknowledged that there may be challenges and constraints in providing a whole life assessment pending the further development of practical tools and specific data sources. Transparency is therefore of utmost importance so that when presenting carbon emissions, the scope of emissions that have been included or excluded should be made clear.

Whole life carbon assessment standards (i.e. EN 15978:2011) identify a series of whole life carbon stages (A1-C4 plus D) that integrate with the ICMS phases. There are various nominal life cycles associated with these stages (e.g. a full "cradle to grave" approach or a more limited "cradle to practical completion" approach) reflecting the limitations in the scope of carbon assessment undertaken at a particular point in the development of a particular project. Whatever scope has been undertaken in the underlying carbon assessment, it should be clearly reported alongside the carbon emissions results and other associated attributes. As with costs, ICMS distinguishes between Whole Life Carbon Emissions and Life Cycle Carbon Emissions. Thus Life Cycle Carbon Emissions may be part of a wider project evaluation that considers Whole Life Carbon Emissions including carbon savings arising from energy generation or recycling as well as those associated with benefits and loads beyond the project's system boundary (whole life carbon stage D). These results should be reported separately for clarity and comparability.

In terms of the timing and frequency of assessing carbon emissions, whole life carbon assessments should be undertaken in a sequential fashion during the design, procurement, construction and post-completion stages, starting as early as at concept design stage" and "As a minimum, a whole life carbon assessment must be carried out before the commencement of the technical design of the project. The assessment of carbon will therefore initially be based on forecasts of carbon emissions, progressively updated with data based on actual quantities and activities.