

# PRACTICALLY GREEN LTD BRIEFING PAPER – MEASURING CARBON IN CONSTRUCTION AND INFRASTRUCTURE DEVELOPMENT

**Construction & Carbon** A recent trade press article had the following stand out headline that got my attention.

**“Three-quarters of UK construction firms operate a low-carbon strategy”**

Recent research identified 75% of construction companies surveyed were now operating a low-carbon or carbon reduction strategy. In addition, 74% of respondents favoured suppliers that offer low-carbon products or demonstrate green credentials.

**Our experience** This was extremely pertinent to Practically Green as we have been involved with carbon footprint work for over a decade. The business has just been commissioned to undertake pioneering work measuring the carbon footprint of Inverness and the wider Scottish Highlands. We also help clients involved with construction, civils infrastructure and trades, to measure and manage their carbon emissions as well as providing analysis and reports for tenders and trade accreditations.

**Carbon Costs** Reducing carbon though is not just an environmental priority, **high carbon equals high costs.** A carbon footprint is very simply a resource footprint. Pretty much everything we do in our day to day private and working lives requires resources and carbon rich fossil fuels. This has been the norm since the industrial revolution. However, this reliance on fossil fuels is being diluted with our increasing generation of low carbon renewable energy.

**Operational vs Embodied Carbon** Most construction businesses will be concerned about 2 forms of carbon emissions;

- **Operational carbon** is a consequence of fleet and plant fuel, onsite generator fuel and electricity use. Water use and waste disposal and treatment also generates carbon emissions. These can be proactively managed through KPIs and a Carbon Management Plan.
- As the energy performance of buildings has improved and organisations have reduced operational carbon, interest is now switching to **embodied carbon**. Many construction materials for example steel, bricks, and cement, require significant amounts of energy in their production. This creates a high level of embodied carbon. The challenge for the construction and infrastructure sectors is to find ways of measuring and reducing this embodied carbon.

A number of large public sector organisations including the Water Industry Regulator, Network Rail, Highways Agency and the Environmental Agency now seek information on project embodied carbon.

**Reducing Embodied Emissions** An effective approach to addressing embodied carbon is identifying the largest sources and setting reduction targets, for example

- Selecting materials with lower carbon intensities can reduce emissions by up to 20%
- Changing the building design to require less materials through for example lower weight roof design can reduce emissions by up to 20%

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- Undertaking off-site construction can reduce waste and emissions by up to 10%
- Design for less waste on site can reduce emissions by up to 10%
- Sourcing locally produced construction material for example aggregates and timber can reduce transport emissions by up to 2.5%

### **Longer term considerations**

Interest is also growing in the longer term carbon implications of construction materials and infrastructure projects. Aluminium and stainless steel may have a high embodied carbon per kilogram. But their corrosion resistance means that carbon-intensive anti corrosion paint coatings may not need to be applied to the material surfaces. In addition, metals have a long lifetime, and can easily be recovered for recycling again reducing carbon emissions.

The Environment Agency recently cited an example of the creation of an earth bank rather than a more carbon intensive concrete wall. To give an accurate carbon comparison would involve estimating the carbon arising from mowing the grass and any maintenance of the bank.

The balance between embodied and operational carbon also differs from sector to sector. Embodied carbon is more pronounced in buildings housing low-energy intensity activities such as warehouses. In office buildings, embodied carbon accounts for over half the whole life carbon cost, in supermarkets it is 50 per cent and in a semi-detached house it is higher than 50 per cent.

### **Funding to help businesses**

A range of public funding is available to help construction businesses engage with this low carbon agenda.

- The Scottish Government has allocated £76m specifically for a Low Carbon Infrastructure Transition Programme providing tailored support for established and start-up infrastructure projects across the private, public and community sectors.
- Free SME reviews are available to help identify where businesses can reduce resource use and operational carbon, with access to 0% finance to make improvements
- Subsidised training is available to help senior and operational staff in SMEs to understand and engage with low carbon operations

### **Conclusion**

Construction is recognised as making a significant contribution to a low carbon and more resource efficient future. As the research mentioned at the start of this briefing indicated, construction sector businesses are increasingly aware this is an agenda they need to engage with.

Enthusiastic and proactive engagement will help businesses to establish more embedded carbon measurement and management. Evidence of this engagement is already being recognised in a number of procurement portals, and trade accreditations.