

Decarbonising Construction

Most industries are trying hard to tackle the issues around climate change, and Gammon is no different. Its carbon reduction initiatives aim to reduce its intensity by 25% by 2025. – By Emma Harvey

Together, buildings and construction are responsible for 39% of global carbon emissions¹. Sobering though that figure is, it does mean the potential exists to make dramatic reductions.

We believe both project proponents and contractors should be setting ambitious targets to reduce carbon. Not only because we have a moral obligation to reduce the effect of our activities on the planet, but also because setting such targets stimulates innovation and can reduce costs in the long run. Gammon has made a commitment to achieve a 25% reduction in carbon intensity by 2025².

The problem with concrete

With global production of cement producing around 7% of greenhouse gas emissions, some ready-mix concrete producers such as Gammon are choosing to use lower carbon cements and develop mixes with less cement and lower carbon production processes.

Continued research and development in this area, and on other carbon-intensive materials such as steel and glass is vital, as embodied carbon emissions associated with materials throughout

the whole lifecycle of a project will become the dominant source of carbon impact from buildings. Where once the running of a building was responsible for more than the lion's share of its whole life carbon, improvements in energy efficiency and the decarbonisation of energy supplies now means this percentage is increasingly shrinking.

It's electrifying

Interestingly, one of the most effective ways the Hong Kong construction industry can reduce carbon emissions is also one of the simplest: early electrification of project sites to avoid the need for diesel generators. Planning must begin at the client design stage, when architects should also consider temporary transformer locations and start the liaison process with electricity suppliers. Contractors, too, need to provide early input, advising of their power needs based on the type of project. The catch-22 is that at such an early stage, clients have not yet selected a contractor to deliver their projects. Pre-construction studies and early contractor involvement are a good solution here.

Gammon has been lobbying hard for early electrification to become the norm, meeting with CLP and HK Electric who have responded positively, as well as engaging with our clients and EPD. We have been successful on a number of our projects, but these are the exception, not the norm. Using electricity instead of burning diesel provides obvious knock-on benefits related to health and noise impacts for neighbours and our workforce.

As an interim measure, we carried out a research and development project with local start-up, Ampd Energy, to create a viable alternative to diesel generators. The result is a battery storage system designed specifically for construction sites that emits zero direct emissions and has a reduction in carbon footprint of up to 80%.



High-performance, lower-carbon concretes with CIC Green Certification from Gammon



The energy container, or 'Ener-tainer', uses a very small amount of electricity to charge but can easily power a tower crane due to the high peak demands but long idle times

Out of site

Taking construction offsite to controlled factory settings also impacts positively on carbon emission reductions. Factories are better able to control energy use, standardisation and repetition reduces materials wastage, and the opportunities for better waste management and recycling are greater. Studies from the United Kingdom show that offsite construction uses 30% net less energy, results in 50% less waste, and reduces traffic movements by 20%.

The power of renewables

Contractors, particularly those working on multi-year infrastructure projects, are also able to contribute to electricity grid decarbonisation by participating in the Feed-in Tariff scheme and installing renewable energy at their site offices. We have successfully enabled two site-based installations and also fitted a permanent system on our Gammon Technology Park building roof in Tseung Kwan O.

It all adds up

Not all carbon-reducing initiatives require government lobbying or research and development projects, however. Even simple energy-efficiency improvements such as changing to LED lighting and turning off water dispensers at night can make a considerable difference. To support this initiative, we developed a smart energy meter that allows project teams to monitor offices and use the data to identify areas for improvement. What we have also found, is the meters support behavioural change, enthusing staff to strive for greater savings.

It is this kind of behavioural change that is needed on an industry-wide scale – where we look at construction projects through the 'lens' of whole life carbon, targeting carbon rather than only cost savings, pushing for reductions during the design phase, and considering flexibility for adaptation and disassembly for reuse and recycling. **B**

- 1 According to the World Green Building Council, Global Status Report 2017
- 2 kg CO₂e /HK\$1 million turnover, based on a 2016 baseline



200kWp solar photovoltaic system with sophisticated real-time monitoring to allow for R&D at Gammon Technology Park



Emma Harvey
Group Sustainability Manager, Gammon Construction

Gammon Construction is a leading construction and engineering services group committed to finding innovative solutions for our customers. We have built a distinguished reputation for delivering high quality and complex projects throughout Hong Kong, Mainland China and Southeast Asia. We are fully committed to building for a better quality of life and living environment in a safe and sustainable manner.

