



<i>Project Title:</i>	A Comprehensive Hong Kong Based Carbon Labelling Scheme Covering Emission Intensive Construction Materials
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<i>Project ID:</i>	CICR/06/14
<i>Research Institution:</i>	The University of Hong Kong
<i>Subject Area:</i>	Environment and Sustainability

## Objective

To establish the carbon assessment frameworks of 10 categories of emission intensive construction materials / products in accordance with ISO/TS 14067 standard.

## Background

The Construction Industry Council (CIC) completed a pilot study on the development of the first set of carbon assessment frameworks for cement, reinforcing bars, structural steel, aluminium, glass and ceramic tiles. Subsequently, the CIC Carbon Labelling Scheme (CLS) was launched in 2013. The scheme was well-received by various industry stakeholders in Hong Kong. However, due to the limited coverage of product categories in the pilot study, a full scale implementation of carbon labelling and its subsequent application for decision making at different stages may be hindered. Therefore, it is necessary to cover other emission intensive construction materials and ensure they are in line with the ISO/TS 14067 standard.

## Data and Methodology

1. Reviewed the latest development of carbon footprint assessment and labelling schemes in construction both locally and internationally;
2. Carried out Extensive literature review and consultations with material manufactures and suppliers to define the product scope and life cycle of selected product categories;
3. Developed Carbon Footprint (CFP) Quantification tools based on the identified boundary and sources of emissions in compliance with the following international standards (i) ISO 14040: Environmental Management – Life Cycle Assessment; (ii) ISO 14020: Environmental Labelling and Declaration; (iii) ISO 14024: Environmental Label and Declaration – Type III Environmental Declarations; and (iv) ISO 17025: General Requirements for the Competence of Testing and Calibration Laboratories;
4. Conducted semi-structured interviews with various industry stakeholders to unveil the implications and limitations of the green initiatives and legislations, perceptions of the carbon labelling, and how to introduce the carbon footprint assessment to the construction industry of Hong Kong.

## Results and Findings

1. Assessment frameworks were specifically designed for measuring the carbon footprint of 10 selected construction materials (ready-mixed concrete, precast concrete, stainless steel, galvanized mild steel, cast iron, brick, construction aggregate, asphalt pavement, sawn timber and plywood, and gypsum board);
2. Each carbon assessment framework comprises the: (i) definition of the product category; (ii) delineation of the system boundary and development of process map for GHG emission assessment; (iii) identification of the sources of GHG emissions; and (iv) compilation of carbon assessment tools in Microsoft<sup>TM</sup> Excel format for users to prepare their product specific carbon inventories. The initial benchmarks of the 10 selected construction materials were proposed based



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on the review of local and international databases. The proposed benchmark for stainless steel is listed below as an example.

Carbon Rating	Carbon Emission (kgCO <sub>2</sub> e/kg)
A	≤ 1.61
B	1.61 ~ 2.19
C	2.19 ~ 3.65
D	3.65 ~ 4.23
E	≥ 4.23

- Findings from the expert interviews revealed that quality and cost were the governing factors when selecting construction materials. Some constructors and developers would, however, consider that the environmental performance of the materials chosen was important. There was an increasing interest in the carbon footprint in the local construction industry; hence the CLS would encourage the use of low carbon materials.

## Recommendations

- Establish a local carbon emissions database to facilitate the assessment of the actual carbon footprint of construction materials;
- Low carbon design should be promoted to further reduce carbon emissions;
- Extend the range of the construction materials/product, and cover the other types of materials; and
- Establish an online platform for low carbon construction materials, in order to disseminate and promote the CLS.

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