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# The contribution of ISO 14067 to the evolution of global greenhouse gas standards—A review

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ABSTRACT

Due to the increasing recognition of global climate change, the building and construction industries are under pressure to reduce carbon emissions. A central issue in striving towards reduced carbon emissions is the need for a practicable and meaningful yardstick for assessing and communicating greenhouse gas (GHG) results. ISO 14067 was published by the International Organization for Standardization (ISO) in May 2013. By providing specific requirements in the life cycle assessment (LCA) approach, the standard clarifies the GHG assessment in the aspects of choosing system boundaries and simulating use and end-of-life phases when quantifying carbon footprint of products (CFPs). More importantly, the standard, for the first time, provides a step-to-step guide and standardized template for communicating CFPs in the form of CFP external communication report, CFP performance tracking report, CFP declaration and CFP label. ISO 14067 therefore makes a valuable contribution to GHG quantification and transparent communication and comparison of CFPs. In addition, as cradle-to-grave should be used as the system boundary and end-of-life phases can be simulated, ISO 14067 will hopefully promote the development and implementation of simulation technologies, with Building Information Modelling (BIM) in particular, in the building and construction industries.



**Contents**



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## 1. Introduction

Sustainable development [32] expects project development meets the needs of the present without compromising the ability of future generations to meet their own needs. One important aspect of sustainability, which is also where most of research work has been focusing on, refers to the environmental impact from industries such as building and construction. Environmental sustainability can be achieved by making building green in design and operation [6].

Climate change has emerged as one of the most pressing environmental issues in recent years. It can cause serious threats to future development, including raising sea level and causing natural disasters. According to the Intergovernmental Panel on Climate Change [14], eleven of the last twelve years (1995–2006) ranked among the twelve warmest years in the instrumental record of global surface temperature since 1850. Global average sea level has risen since 1960 at an average rate of 1.8 mm/year and since 1993 at 3.1 mm/year, which has considerable impact on future development (Intergovernmental Panel on [14]). Billions of people are exposed to natural disaster risks, including weather-related disasters that take lives, damage infrastructure and natural resources, and disrupt economic activities [27].

There is broad consensus that global climate change is caused by an increase in GHG emissions from both natural and man-made sources [10]. If actions were not taken to reduce GHG emissions, the overall costs and risks of climate change would be equivalent to losing at least 5% of global GDP per year, now and forever [30]. In particular, human activity is believed to be the most significant source of emissions, which is mainly caused by fossil fuel consumption. The quantification of human activity on the global GHG emissions level calls for a systematic assessment method. There is also an increasing desire from retailers and other supply chain organizations to better understand, and in some cases, communicate a consumption-based perspective of the carbon footprint of products [3].

There are a number of attempts to develop a globally recognized mechanism to assessment the carbon footprint of products (CFPs) across their life cycle. Publicly Available Specification (PAS) 2050 was published by the British Standards Institution in Oct 2008. It includes detailed requirements for the assessment of GHG emissions arising from goods and services [29]. World Resources Institute (WRI)/World Business Council for Sustainable Development (WBCSD) developed the greenhouse gas protocol for product accounting and reporting standard (hereafter referred to as WRI/WBCSD: The GHG Protocol) in 2001. WRI/WBCSD: The GHG Protocol was revised and published in 2011 to provide a general framework to support GHG quantification and reporting for many different types of products [40]. Although PAS2050 and WRI/WBCSD: The GHG Protocol have similar standards and are unlikely to result in significant differences in measurement outcomes, the industry needs one uniform and globally recognized standard for assessing and communicating GHG results at a practical level. ISO 14067: Carbon footprint of products—requirements and guidelines for quantification and communication was published in May 2013. It brings significant changes to current carbon labelling schemes in terms of allowing transparent communication of GHG results and can be used as the uniform standard for assessing and communicating GHG results. While there are many similarities among the three internationally recognized GHG standards, ISO 14067 clarifies and details the assessment method by providing some specific requirements on the selection of system boundary and simulating use and end-of-life phases. More importantly, it proposes a standardized communication program based on which GHG results can be transparently communicated with customers to allow them to make informed decisions.

Buildings accounted for 36% of final energy consumption among the International Energy Agency's member countries in 2004 [12]. This paper therefore aims to examine how ISO 14067 assesses and communicates GHG results. It is believed that the findings from this study will help understand the contribution of ISO 14067 to the evolution of global GHG standards and its impact on the building and construction industry.

## 2. The development of ISO 14067

The standard was proposed in the first ISO/TC (Technical Committee) 207/WG (Working Group) 2 meeting in April 2008. It was developed by over 100 experts from more than 30 countries, including developing countries such as China, Argentina, Indonesia, etc., and received a large number of comments from international involvement. According to ISO [15], the first draft of ISO 14067 received 578 comments on *Part 1: Quantification* and 184 comments on *Part 2: Communication*. However, due to the objection raised by some countries, ISO 14067 was published as a Technical Specification rather than an internationally recognized standard in May 2013. The Technical Specification will be reviewed by May 2016 to determine whether it will be revised, withdrawn or published as an international standard.

ISO 14067 specifies principles, requirements and guidelines for the quantification and communication of the carbon footprint of products (CFPs), covering both goods and services, based on GHG emissions and removals over the life cycle of a product [18]. The standard was developed based on previous international standards on environmental labelling and environmental management, including:

- ISO 14020: Environmental labels and declarations—general principles.
- ISO 14024: Environmental labels and declarations – Type I environmental labelling – principles and procedures.
- ISO 14025: Environmental labels and declarations – Type III environmental declarations – principles and procedures.
- ISO 14040: Environmental management – Life cycle assessment – principles and framework.
- ISO 14044: Environmental management – Life cycle assessment – requirements and guidelines.

The standard has two main objectives. It aims to standardize the quantification principles and procedures when assessing CFPs. A complete CFP study in ISO 14067 should include a CFP quantification process, a CFP study report based on the results from the CFP quantification and a critical review based on ISO 14044. It should be noted that the critical review in ISO 14067 is different