

APPLICABILITY OF EXISTING CARBON TRADING SCHEMES TO THE CONSTRUCTION INDUSTRY

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Summary

It is well recognised that considerable amount of carbon is released throughout the life cycle of construction facilities. To help alleviate the effect of climate change, the construction industry should identify and adopt pragmatic measures to cut down on carbon emissions. A possible way to achieve that is by means of carbon trading. While there is no shortage of successful carbon trading examples, the attention is primarily on trading of carbon arising from the manufacturing of highly emitted construction materials like cement and steel products. The potential of extending carbon trading to other construction phases including the construction, operational, refurbishment and demolition stages is largely ignored. This paper aims to examine whether carbon trading is a suitable approach to reduce construction emissions. The paper begins by introducing the concepts of carbon trading. It is then followed by reporting the results of a semi-structured interview carried out in Hong Kong. The paper concludes by discussing the way forward of carbon trading in the construction sector.

Keywords: carbon emissions, carbon trading, construction industry, global warming

1 Introduction

The adverse effect of global warming has called for a substantial reduction in carbon emissions. With the adoption of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, some industrialised countries commit themselves to limit or reduce their emission of carbon to an agreed level. One way to realise the mission of emission reduction is through the introduction of carbon trading schemes.

Currently, there are two basic market-based approaches to reduce carbon emissions namely (i) cap and trade, and (ii) base-line and credit. Despite the advantages of carbon trading, some have questioned the effectiveness of these schemes. The suitability of carbon trading schemes to the construction industry should be carefully examined, as this sector accounts for a significant proportion of all sources of carbon emissions globally (*cf.* Stern, 2006).

To determine whether the existing carbon trading schemes are relevant to the construction industry, one should first identify the sources of emissions in this sector. In fact, the emissions arising from construction activities can be classified into those which are related to the process and energy. The process-related emissions include those arising directly from the production of construction materials like cement and steel. In contrast,

the energy-related emissions refer to the emissions generated as a result of the construction activities and/or caused by the transportation of construction materials.

The aim of this paper is to examine whether carbon trading is a suitable mechanism to reduce carbon emissions arising from the construction industry. In this paper, the views of various stakeholders involving in a construction project are captured through semi-structured interviews. Their perceptions on the effectiveness of the existing carbon trading scheme as well as the way forward of carbon trading in the construction sector are identified before a conclusion being drawn.

2 Carbon trading schemes

There are two basic market-based approaches for reducing the carbon emissions namely (i) cap and trade, and (ii) baseline and credit. Under the cap and trade schemes, the regulator would set a maximum amount of emission allowance to the participants, and one should attempt to reduce its emissions so that extra emission allowances can be freed up for sale. Those failing to meet the capped emission figure would have to purchase extra allowances from the others. The European Union Emission Trading Scheme (EU ETS) is one of the largest emission trading schemes of this kind.

The baseline and credit approach is indeed a project-based transaction system. Using this approach, emission credits would be allocated to those participants who manage to reduce their emissions to a level below their own baseline. The remaining emission credits can be sold to the others for profit. The Clean Develop Mechanism (CDM) and Joint Implement (JI) under the Kyoto Protocol are examples of the baseline and credit systems.

It is worth noting that the EU ETS, CDM and JI are classified as mandatory trading schemes as emission trading is mandated by the government or an authority. Yet, carbon can also be traded at the voluntary carbon markets. Many voluntary trading systems are project-based transactions. Unlike mandatory trading, the voluntary market is relatively free with a variety of participants who would like to offset their own carbon emissions or even to offset their customers' emissions. Despite that, as the voluntary market is not governed by any regulated reduction regime, the effectiveness of carbon reduction cannot always be guaranteed. Moreover, a lack of rigorous verification on the carbon credits generated may increase the participants' risks.

3 Stakeholders perception on carbon trading in construction

To solicit the views on whether the current carbon trading schemes are applicable to the construction industry, experts of diverse backgrounds including the government, design team, contractor, sustainability consultant and economic sector in Hong Kong were interviewed. The results are summarised in the following sections.

3.1 Potentials

Increased awareness: Sustainable development should be the responsibility of every single individual. As the awareness of construction stakeholders in emission reduction increases, many have already committed to reduce the emissions of their construction facilities and operation voluntarily. By setting targets for the amount of emissions, those who are yet to reduce their emissions will act and change their emission behaviour.

Competitive advantage: It is a trend for clients to enhance the sustainability of their construction facilities. Nowadays, designers and contractors who can come up with green design solutions, sustainable construction techniques and/or low carbon materials are more likely to secure the projects. This is evident in Hong Kong when the Hong Kong Housing Authority introduces the “Innovative Procurement” method to attract and reward novel concepts which can improve the sustainability of their projects. Likewise, carbon trading can be an incentive to create a market force for carbon reduction.

3.2 Pitfalls

Higher cost: The interviewees opined that it may not be possible to keep lowering the emissions cap as the cost could become very high once the target goes beyond a certain limit. The contractors interviewed were particularly sceptical about the possibility of further reducing the emissions of the site operations as the use of any new construction technologies and/or replacement of old equipment can be costly due to the high capital investment and steep learning curve. They worried that an unrealistic emission cap could increase their uncertainties and jeopardise their profit. Some interviewees in turn proposed turning the attention to the operational phase of a construction facility as it would be easier to set a cap on carbon emissions.

Economics impacts: It is possible that some clients would choose to reduce their investment in construction facilities if the cost of reducing the carbon cannot be offset by the profit gained from the finished facilities. This could affect the growth a company and economic development. This is particularly the case if the cap for carbon emission is too stringent or when further reduction in emissions becomes too difficult to achieve.

Lack of effective monitoring: Whether carbon trading is an effective mechanism or not depends on the existence of a rigorous monitoring system. Some interviewees believed that carbon trading schemes may not be able to stop the highly emitted companies from existing if they can buy credits from the others given the cost for offsetting their emissions is lower than that for introducing a carbon reduction technology or low carbon production process. As a result, rigorous and transparent regulations should be put in place to control the carbon trading market so that carbon trading would not become a mechanism for some companies to escape their responsibility or gain extra profit. Any successful carbon trading schemes should be supported by a mature and regulated market, and there is no different to the construction industry.

Training and education: Carbon trading is indeed a very new concept to the local construction industry. The problem is aggravated when the carbon trading schemes are not originally developed for the construction industry. Therefore, it is necessary to appoint suitable persons to management the carbon trading schemes. In the absence of sufficient expertise to set up and implement the schemes, it is essential to allow sufficient time so as to allow industry stakeholders equipping themselves with the knowhow. Moreover, construction companies should invest in training in order to increase their staff’s awareness in carbon trading and emission reduction.

4 Future of carbon trading schemes

Carbon released by the construction industry consists of that from raw material extraction, manufacturing, transportation, site operation, facility usage and demolition (Gerilla *et al.*, 2007). The amount of emissions arising from the construction industry justifies the use of

carbon trading schemes to increase the emission reduction opportunity. Perhaps as a starting point, the construction industry should pilot the use of the mandatory trading schemes so as to ensure suitable regulators or authorities are administering the systems in a systematic manner. The voluntary trading schemes may then be introduced as a long-term solution to encourage more participants to get involved in the carbon trading and emission reduction exercise. Successful implementation of carbon trading schemes in the construction industry depends on the availability of rigorous and transparent standards as well as the ability to set realistic caps or baselines. For that, it is necessary to engage as many participants as possible before the carbon trading schemes are introduced.

Apart from carbon trading, other pragmatic policies such as carbon tax can also be considered. Carbon tax is not only easier to understand, but it may also achieve a more immediate outcome. Nevertheless, some may regard carbon tax as a penalty to the carbon emitters irrespective of their performance and dedication in emission reduction not to mention about the challenges in setting up an acceptable tax rate.

5 Conclusions

In this paper, the applicability of the existing carbon trading schemes has been explored. The results of the interviews show that construction stakeholders in Hong Kong have grave concern about the carbon trading schemes. However, as more and more construction clients, designers and contractors are aware of the importance of carbon reduction, any schemes that would help reduce carbon emissions should be seriously considered.

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