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A COMPARATIVE STUDY OF THE EFFECT OF CARBON TAX ON THE CONSTRUCTION SECTOR

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ABSTRACT

There has been a considerable debate on the effect of carbon tax on the Australian construction sector. Recent industry reports have already indicated that the practitioners dislike carbon tax and merely believe that the tax would be revenue neutral. However, stories from some countries showed that the introduction of carbon tax may not be as disastrous to the sector. While anecdotal evidence and facts about the effect of carbon tax co-exist, pragmatic solutions may be hard to collate. This paper reports a study that seeks to investigate the effect of carbon tax on the Australian construction sector. Lessons learned from the European Union (EU) were reviewed. The findings from the literature review suggested that the carbon tax may provide a positive impulse for benchmarking emissions driven from construction activities. However, the experience from the EU also tell us that in response to the new tax, carbon emission-intensive industries, such as construction, are keen to find leeway to evade their responsibility. While the carbon tax may arouse concerns within the construction sector, such concerns may not necessarily be integrated with behavioural change.

Keywords: carbon tax, construction, behavioral change

INTRODUCTION

The introduction of carbon tax has been coined as a righteous response to the climate change (DCCEE, 2011). By levying the largest polluters on their greenhouse gas emission, governments can have additional resources to support alternatives such as green electricity (Pettinger, 2011). The introduction of carbon tax seeks to induce companies' behavioural change, ensuring that environmental initiatives are a more cost effective option, rather than paying a tax on emissions. In this aspect, some researchers anticipated that the carbon tax would encourage the construction sector to develop more sustainable and greener approaches in design and production (Madew, 2011, Parag and Darby, 2009; RAE, 2010). They believed that the tax would foster technological advancement and operational change. Nevertheless, others argued that the tax would merely accelerate the shift of dissectible polluting operations from Australia to another country, where the cost of carbon is tax-free (CIE 2011).

Some researchers based on some hypothetical models and simulated the likely effect of the carbon tax on the economy. For examples, Bruvoll and Larsen (2004) adopted a Computable General Equilibrium (GCE) Model to investigate the effect of carbon tax on the economy of Norway during 1990s. A mild drop of the household energy consumption and the Gross Domestic Product was found over the period. However, the effect of carbon tax on the construction sector was not investigated. Scrimgeour et al. (2005) adopted a similar GCE Model to stimulate the effect of carbon tax on energy, carbon and petroleum products in New Zealand. The simulation results showed that despite carbon tax is more effective than petroleum tax in reducing emissions, its adverse effects on the Gross Domestic product,
exports and investment can be irrevocable. Bordigoni et al. (2012) employed an input-output (IO) model to investigate the effect of carbon tax on the domestic energy prices. A simulation of an effect of a carbon tax of €20 per tonne of carbon emission on all European industries was conducted. It was found that the tax would induce unbalanced financial burden on only few industries, such as paper production, iron and steel, basic chemistry and non-metallic minerals. However, the associated ripple effect on the construction industry was not investigated.

In Australia, the carbon tax will come into force on the 1st of July 2012. Recent critics from the media indicated that the construction industry opposes the carbon tax and merely believes that the tax would be revenue neutral (Pettinger, 2011). Many professional institutes raised their concerns regarding the new tax (Harnisch, 2011, Madew, 2011). However, similar stories in other European Union (EU) countries showed that the carbon tax may not be as disastrous as the construction sector believed (BSI 2004, BBF 2009, Parag and Darby 2009). Moreover, the reasons behind such observation may be quite thought-provoking.

This paper reports a study that aims to investigate the likely effect of carbon tax on the Australian construction sector. Experience from the EU where carbon tax has been put in place is reviewed. EU has the world’s largest emissions trading scheme that is bundled with a carbon tax. In addition, its members such as the United Kingdom and Germany are the world leaders in green initiatives and green energy solutions which have done extensive research on carbon reduction. Their experience may help answer some of the questions lingered around the Australian construction sector. Furthermore, since there were diverse views found in regards to the effect of carbon tax on the construction sector, this makes it interesting to study the underlying reasons. In particular, while anecdotal evidence and facts co-exist, pragmatic solutions that help the industry reduce carbon emissions may be hard to collate. This paper is organized as follows: first, the operational framework of the carbon tax in EU is introduced; second, the effects of the carbon tax on the EU’s construction industry are reviewed; third, experience drawn from the EU is critically compared with the concerns of the Australian construction sectors.

**EFFECTS OF CARBON TAX ON THE EU’S CONSTRUCTION SECTOR**

Since the early 1990s, carbon tax has been enacted in a number of European Union (EU) countries (Pearce, 2005). The first piece of legislation in this regard is the CO₂ tax that was passed in Finland. Other member states like Denmark, Netherlands, and Sweden followed suit. To align with the member’s individual commitments under the Kyoto Protocol, the EU launched an Emissions Trading System (EUETS) in 2005. Member states are allowed to set the emission caps and allocate equivalent amounts of tradable permits to the targeted industry sectors based on their own situations. The permits are bundled with a tax of up to 30 Euros per tonne of CO₂ emissions. Industry sectors are encouraged to meet the predetermined caps by reducing emissions. However, they can also maintain their carbon-intensive operative modes by purchasing surplus permits (if available) in the market. The EUETS has engendered a new wave of legislation or refinement of the carbon tax of the member states.

Based on a literature review, the effects of the carbon tax on the EU’s construction sector are identified as follows:
Better benchmarking

It is not mandatory for the construction sector to report their carbon emissions to the European Environment Agency. Logically the sector has no urgent need to develop the carbon emission reporting system. However, the carbon tax has increased the construction sector's awareness of its ways of operations (Acquaye and Duffy, 2009). Designers and contractors have become more cautious about the use of heavily carbon-embodied materials in their projects. The carbon tax has led the professional institutes to become more enthusiastic in establishing benchmarks of carbon emissions. Voluntary green building rating systems like the Building Research Establishment Environmental Assessment Method (BREEAM) has started to gain recognition from the practitioners (Office Depot 2009). Carbon tax has become a good reason for promoting a better management of emissions. Global Reporting Initiatives (2011) developed guidelines, specifically for the construction organizations to report their sustainability performances. Assessment of sustainability performance of an organisation is conducted in three aspects: Strategy and Profile, Management Approach, and Performance Indicators. However, the proposed guidelines are not project-specific. In this aspect, the European Network of Construction Companies for Research and Development (ENCORD) developed an inventory that specifically evaluates contractor's carbon emissions in a construction project. As such, the carbon tax may have fuelled the sector to develop a more industry-specific and robust emissions benchmarking system.

Passive reaction to the cost jump

Matched with the warnings from the sector, the prices of emission permits appeared to have direct effect on electricity prices. For example, the electricity price of Netherland and Germany rose between 60 to 117% a year after the enactment of the carbon tax (Green, 2009). Carbon tax was found to have negative impact on the energy-intensive sectors of the EU countries (Zhao, 2011). The response from the sector was quite diverse. On one hand, the construction contractors became more prudent in energy consumption; however, such response appeared to be a voluntary and pure business decision of the contractors (HM Government 2010). Indeed the contractors would neither be penalised nor rewarded by the change of electricity consumption manners. On the other hand, contractors and consultants are merely project executers who have neither a contractual right nor a responsibility to challenge the building materials to be used. Final design decisions are typically made by the developers or their in-house professionals. Collectively bound by the project-based collaboration mechanism, construction contractor and consultant firms in some sense are disabled to change their emission behaviours in isolation (Spiegel and Meadows, 1999).

Uncooperative attitudes

From a developer's perspective, design considerations are related to capital costs and profitability of the developments. Carbon tax does incur additional cost to those future occupants throughout the life-time of the building. However, this part of additional cost has negligible effect on the developers, unless the building is commissioned for their own use. For most of the developers, consultants, and contractors, who are neither accountable for the energy efficiency of, nor have a long-term interest in the buildings, have no liability and legitimate reason to change their behaviour because of the carbon tax (BSI 2004, BBF 2009).
This may help to explain why some recent case studies indicated that most construction designers and contractors in UK did not follow the low-carbon best practice guides published by the government (Sorrell 2003). Indeed, changing operative modes involve investments in research and instruments and up-skilling labours. The cost of carbon reduction may further erode the already low profits that the companies can earn from the construction projects. As such, emission reductions may hardly become an encapsulated interest among contracting parties in the construction project (Parag and Darby 2009). Recent research studies in Europe revealed that providing appropriate financial assistance schemes to the construction sector may be a more effective method to foster behavioural change (Schleich, et al. 2009, Wallace, et al. 2010). Wallace et al. (2010) further suggested that tax rebate can be an essential reward to investments of carbon reduction. A report from UNEP (2009) supported that capital subsidies, grants, and loan schemes can facilitate organisations’ introduction of new strategies to reduce carbon emissions.

They are price-makers!

A numbers of studies have already pointed out that although the construction sector is one of the heaviest users of the materials and energy, it does not need to change in response to the carbon tax (Green 2008, Schleich et al. 2009). Different to other industries which are subject to intensive competition from imported goods or services, in the construction sector it is possible to pass onto real estate buyers the additional costs incurred by carbon emission. It is not suggested to coin such findings as evidence that carbon tax is ineffective to foster carbon reduction. However, the results reveal the importance of conveying a sense of immediacy in policies to drive behavioural change.

POTENTIAL EFFECTS ON THE AUSTRALIAN CONSTRUCTION SECTOR

The above reported effects adumbrate the likely reactions that the Australian construction sector may take in face of the carbon tax.

Similar to the EUETS, the Australian carbon tax merely targets around 500 firms allegedly accounting for most of the national carbon emissions (DCCEE 2011). Most companies that are engaging in the construction sector are not likely to be directly affected. However, the construction industry is the heaviest user of the materials and energy that would potentially be taxed. An independent report by Davis Langdon (2011) indicates that construction material costs, such as concrete and steel could rise up to 5% as an immediate effect of a $23 tax per tonne of carbon emissions. In principle, the construction sector will be a potential loser under the tax. Likewise, many local professional institutes like the Master Builders Association and The Housing Industry Association warned that the construction cost will sky rocket (Harnisch, 2011). However, such reactions have already casted doubts by some government officials and the general public because these indicated the industry’s intention to pass the additional cost onto the end-users (Harnisch, 2011). In line with the stories we learned from the EU countries, passing additional cost onto the customers is an option open for the construction sector. This in some extent exposes the glitches of the carbon tax mechanism. In addition, whereas the associated cost can be passed on, the effect of carbon seems not to be as daunting as the construction sector described.
In spite of the worries being expressed by the industry, some recent reports also indicated that only few companies have acquired enough information of how they will be financially impacted by the carbon tax (CIE, 2011). One of the major reasons is that the companies in the construction sector are not directly involving themselves within the emissions trading market. Whereas the majority being negative impacts, a study conducted by McDougall (1993) in early years suggested that the carbon tax may drive further investment in advance technology and lead to an expansion of the gross value of the construction activities. However, recent studies in EU countries revealed that there is no direct linkage between the carbon tax and the increase in capital investments (Green 2008, Schleich et al. 2009). The findings may be understandable as the construction projects are typically awarded to the lowest-bidders. For construction organisations, investments are dominated by commercial consideration, especially when the profitability is unrealisable.

In Europe, the carbon tax has led the professional institutes to become more enthusiastic in developing benchmarks of carbon emissions, and similar observations were made in Australia. The Australian Building Codes Board (ABCB) introduced a Nationwide House Energy Rating Scheme (NatHERS) with an aim to accredit energy efficient buildings. This, to some extent has enhanced the sector’s self-regulation in design and operations (Madew 2011). It is worth-noting that in Europe, tightening building standard appeared to be a more effective approach to drive behavioural changes. (Sorreal, 2003, Miozzo and Dewick 2004) Likewise, Victoria State government have tightened their regulations to disapprove new construction and alteration works that fall below the NatHERS 5 star standards (Madew 2011). The tightening regulations may force the construction sector to move towards low-carbon operations.

THE CONCLUDING REMARKS

The price surge as a result of the carbon tax inevitably will affect the construction sector. However, the associated additional costs may not weaken the sector’s viability. While passing the cost down to the end-users may be a preferred option, the ultimate goal of transforming the construction sector into a low-carbon industry may become difficult to achieve.

This review aptly reminds us that no single policy can fundamentally change the carbon-intensive operative modes of the construction sector. However, the construction sector may need to review whether passing-on additional cost is a pleasing response to the expectation of the society. On the bright side, the carbon tax may drive the sector to rethink their ways of operations and become more cautious about the use of heavily carbon-embodied materials in building developments.

This study can be treated as a step forward to understanding the effect of carbon tax on the construction sector. However, it is acknowledged that this study has its own limitation. Firstly, this paper merely reports the lessons learned in the EU. The findings, despite being backed up by literature, are required to be validated by the use of empirical data. In this aspect, data can be collected through conducting an industry survey or case studies in Australia.

REFERENCES


