Ready Mixed Concrete and Climate Change Legislation

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Introduction

The burning of fossil fuels, deforestation, certain farming practices and industrialization over the last century and a half have released large amounts of greenhouse gases (GHGs) into Earth’s atmosphere, effectively increasing the global temperature and changing its climate. The altered climate and warming trends are thought to be responsible for recent severe weather and diminished robustness of some plant and animal species and their habitats.(1) In order to counteract these changes it is likely in the near future that the federal government will enact legislation to limit GHG emissions, such as carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O) and fluorinated gases.(2) The implications on the ready mixed concrete industry of past and current proposals are widely unknown. The National Ready Mixed Concrete Association (NRMCA) is examining GHG regulatory schemes and their key elements to determine the potential implications on this important industry.

Purpose

The intent of this paper is to:
1. Examine different regulatory schemes that could be instituted by federal climate change legislation
2. Discuss the potential impact of climate change legislation on the ready mixed concrete industry.

Regulation Types and Key Elements

The most likely mechanisms for addressing greenhouse gas emissions are a carbon tax, command-and-control emission regulation, and a cap-and-trade system. These three approaches, with variations, are examined below.(3)

1. Carbon Tax

A carbon tax is a simple tax that could be levied on every ton of carbon dioxide that is emitted. This regulatory tool aims to encourage sources to reduce GHG emissions by taxing each unit emitted, thus theoretically spurring the development and adoption of technologies to reduce GHG emissions.

Example: British Columbia, Canada, instituted an industry wide carbon tax program on July 1, 2008 regulating CO2 emissions from all fossil fuels.(4)

2. Command-and-Control

A command-and-control method is not an incentive-based program; rather it mandates that covered entities or industries employ technologies that help reduce GHG emissions. Such a program would likely demand that covered entities meet a certain reduction goal or emissions cap, but would not allow for an emissions allowance system, as described below.

Example: Mandating specific miles per gallon on the vehicle fleets of United States automobile manufacturers through CAFE (Corporate Average Fuel Economy) standards.(5)

3. Cap-and-Trade

“Cap-and-trade is a policy approach for controlling large amounts of emissions from a group of sources. The approach first sets an overall cap, or maximum amount of emissions per compliance period, for all sources under the program. The cap is chosen in order to achieve a desired environmental effect. Authorizations to emit in the form of emission allowances are then allocated to affected sources and the total number of allowances cannot exceed the cap. Individual control requirements are not specified for sources; instead, sources report all emissions and then surrender the equivalent number of allowances at the end of the compliance period. Allowance trading enables sources to design their own compliance strategy...
Potential Impacts

The impact of climate change legislation on the ready mixed concrete industry will most likely be seen on three fronts: cost, supply and demand.

The cement industry has been labeled an energy intensive industry\(^\text{(12)}\)\(^\text{(13)}\) due to its high level of CO\(_2\) emissions, which account for 1.5% of the total U.S. CO\(_2\) emissions.\(^\text{(14)}\) This fact makes it likely that the cement industry will be covered under any of the detailed regulatory systems. This could obviously have indirect adverse impacts on the ready mixed concrete industry.

On the other hand, concrete can be used to create energy efficient structures and pavements that have the potential to significantly reduce fuel use over their lifetime. This could mean that concrete applications could provide a net GHG reduction, despite the emissions associated with the material’s cement component. This could result in offsets for concrete manufacturers or users that could provide financial and marketing benefits to the industry.

NEGATIVES:

• Cost

Two areas thought to be hit hardest by the enactment of climate change legislation are the energy sector and petroleum refiners. Greater regulation of both sources would raise the cost of energy and fuel prices.\(^\text{(20)}\)\(^\text{(21)}\) Energy and fuel are two vital components for the manufacturing and transporting of cement.\(^\text{(17)}\) If the cost of either of these two facets increases, so does the cost of cement. In addition, cement manufacturing is likely to be regulated not only on the associated combustion emissions, but on calcinations emissions as well. Any increase in the cost of and/or transportation of cement will invariably increase the cost of ready mixed concrete;\(^\text{(18)}\) as cement is a basic element of concrete.\(^\text{(19)}\)

In substitute of or in addition to cement, the ready mixed concrete industry uses industrial byproducts such as fly ash, blast furnace slag and silica fume. These supplementary cementitious materials (SCMs) come from other energy intensive industries, which most likely will be regulated as well. The regulation of these industries will potentially drive up the cost of SCMs; further increasing the cost of concrete.

The fluctuation in the price of cement and/or SCMs and therefore concrete could have implications effecting the supply and demand of all three products.

• Supply

An increase in the cost to produce cement could have the effect of reducing the overall supply of cement in the United States. In order to meet a specified emissions reduction target, it is possible that cement plants would have to cut their cement production, relocate to foreign countries with no or less stringent emissions controls, or shut down operations all together.\(^\text{(22)}\) A downturn in the domestic production of cement could mean a reduction in the potential amount of ready mixed concrete to be batched each year. By increasing the cost of domestically produced cement, thereby decreasing the supply, many ready mixed concrete plants

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actual emission.\(^\text{(7)}\) Systems employing either of these regulation points could have different variations.

“Example: Since the 1980s, there has been a cap-and-trade program in the United States governing the emissions of sulfur oxide and nitrous oxides in order to control acid precipitation.\(^\text{(6)}\)

The contrasting points of regulation are known as upstream and downstream and are further described below:

a) Upstream – With an upstream cap-and-trade system, the cap is applied to materials and/or products that will eventually emit a GHG.

Example: Requiring emission allowances for the extraction of coal or oil.

b) Downstream – With a downstream cap-and-trade system, a covered entity is charged an emission allowance at the point of emission.

Example: Requiring emission allowances for a cement plant emitting CO\(_2\) through combustion or calcinations or a power plant for coal combustion.

Other key concepts associated with cap-and-trade programs are:

• Safety Valve – A safety valve is a price cap for emission allowances. When the price level is reached, the regulating authority would offer additional allowances for sale at that price. This would enable covered entities to purchase emission allowances above the number of already allotted allowances available in the marketplace in the event that the safety valve level is met. Typically, these allowances are unlimited. The purpose of the safety valve concept is to provide some economic certainty and political comfort with prospective cap-and-trade programs.\(^\text{(8)}\)

• Leakage – Some fear that a cap-and-trade program would increase costs of materials and their production, forcing more imports of materials or products from unregulated foreign countries. This could cause a shift – or leakage – in emissions from the United States to foreign countries and actually thereby increase emissions from less efficient manufacturing and increased shipping. To ensure this does not occur, a provision can be written into a program to regulate, limit or ban imports.\(^\text{(9)}\)

• Offset Allowance – An offset allowance, traditionally used with a cap-and-trade program and also known as a ‘carbon credit,’ “...is a measurable reduction, avoidance or sequestration of GHG emissions from a source not covered by an emission reduction program. ...offset projects could generate ‘emission credits,’ which could be used by a regulated entity to comply with its reduction requirement.”\(^\text{(10)}\) Non-regulated entities earning offsets could sell them to regulated entities who would in turn use them to ensure compliance.

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would potentially be forced to buy cement from foreign markets. U.S. concrete companies could also face more litigation involving bad concrete due to imported cement manufactured under poor quality controls. Finally, increased shipping costs from imports and domestic fuel hikes could further increase concrete costs.

• Demand

An increase in the cost and/or reduction in the supply of cement could potentially reduce the demand for ready mixed concrete if those factors raise the price of concrete too high. A decline in the demand of concrete fueled by a decline in its supply could mean closures of U.S. ready mixed concrete plants. In addition, if concrete is not effectively promoted as an energy efficient product, it could be unfairly branded as having a high carbon footprint based only on its cement component, further reducing demand as markets encourage green products.

POSITIVES:

• Cost

An increase in the price of ready mixed concrete due to climate change legislation could possibly mean more revenue for concrete producers. This could be because of greater room to play with profit margins. Effective promotion of concrete as a green building and paving material could also enhance the desirability and thus the price of the product.

• Supply

New technologies driven by greenhouse gas regulation could spur the development of more efficient means of manufacturing cement or SCMs. This could actually augment the supply of the cementitious component required for concrete production.

• Demand

As cited above, effective promotion of concrete as a green building and paving product could dramatically increase its demand, directly benefiting the industry as a whole. In addition, such effective promotion could enable concrete manufacturers or users to obtain offset allowances. If concrete manufacturers earn these allowances, they will have a direct financial gain. If their customers earn the allowances, the demand for – and therefore price of – concrete could increase.

*Offset allowances could possibly be obtained through more utilization of the NRMA’s P2P initiative, greater use of SCMs, use of photocatalytic (smog-eating) cement in concrete mixtures, emphasizing automobile fuel savings through greater use of concrete pavements and stressing the Life-Cycle Cost Benefits of concrete.*

There are complications associated with obtaining offset allowances. For example, retail giant Wal-Mart plans to include a new provision in its construction contracts that would stipulate that any offset allowances derived from the use of fly ash in concrete used on Wal-Mart construction jobs would be the property of Wal-Mart.

References


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