

15. Measurement of Carbon Emissions by Kansas Agribusiness Retailers

Michael Boland

<mboland@agecon.ksu.edu>

Michael Boland is professor of agricultural economics and associate director of the Arthur Capper Cooperative Center where he has teaching, research, and extension appointment in agribusiness management and cooperatives.

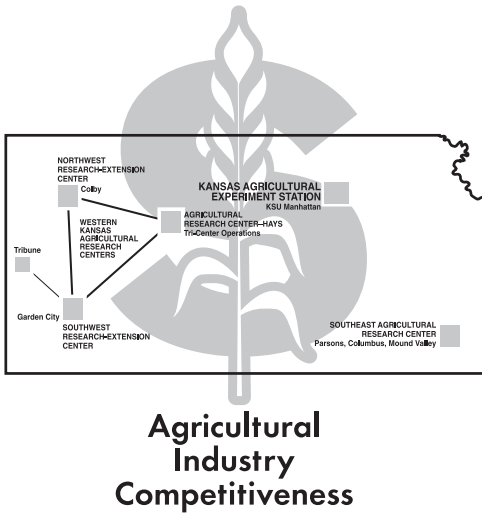
Elizabeth Canales

<BethCanales@agecon.ksu.edu>

Elizabeth Canales is a PhD student in agricultural economics and is from Honduras where she did her undergraduate agribusiness degree at Zamorano University. This research is from her masters thesis.

Abstract/Summary

Retail agribusinesses are exempt from the proposed cap and trade legislation passed by the U.S. House of Representatives. However, it is not clear what future proposed regulations might look like. The objective was to estimate the impact of the regulation to determine a baseline cost for Kansas cooperative agribusiness retailers. The cost of compliance (if they were not exempted) for the larger cooperatives was less than \$10,000 per location and the average locations had emissions much less than 25,000 tons per year. The main impact of the proposed regulation is likely to be higher fertilizer and energy prices which would be passed on to the retailers (and presumably producers) by wholesalers.



Economic Issues with Climate Change Legislation and Its Effect on Kansas Agricultural Cooperatives

Enhance the value of Kansas Agricultural goods

In an attempt to decrease greenhouse gas emissions and their negative effect on the environment, H.R. 2454, the American Clean Energy and Security Act (Waxman-Markey Bill) of 2009 was passed in the U.S. House of Representatives in June of 2009. The main objective of this bill is to mitigate greenhouse gas emissions and to increase energy efficiency. A cap-and-trade system was proposed to achieve emission reduction goals (83 percent of 2005 levels) by 2050. Regulations will apply to greenhouse gas emissions from primary energy suppliers.

Regulated entities under the H.R. 2454 bill are any electricity generator, producer, importer, or distributor of fuels whose combustions emit 25,000 metric tons of CO₂ and other industrial sectors (e.g., petroleum refinery, lime manufacturing, and cement production).

Under a cap-and-trade system, the government would distribute a limited number of allowances to companies. Industries emitting greenhouse gasses in excess of their allocated allowances would have the opportunity to purchase carbon credits from an open market.

Even though agriculture is not covered under the current legislation, awareness of the potential consequences of climate legislation is essential for agribusinesses. To date, there are differing opinions on whether the agricultural sector will benefit or not from a cap-and-trade program to regulate greenhouse gas emissions. Golden, et al. (2009) analyzed the differences among different studies and their overall

effect on agriculture. This publication analyzes the impact on Kansas retail agricultural cooperatives that are owned by farmers and ranchers.

Calculating the Carbon Footprint of an Agricultural Cooperative

Kansas agricultural cooperatives were invited to submit energy data for this study. Nine cooperatives, which included some of the largest operations in the state, participated in the study.

In order to estimate their carbon footprint, the carbon dioxide emissions associated with energy use from daily operations and services must be determined. Carbon dioxide emissions are estimated for each energy input and are found by multiplying the energy used by a carbon emission factor. Generally, sources of energy used by agricultural cooperative operations in Kansas are gasoline, diesel fuel, natural gas, propane, and electricity. Electricity-related emissions are released at the power station and are not attributed to the retail operation. For agricultural cooperatives in Kansas, diesel fuel represents the largest source of emissions. Cooperatives with a strong agronomic service component and higher diesel fuel use tend to have higher direct emissions as opposed to cooperatives with more locations specialized in grain marketing and retail sales due to lower gas use.

The proposed threshold for a covered entity under the cap and trade bill is 25,000 metric tons of

CO₂. The average quantity of CO₂ produced by these cooperatives was 1,271 metric tons of CO₂ with a minimum of 104 and a maximum of 3,103 metric tons of CO₂. These results are good news for agricultural cooperatives, because their emissions are far less than the proposed emission threshold, demonstrating that they are not likely to be regulated.

Studies project carbon prices of \$10 to \$50 metric tons of CO₂ under different scenarios as discussed by Golden, et al. The historical prices of CO₂ emissions are shown in Figure 1. The low prices for CO₂ are due to the fact that the existing carbon allowances set forth in the European Union are much greater than the cost of compliance. Thus, the demand for CO₂ has decreased steadily since firms have no need to buy any carbon credits. Increases in prices will be driven by increases in demand, which is not likely to happen unless Congress passes cap-and-trade legislation, creating a demand for carbon credits.

For this study, three different prices per metric ton of CO₂ were chosen, representing the July 2010 price (\$0.10), the highest price registered since 2004 in the Chicago climate exchange market (\$7.40), and the projected 2012 price (\$13) estimated by the U.S. Environmental Protection Agency in their analysis of the American Clean Energy and Security Act. These prices were multiplied by the quantity data to show the potential value of the CO₂ emissions.

It is unlikely that Congress will require 100 percent of the CO₂ emissions to have an offset credit. Rather a firm will be allowed some percentage of

allowances for CO₂ emissions. Using the best available information on the proposed legislation, value of complying with a 10 percent requirement (i.e., a firm would require carbon credits for 10 percent of their CO₂ emissions), a 25 percent requirement, and a 100 percent requirement (a highly unlikely scenario of requiring carbon neutrality) were calculated.

These values are shown in Table 1 for the three different price levels and three different compliance levels. The value of complying with the 10 percent requirement ranged from \$13 for an agricultural cooperative that had the average amount of 1,271 metric tons of CO₂ emissions at the current price of \$0.10 (1,271 multiplied by \$0.10 multiplied by the 10 percent compliance) to \$1,652 (1,271 multiplied by \$13 multiplied by the 10 percent compliance level). For the 100 percent compliance levels, these values were \$127 and \$16,523, respectively. For the largest cooperative in the study with 3,103 metric tons CO₂ emissions, the values at the 10 and 100 percent levels for the current \$0.10 price were \$31 and \$310, respectively. For the \$13 price, these values were \$4,034 and \$40,339, respectively.

Summary

These results correspond to a study with representative agricultural cooperatives in Kansas. Cooperatives from all geographical regions, of different sizes and providers of a wide variety of services were included. Based on the cap-and-trade bill passed by the House of Representatives, energy end-users like agricultural retailers such as these



Figure 1. Historical prices for CO₂ in metric tons for the January 2004 to June 2010 time period for the Chicago Climate Exchange.

Table 1. Value of CO₂ Emissions under Three Different Compliance Levels (10 percent, 25 percent, and 100 percent) and Three Different Prices (\$0.10, \$7.40, and \$13.00).

| | \$ 0.10 MT CO ₂ | | | \$ 7.40 MT CO ₂ | | | \$ 13.00 MT CO ₂ | | |
|--|----------------------------|------|-------|----------------------------|---------|----------|-----------------------------|----------|----------|
| | 10% | 25% | 100% | 10% | 25% | 100% | 10% | 25% | 100% |
| Average (1,271 MT CO ₂) | \$13 | \$32 | \$127 | \$941 | \$2,351 | \$9,405 | \$1,652 | \$4,131 | \$16,523 |
| Maximum (3,103 MT CO ₂) | \$31 | \$78 | \$310 | \$2,296 | \$5,741 | \$22,962 | \$4,034 | \$10,085 | \$40,339 |
| Minimum (104 MT CO ₂) | \$1 | \$3 | \$10 | \$77 | \$192 | \$770 | \$135 | \$338 | \$1,352 |

cooperatives would not be required to reduce or offset their emissions. However, emissions from producers and providers of several of the energy inputs employed by these retailers would be regulated if this legislation were enacted. Thus, it is very likely that the cost imposed on energy generators and suppliers would be passed on to the energy consumers such as farmers and ranchers in the form of higher input prices for fertilizer and energy. Energy generators and suppliers costs are likely to be greater than those incurred by the agricultural cooperatives.

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Michael Boland
Professor
Department of Agricultural Economics
Associate Director
Arthur Capper Cooperative Center

Elizabeth Canales
Doctoral Student
Kansas State University

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