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### **Climate Change Policy and Agriculture**

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Elevated atmospheric levels of greenhouse gases (GHG) such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and Nitrous Oxide (N<sub>2</sub>O) may have both positive and negative impacts on agricultural production. For example, field trials at the University of Illinois documented increased yields for crops grown under increased CO<sub>2</sub> levels and warmer temperatures. Follow-on trials, however, examined the yield suppressing effects of increased ozone concentrations. From a productivity perspective, agriculture will have to adapt to changing atmospheric conditions accompanying climate change.

To better assess policy alternatives, Congress directed the EPA to develop a mandatory reporting regime for GHG emissions. EPA regulations require covered entities to monitor emissions as of January 1, 2010, with annual reports starting in 2011. The rule, however, exempts agricultural operations except livestock systems that emit CH<sub>4</sub> and N<sub>2</sub>O (combined) greater than 25,000 metric tons of CO<sub>2</sub> eq/year. CO<sub>2</sub> eq is a measurement of the global warming potential (GWP) of a compound relative to CO<sub>2</sub>. For example, the GWP of CH<sub>4</sub> is 21. Therefore, 1 Kg of methane has a CO<sub>2</sub>eq value of 21. The GWP of N<sub>2</sub>O is 210. EPA estimates that only 107 livestock operations nation-wide reach the reporting threshold

On December 15<sup>th</sup>, the USDA reached an agreement with the dairy industry to reduce methane emissions 25 percent by 2020. To accomplish this goal, the agency will subsidize installation of anaerobic digesters that convert methane to electricity, reducing direct methane emissions and the demand for electricity generated from carbon-based fuels. This initiative is one of several recent developments at the federal level.

In June 2009, the U.S. House of Representatives passed H.R. 2454, the American Clean Energy and Security Act, which includes a mandatory GHG emission “cap and trade” program. Based on 2005 emissions, the “cap” requires a 17 percent GHG reduction by 2020 and 83 percent by 2050. Title V of the bill, however, explicitly exempts agricultural facilities from the emissions “cap.” More importantly, Title V delegated to USDA authority to develop rules for agricultural-based carbon offsets operations could sell to capped entities. Although the “cap” gradually will increase the costs of energy intensive agricultural inputs, a December 2009 USDA analysis concluded that agricultural offsets, combined with increases in commodity prices, would provide an annualized annuity value of \$22 billion to agriculture, with 30 percent of the gains accruing to the Corn Belt.

If Congress fails to pass a cap and trade bill, the EPA likely will take independent action to cap GHG emissions under its Clean Air Act (CAA) authority. On December 7<sup>th</sup>, the EPA announced its finding that GHGs endanger public health and welfare.

Although the immediate effect of this “endangerment finding” is to authorize improved fuel economy standards, the intricacies of the CAA result in a domino effect in which the agency must regulate other sources of GHG emissions. Accordingly, the EPA has proposed rules that would require permits and installation of emission controls on new and modified facilities emitting 25,000 metric tons of CO<sub>2</sub>eq/year. Although this would only capture the largest livestock operations, there is no explicit agricultural exemption (unlike under proposed cap and trade regimes) and EPA later could lower this threshold to include a substantial number of agricultural operations.

The ironic twist in this debate is that if agricultural groups successfully scuttle congressional initiatives, the alternative EPA-crafted CAA rules may impose direct GHG restrictions on agriculture (as opposed to the categorical exclusion contained in H.R. 2454) and less lucrative offset opportunities.