The Impacts of the American Clean Energy and Security Act of 2009 On U.S. Agriculture

Office of the Chief Economist
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Executive Summary

Our preliminary analysis of H.R. 2454, published in July[1], focused on the economic impacts of changes in energy prices associated with the cap imposed on domestic emissions. We have refined and expanded that analysis. The focus of this report is on how higher energy prices as well as the ability to generate and sell offsets resulting from a GHG emissions cap-and-trade system would affect the agriculture sector. In addition to national sector impacts, we present detailed regional impacts on both the effects of higher energy prices as well as the income potential from the sale of offsets. Our analysis finds that H.R. 2454 would benefit the agricultural sector. While higher energy prices are projected to increase farm expenses, when considered in conjunction with commodity price increases and revenues from offsets and biofuel production, the impact on net farm income is positive.

The economic impacts of climate change legislation on the farm sector are broad, complex, and will evolve slowly over the next decades. Impacts will be influenced by the timing and extent of changes in temperature and precipitation, the efficacy of actions to mitigate emissions and adapt to changes, the form of the actions taken within the United States and in other countries, and the extent to which mitigation within the farm sector can be compensated through greenhouse gas (GHG) offsets or other mechanisms. We have not been able to quantify all of these factors and their influence on the farm economy.

In particular, because of the time horizons considered in the medium and long term analyses there is much uncertainty surrounding the estimated effects. Factors such as yield productivity, development of energy-saving technologies and weather can all have major effects on supply, demand and price outcomes. Predictions far out into the future are inherently more uncertain than nearer term estimates. USDA typically only forecasts agricultural prices and incomes ten years into the future. As such, results – particularly for 2030 and beyond - should not be interpreted as precise estimates but rather as indications of the direction and magnitude of the expected effect.

The immediate implications are that higher energy prices will increase the prices paid for energy-related agriculture inputs and therefore increase agricultural production costs. Energy-related inputs include direct energy use, such as for diesel, natural gas, and electricity, and indirect use, such as for fertilizer. Our findings suggest that under the energy price scenario estimated by the Environmental Protection Agency (EPA), price and income effects due to higher production costs will be relatively small, particularly over the short run (2012-18). Impacts on production costs are also mitigated by provisions in H.R. 2454 that would provide allowance rebates to "trade-vulnerable" industries, including fertilizers. When production cost impacts considered in conjunction with likely commodity price

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[1] U.S. Department of Agriculture, Office of the Chief Economist and Economic Research Service. "A Preliminary Analysis of the Effects of H.R. 2454 on U.S. Agriculture" July 22, 2009. Available at http://www.usda.gov/oce/newsroom/archives/releases/2009files/HR2454.pdf We acknowledge the contribution of the Economic Research Service in providing data and analysis used in this paper.

increases and possible revenues from offsets and increased biofuel production, the impact on net farm income is positive.

The ability to generate and sell offsets provides an additional source of farm income which can compensate for any loss in income due to higher energy costs. Gross income associated with offsets could be as high as $30 billion by 2050 (Table ES-1). In addition to offset revenues, providing offsets through afforestation will also take land out of agricultural production. As a result, the impact of less land in agricultural production leads to higher overall returns to agricultural producers. The effect of higher prices received outweighs the effect of less production and, on average, net returns to agricultural producers are about 12 percent higher, with an annuity value in excess of $20 billion if we count change in producer surplus through 2080. This excludes the revenue earned from afforestation offsets.

Consumers will likely feel the effect of higher commodity prices through increases in the prices paid for food. The overall impact on the Food CPI is estimated to be an increase of about 0.1 to 0.2 percentage points above the expected historical trend in the Food CPI in 2015 and 1.2 to 2.1 percentage points above the expected historical trend in the Food CPI in 2050 with the years in between showing steady increases in the index.

While we are confident that the level of offsets will be significant, it is possible that the level and mix of offsets especially with respect to afforestation will differ as a result of changes in model assumptions. This suggests continued work to refine model assumptions. For example, it is important to recognize that our analysis does not account for all potential offset categories. The exclusion of other sources in the modeling does not imply that those sources would not be eligible to receive offsets (e.g. management of peatland or wetland). Similarly, H.R. 2454 requires the Secretary to develop methodologies for domestic agricultural and forestry offsets which establish activity baselines, a standardized approach for determining additionality and leakage, and methods for monitoring and accounting for uncertainty. To the extent that the methods developed are different than those assumed in the models, both the amount and mix of offset activities can be different than our estimates. In addition, we assume the structure of government programs remains fixed over the entire time period. For example, we assume the Conservation Reserve Program is maintained at 32 million acres, the structure of current farm programs remains unchanged, and there are no changes to current trade agreements. Again, changes to these or other policy variables can affect both the level and distribution of offsets by changing agricultural market conditions.

Table ES 1: Effects of H.R. 2454 on Net Farm Income (billion 2005$)

	2015	2020	2025	2030	2035	2040	2045	2050
Gross income associated with offsets	$0.8	$2.4	$3.5	$5.2	$11.6	$18.1	$23.7	$29.7
Change in producer surplus 1/	$1.4	$2.0	$2.8	$3.9	$5.5	$7.7	$10.8	$15.1

From USDA analysis based on FASOM simulations provided by EPA and other data provided to USDA by Bruce McCarl at Texas A&M University. FASOM estimates are based on 5-year averages (e.g., 2015 is reflects average over 2015-19). 1/ Excludes revenues from offsets.