

# The Value of a Carbon Offset Market for Agriculture

The House of Representatives recently passed the Waxman-Markey (H.R. 2454) legislation, a pending bill that would create a cap and trade system and new markets for agriculture. The Waxman-Markey bill would cap greenhouse gas emissions from industry and allow offsets from agriculture to be purchased (cap and trade). Under a cap and trade market, agriculture could generate additional revenue by selling emission offset credits to industries required to reduce their emission levels even though, as an uncapped sector, agriculture will not be regulated. These credits would be created by sequestering and reducing carbon or other GHG emissions.

The current version of the legislation with the Peterson Amendment includes key changes in offset provisions from previously proposed drafts. Recently updated analysis from EPA and others indicates the Waxman-Markey bill could **create a domestic offset market valued at \$2.7 billion to \$3.4 billion or more annually within five years of the legislation's implementation.**<sup>1</sup>

## Agriculture's Role

In the Waxman-Markey bill, capped entities could purchase offsets to meet compliance obligations; in total, domestic and international offsets would be allowed up to a total of 2 billion metric tons of greenhouse gas emissions annually.<sup>2</sup> This creates opportunities for farmers to participate in a new market and generate increased revenue as the legislation looks to the agricultural community to serve as offset providers. Currently, the bill allows for emissions to be offset by:<sup>3</sup>

- Soil Carbon Sequestration
- Animal Waste Methane Capture
- Nitrous Oxide Reductions from Fertilizer Application
- Afforestation Carbon Sequestration
- Forest Management Carbon Sequestration

The offset program, set to be overseen by the U.S. Department of Agriculture, allows for carbon sequestering methods to be implemented with conventional farming techniques so that the agricultural community can provide carbon offsets in a cost-effective manner while acquiring new revenue. So it is not a matter of deciding to grow carbon OR crops – it can be a matter of growing both “crops” at once on the same land. Such methods of farm integrated carbon sequestration include:<sup>4</sup>

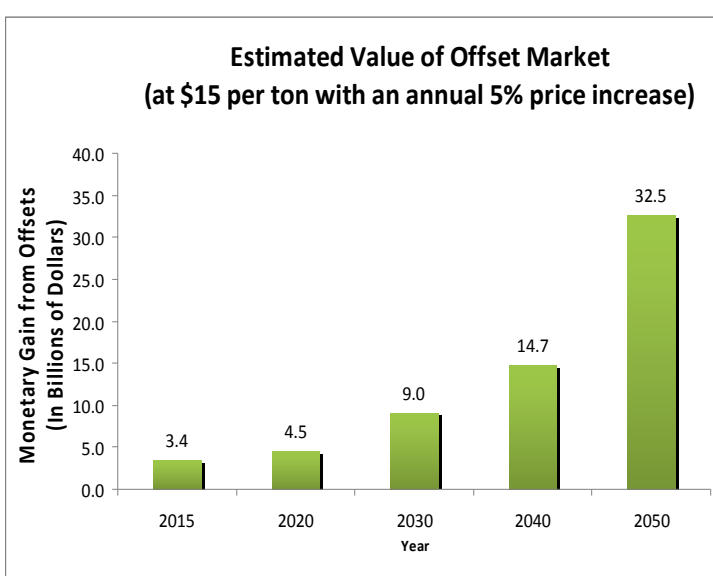
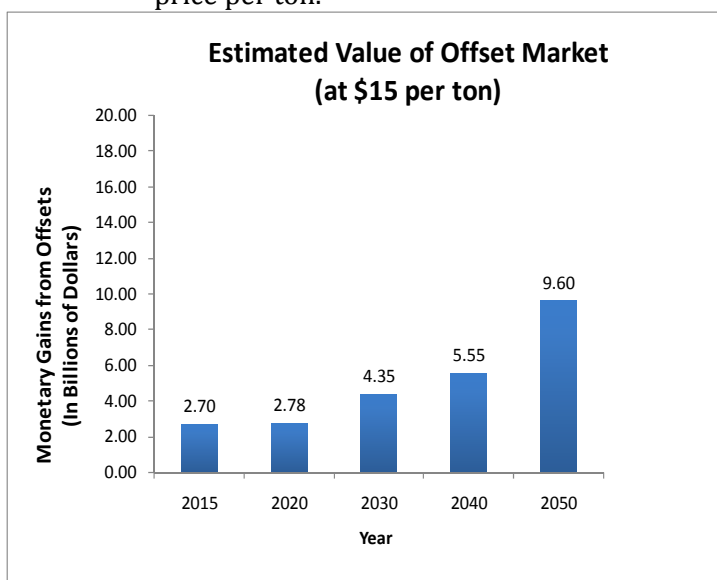
- Reduced Tillage/No Till Farming
- Winter Cover Cropping and Continuous Cropping
- Improved Nitrogen Fertilizer Management
- Improved Manure Management

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As technology progresses and the nation also looks to pass the Renewable Fuel Standard in the upcoming months, farmers could further provide offsets and subsequently increase profits by implementing other practices to decrease carbon emissions, such as by growing biofuel crops. Modeling indicates a strong component for biofuel production in a cap and trade system.<sup>5</sup> In fact, bioenergy and biofuel production could have a more significant net benefit to crop producers by significantly increasing commodity prices overall.<sup>6</sup>

### Economic Implications

Under a carbon market, it is estimated that carbon offsets could be valued at \$15-\$30 per metric ton with prices increasing at 5% a year depending on market demand.<sup>7</sup> **Projected revenue from the total offset program could generate at least \$2.7 billion annually within the next five years with earnings increasing into the future.**<sup>8</sup> The graphs below show projected revenue generated by the domestic offset market depending on the carbon price per ton.<sup>9</sup>



If offset providers earned market carbon prices starting at \$15 per metric ton of carbon dioxide sequestered with prices rising at 5% annually, analysis indicates that **the domestic offset market could grow to \$4.5 billion or higher per year by 2020.**<sup>10</sup>

### Costs to the Sector

Projections on increased costs to agriculture, and especially the level of cost projections, have resulted in a highly charged debate. Cost projection estimates for agriculture vary widely. For example, estimates based on Missouri farms, championed by Senator Kit Bond (R-MO), Farm Bureau and other climate policy opponents, predict an increase in production costs of 4% to 10%, depending on the commodity.<sup>11</sup> This cost scenario does not include benefits from a) offset markets; b) bioenergy production; c) rising commodity prices as indicated in bill modeling.

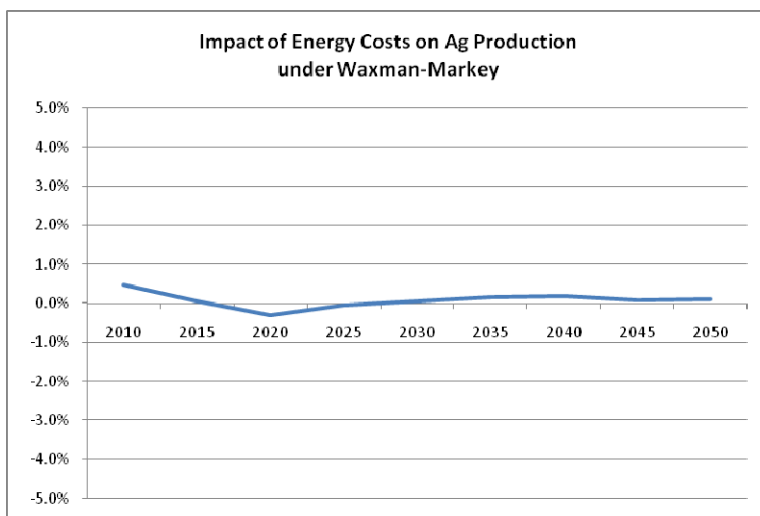
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However, another analysis by Iowa State University economist Bruce Babcock indicates “relatively small” production costs of roughly \$4.52 per acre for corn and soy farmers in Iowa, on the order of 1-2%.<sup>12</sup> This includes costs from diesel, fertilizer and propane and assumes a robust carbon price of \$20 per ton of carbon dioxide.<sup>13</sup> To put this potential cost increase into perspective, the variable cost of producing corn and soybeans in Iowa in 2009 is somewhere around \$300 per acre.<sup>14</sup> Babcock also cites that the amount of soil carbon that can be increased from adoption of no-till farming is typically on the order of one ton of CO<sub>2</sub> per hectare, or about 0.4 tons per acre annually.<sup>15</sup> At a \$20-per-ton carbon price, this amounts to \$8.00 per acre.

In the United States, soil carbon sequestration rates can be as much as 1.2 MMT per acre, though 0.6 MMT is more common.<sup>16</sup> At a carbon price of \$20-per-ton, some farmers sequestering between 0.6 MMT and 1.2 MMT an acre could anticipate payments of between \$12 to \$24 an acre for carbon sequestration alone. Additional benefits could come from other practices such as precision agriculture, which limits nitrous oxide emissions or fuel usage.

*Production Impact*

Modeling shown in the chart below from the most recent EPA data on the Waxman-Markey legislation indicates that agricultural production is not projected to increase or decrease more than 1% under cap and trade.<sup>17</sup>



*Costs and Revenue*

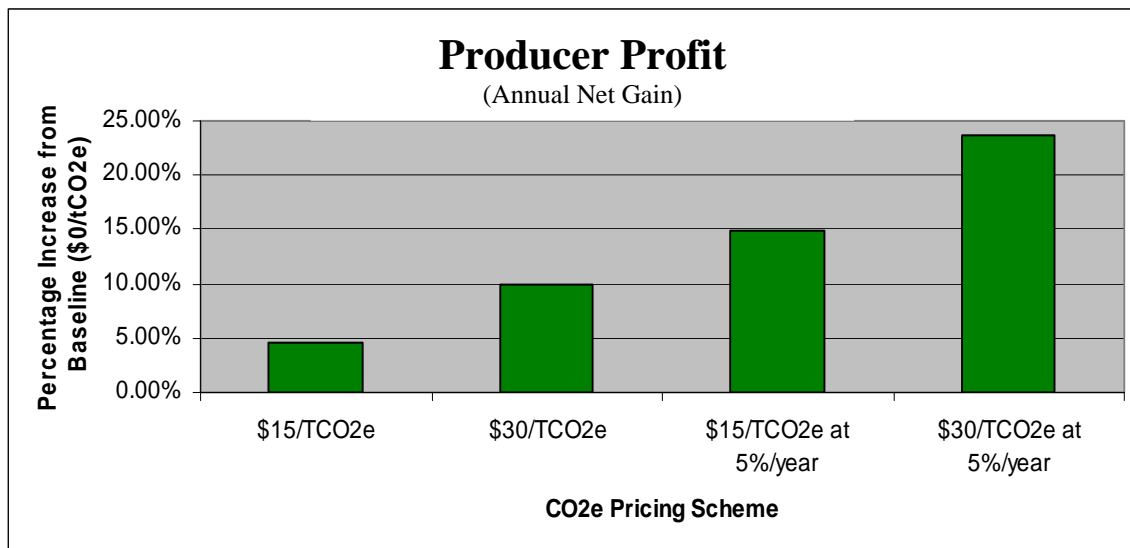
The models examining the specifics of the offset market in the latest version of Waxman-Markey are still being developed, and new models are expected soon from USDA. However, some analysts predict overall added revenue for agriculture under a cap and trade system.<sup>18</sup>



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Depending on the carbon pricing scheme, farmers could increase their net profits by up to 24% under a cap and trade system (*after* taking costs into account).<sup>19</sup> Additional income under cap and trade is projected to arise from a number of sources including revenue from the production of low-carbon biofuels and an increase in commodity prices caused by changes in management practices.<sup>20</sup>

The graph below from Bruce McCarl and Justin Baker of the Climate Change Policy Partnership depicts the percentage of net gain profits expected to be incurred annually by the agricultural community from a cap and trade program.<sup>21</sup> This particular model includes the Renewable Fuel Standard, inferring that offsets and commodity price effects, rather than biofuel effects, play a large role in profits.



Analysis indicates the increase in farming income from offsets, biofuels and commodity prices resulting from a cap and trade system more than offsets any potential increase in the price of fuel, fertilizer, or other inputs for the agricultural sector.

### Summary

The agricultural community:

- Could tap into revenue from offset market earnings estimated to reach at least \$2.7 billion annually by 2015.<sup>22</sup>
- Could see an increase in costs of production of roughly 1% to 2%.<sup>23</sup>
- Could mitigate the threats from climate change and avoid the costs to farmers associated with destructive weather events.

## AGRICULTURAL CARBON MARKET WORKING GROUP

Agriculture addressing climate markets

Working together to develop policies that are good for agriculture, the environment and rural America.

### **About Us**

The Agricultural Carbon Market Working Group is comprised of national farm leaders from all major commodities, the biofuels industry, and other key agricultural stakeholders (complete list on [www.agcarbonmarkets.com](http://www.agcarbonmarkets.com)). Together, we have spent the last four years studying and addressing potential carbon offset markets for agriculture that could result from national policy. We have also worked with agribusiness and agricultural organizations to begin addressing key policy strategies that promote climate markets for agriculture.

We are currently working cooperatively with other entities also interested in developing carbon markets for agriculture such as the nine-University Consortium for Agricultural Soil Mitigation of Greenhouse Gases (CASMGs); the Dole Daschle 21st Century Farm Policy Initiative. We also partner with Non-governmental organizations that support agricultural offsets such as Environmental Defense Fund, The Bipartisan Policy Center and work cooperatively with the Nicholas Institute.



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