Climate Facts

Opportunities for Agriculture:
How Energy and Climate Legislation Will Help Farmers Cut Energy Costs and Raise Farm Income

For more information, please contact

Sasha Lyutse at (212) 727-4603 or

Nathanael Greene at (212) 727-4482.

Clean energy and climate legislation under consideration by Congress will jumpstart the clean energy economy and set the first-ever national limits on the pollution that is driving global warming. The American Clean Energy and Security Act (ACES, H.R. 2454) passed by the House, and bills coming up for a vote in the Senate, provide significant benefits for American farmers, including incentives to cut costs and raise new income by increasing energy efficiency and selling renewable energy. In addition, farmers will earn new income by selling high-quality emissions offsets.

American farmers and ranchers are in a unique position to reap gains from the transition to a low-carbon economy—gains that will outweigh predicted increases in fossil energy costs. In short, clean energy and climate legislation will help farmers and ranchers provide the food we need while creating new jobs and contributing to a more secure and sustainable clean energy economy.

Clean energy and Climate Legislation Will Help, Not Harm, American Farmers

Farmers need energy to grow crops and raise livestock, and to transport products to consumers. Farmers have been hurt by recent spikes in diesel and natural gas prices, and by jumps in the costs of inputs like fertilizer. As a result, there are serious concerns across the agricultural sector about the impacts of clean energy and climate legislation on production costs. But recent analyses of the House-passed ACES bill show that increases in fossil energy costs will be small compared to the volatile energy prices that farmers have experienced in recent years.[1]

In addition, there are three key factors affecting energy prices that will help farmers handle a small increase in both the short and the

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long term. First, farmers that take advantage of energy and climate bill incentives can quickly see big cost savings from even small improvements in energy efficiency. Second, farmers can take advantage of the legislation's renewable energy incentives to reduce dependence on fossil fuels and their volatile prices. Third, the legislation will help stop speculation in energy markets, which will help stabilize fossil fuel prices.

Increased Energy Efficiency Will Save Farmers Money

Energy and climate legislation will help farmers increase their energy efficiency, reducing their dependence on foreign oil and other fossil fuels. Energy expenditures currently represent 6 percent of U.S. farm production costs, costing the agriculture sector more than $10 billion per year.[3] On-farm energy efficiency measures could generate savings upwards of $1 billion annually. These measures include technology changes such as more efficient farm equipment and farming practice changes such as no-till agriculture (which reduces the need for energy-intensive plowing).[4] To help with upfront implementation costs, the House-passed ACES bill offers farmers federal tax credits for energy efficiency upgrades.

Harvesting Renewable Energy for Renewable Revenues on the Farm

Energy and climate legislation will speed deployment of renewable energy sources, making alternatives like solar, biogas, wind, and biomass competitive with fossil fuels. Farmers are in a unique position to benefit as these technologies reach commercial scale.

Solar Technologies

Both livestock and crop farmers can avoid higher electricity costs by harnessing energy readily available on their farms. Installing solar panels on surfaces like the roofs of homes and barns could help farmers lock in present-day electricity rates into the future, thus avoiding any price increases that result from the cap.[5] If a quarter of U.S. farmers took advantage of this option in 2020, the agricultural sector could save roughly $80 million in annual electricity costs.

Biogas-to-Energy

Livestock farmers can meet on-farm needs for natural gas and electricity with biogas recaptured from animal waste—at the same time earning "offset" credits from cutting harmful methane

Building the Clean Energy Economy and Curbing Global Warming

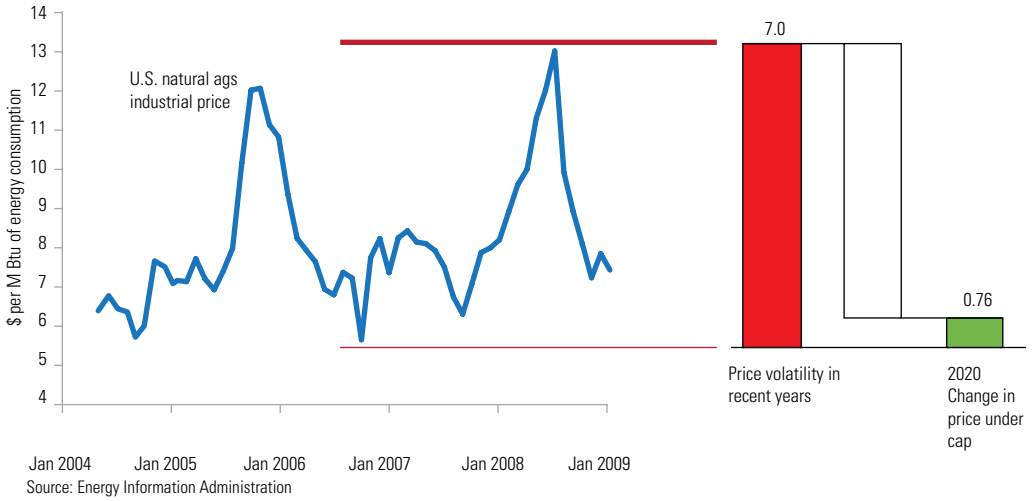
The American Clean Energy and Security Act passed by the House in June includes strong standards and incentives to improve energy efficiency, increase renewable energy, and reduce global warming emissions from fossil fuels. The bill calls for:

Renewable energy standards:
- 20 percent of electricity to come from renewable sources and efficiency improvements by 2020

Incentives for renewable energy technologies and efficiency measures:
- $90 billion to energy efficiency and renewable energy technologies
- $60 billion to carbon-capture-and-sequestration technology

Strong targets for reducing global warming pollution:
- 17 percent reduction below 2005 levels by 2020
- 42 percent reduction below 2005 levels by 2030
- 83 percent reduction below 2005 levels by 2050

Modest Changes in Energy Prices Expected Under ACES Cap



Source: Energy Information Administration

The cost of the House-passed ACES bill will be only a fraction of the big energy cost swings that farmers have seen in recent years. Recent spikes in natural gas prices have caused corresponding jumps in the cost of inputs like fertilizer. According to a March 2009 *Amber Waves* report, the price of natural gas rose more than 65 percent between June 2007 and June 2008. By comparison, the 2020 price of natural gas is expected to rise only $0.76 per million Btu (2007 dollars) under ACES, or less than 10 percent.[2]

emissions. The U.S. Environmental Protection Agency (EPA) estimates that biogas recovery systems on large livestock farms could generate up to 6 million megawatt-hours (MWh) of electricity per year. If just half this potential is realized, biogas would offset roughly 7 percent of the agricultural sector's electricity consumption in 2020 with a resulting cost savings of approximately $190 million.[6] The sale of offsets could add another $60 million of income in 2020.[7] And farmers can make even more money selling surplus electricity into the grid.

Harnessing the Power of the Wind

With energy and climate legislation expanding markets for renewable electricity, farmers can make money leasing land for wind turbines. Wind power was the dominant source of renewable energy capacity added in the U.S last year and is the fastest growing new source of electricity in America. New wind projects completed in 2008 accounted for approximately 46 percent of the total new electricity capacity added nationally, including both renewables and fossil fuels.[8] Leasing small plots of land for wind turbines offers farmers and other landowners a lucrative new source of income at no additional cost and with no sacrifice of crop acreage. Based on an average land lease price of $3,500 per MW of installed wind capacity, these land leases could generate more than $500 million in revenue in 2020.[9]

Converting Biomass to Energy

A major source of new farm revenue will come from the sale of crop wastes as bioenergy feedstocks. Based on U.S. Department of Agriculture (USDA) estimates, 100 million dry tons of corn stover and other agricultural residues could be harvested sustainably on U.S. farms in the year 2020.[10] At a market price of $50 per dry ton, and with safeguards like no-till farming in place to manage the risk of increased soil erosion from crop waste removal, farmers could earn roughly $4 billion in annual profits, once cost savings from reduced fuel and water use are factored in.[11]

Case Study: Biomass-to-Fertilizer

Innovations in biomass gasification technologies will allow for a stable, low-cost and domestic source of nitrogen fertilizer by using renewable agricultural residues as a substitute for natural gas in fertilizer production.

SynGest Inc. recently announced plans to build the world's first commercial scale biomass-to-fertilizer facility in Menlo, Iowa. The facility will use an oxy-gasification process to convert agricultural crop waste such as corn stalks and cobs into anhydrous ammonia—a form of nitrogen fertilizer—and advanced biofuels. The SynGest plant will process 130,000 tons of locally supplied corn cobs annually to manufacture 50,000 tons of bio-ammonia, enough to fertilize 500,000 acres of nearby corn farmland.[14] In addition to ammonia, the same gasification process that produces the syngas can be combined with a variety of downstream processes to produce several different fuel products.

Stabilizing Prices by Controlling Speculation in Energy Markets

Speculation in the energy and agricultural commodity markets has lead to significant price volatility in recent years. The House-passed ACES bill would close many of the regulatory loopholes used by speculators to manipulate energy prices, reducing dramatic price fluctuations. Under the bill, the Commodity Futures Trading Commission would set position limits, reporting requirements, and comprehensive market oversight provisions for oil, natural gas, coal, and electricity markets, as well as the market for carbon offsets and allowances.

The Carbon Market Will Create New Income Opportunities for Farmers

Energy and climate legislation will reward farmers for setting aside marginal lands to sequester carbon in soils and trees. Under a carbon cap, farmers will be able to tap an important new source of income through the sale of carbon offset credits, with environmental safeguards in place to ensure offset credits maintain a high value. In 2020, at estimated CO_2 prices of $20 to $25 per ton, the EPA estimates that 17 to 21 million tons of offsets can be available from projects in the agricultural sector, with a total market value of $344 to 530 million.[15] Over time, interest will grow in funding projects to explore additional ways to enhance carbon sequestration on U.S. lands. Once a track record of success is established, these activities could also qualify as tradable offsets.

New States Emerge as Leaders in Wind Power

In 2008, Iowa surpassed California in wind power generating capacity, with 2,790 MW installed. The top five states in terms of capacity installed are now:

1. Texas, with 7,116 MW
2. Iowa, with 2,790 MW
3. California, with 2,517 MW
4. Minnesota, with 1,752 MW
5. Washington, with 1,375 MW

Source: AWEA

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Clean Energy and Climate Legislation Will Provide New Opportunities for Agriculture

The U.S. agricultural community is well positioned to benefit from passage of clean energy and climate legislation. Farmers can protect themselves from cost increases through improved on-farm energy management and efficiency and develop new revenue streams through expanded markets for renewable energy and carbon offsets. This will help our farmers continue to provide the food we all depend on, while also creating jobs, improving our national energy security, and curbing global warming.

Case Study: Agriculture and Carbon Capture and Storage (CCS)

In addition to wind and solar, there are other important clean energy technologies on the horizon to generate valuable emissions reductions and new revenue streams for the agricultural sector.

CCS is most often discussed as a solution for power plant emissions. But it is also an economical option for important agricultural industries. Facilities that make ammonia-based fertilizer and ethanol each produce nearly pure streams of CO_2 emissions that can be readily captured. For every ton of fertilizer or ethanol produced, approximately one ton of CO_2 is emitted.[12] Today, some plants capture these emissions for use in carbonated beverages and other industrial applications.

Under the House-passed ACES bill, there are significant incentives for capturing and storing carbon emissions from fertilizer and ethanol producers. In many areas, the captured CO_2 can be piped and sold for enhanced oil recovery prior to being sequestered in depleted oil fields. For example, the Koch Industries' fertilizer plant in Enid, Oklahoma already captures more than 600,000 tons of CO_2 per year, which are sold for enhanced oil recovery. The company has proposed doing the same at their Coffeyville, Kansas fertilizer manufacturing plant.[13] In addition, long-term carbon storage in oil fields and other geologic formations will provide additional land lease revenues to rural landowners, much the same way farmers lease land for the construction of wind turbines today.

[1] See EPA's analysis at http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf and the Congressional Budget Office's analysis at http://www.cbo.gov/ftpdocs/102xx/doc10262/hr2454.pdf.

[2] Based on NEMS modeling of ACES impacts on energy consumption and prices. Prices are net of allowance allocations to consumers via local distribution companies (LDC's).

[3] Eight Reasons for Farmers to Support Global Warming Action, Center for American Progress, Jake Caldwell, Alexandra Kougentakis, June 2009.

[4] Potential Energy Efficiency Savings in the Agriculture Sector, Elizabeth Brown and R. Neal Elliot; The American Council for an Energy-Efficient Economy, April, 2005.

[5] Based on agreements offered by SunEdison. For more information, see: http://www.sunedison.com/

[6] USEPA (http://www.epa.gov/agstar/) and EIA 2009 Annual Energy Outlook.

[7] USEPA, 2009 and EIA March, 2009 Annual Energy Outlook reference case.

[8] See Renewable Energy Industry Note, Prometheus Institute for Sustainable Development, March 25, 2009.

[9] Projections based on AWEA 20% Windpower by 2030 scenario. See http://www.20percentwind.org.

[10] Based on USDA and DOE. 2005.

[11] Savings from no-till based on USDA and University of Nebraska Institute of Agriculture and Natural Resources estimates of reduced diesel fuel and water use when changing from conventional tillage to no-till. No-till implementation cost estimates based on and Corn Stover For Ethanol Production: Potential and Pitfalls, Liz Marshall, Zachary Sugg; World Resources Institute, January, 2009.

[12] USEPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2007.

[13] Storing CO_2 with Enhanced Oil Recovery, Advanced Resources International, February 2008.

[14] For more information see: http://www.syngest.com/index.html

[15] USEPA, 2009.