

# Manure to Money??? Carbon and Renewable Energy Credits

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## Introduction

When earth life was created, a balance between atmospheric oxygen (O<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) was formed. Animals breathe air and extract oxygen for their body cells to properly function, returning carbon dioxide into the atmosphere as waste. Plants uptake carbon dioxide and through the process of photosynthesis produce their cellular energy source, glucose, and resulting waste product – oxygen. This natural system worked beautifully until the industrial revolution started putting more carbon compounds into the air than the ever-lowering plant population had a chance to remove.

Now news reports tell us global warming is melting glaciers and polar ice caps and, if left unchecked, will eventually put most of Florida under water. One contributing cause of global warming is the increasing amounts of industrial greenhouse gas emissions, predominately carbon dioxide and methane (CH<sub>4</sub>), but including nitrous oxide, sulfur hexafluoride, hydrofluorocarbons and perfluorocarbons (Davidson, 2008).

Carbon dioxide is emitted by our lungs when exhaling, vehicles when driven or flown, and any fossil fuel (including coal) powered factory or electricity generator when the fuel is converted to energy. Methane, which is belched by cattle and bubbled up from lagoon bottoms, is considered 21% more harmful than carbon dioxide in its warming effect (Davidson, 2008).

To counteract global warming, green power (electricity or fuels supplied from renewable energy sources, such as wind, solar, geothermal, hydropower and various forms of biomass) has become the popular answer. In the world of business, popular answers still must be economically feasible or forced. Recognizing this, the United Nations began talks which were agreed upon in 1997 and entered into force in February 2005, which became known as the Kyoto (Japan) Protocol. It is an amendment to the United Nations Framework Convention on Climate Change with the objective of achieving stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (human caused) interference with the climate system (Anonymous, 2008a).

As of November 2007, 175 parties had ratified the Kyoto Protocol. The United States is not among them. The thirty-six developed countries (plus the European Union as a party in its own right) who signed are required to reduce greenhouse gas emissions to the levels specified for each of them in the treaty. (Each developed

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country has its own specified cap.) Between 2008 and 2012, developed countries have to reduce greenhouse gas emissions by a collective average of 5% below their 1990 levels (for the European Union countries, this corresponds to some 15% below their expected greenhouse emissions in 2008). One hundred thirty-seven developing countries have ratified the protocol, including Brazil, China and India, but have no obligation beyond monitoring and reporting emissions (Anonymous, 2008a).

One of the “flexible mechanisms” which allows developed countries under the Protocol to meet their greenhouse gas emission reductions is by purchase (trade) of greenhouse emission reductions from elsewhere (usually developing countries who are encouraged to build “green industries”)( Anonymous, 2007). Kyoto established a Bonn, Germany, based Clean Development Mechanism Executive Board to assess and approve projects prior to awarding Certified Emission Reductions (CER). A Certified Emission Reduction is equal to a ton of carbon dioxide removed from the air. Certified Emission Reductions can be purchased from financial exchanges, from certified projects which reduce emissions, or from other developed countries with excess reductions (Anonymous, 2007).

## **Carbon Credits**

Although the United States did not enter into the Kyoto Protocol, it has not stopped entrepreneurs from starting up a voluntary carbon credit system. Like the UN Certified Emission Reductions, any carbon credit or carbon offset is equal to a ton of carbon dioxide removed from the air. Since no “authorized” certification method has been federally approved, it has been difficult verify carbon credits to date. In late February the United States released guidelines advising companies and individuals to only purchase Certified Emission Reductions to avoid buying worthless credits (Harvey, 2008).

In 2007, the United States carbon credit market more than doubled to between \$150 million and \$200 million, according to research firm Ecosystem Marketplace. Comparatively, in Europe, under Kyoto Protocol, the Certified Emission Reductions market hit \$10 billion last year (Davidson, 2008).

Even now, with voluntary conditions in the United States, individuals and companies are looking for verifiable carbon credits or offsets. Dairy producers with methane-producing, covered lagoons or the ability to convert their manure into methane or other biofuels in an anaerobic digester, can then either utilize the methane to generate electricity, heat water, or just burn it off to convert the methane into more environmentally friendly carbon dioxide. All of these things reduce the amount of greenhouse gas emissions that would otherwise be going into the atmosphere and are “certifiable emission reductions.”

An example dairy from Florida, of 3500 cows, which hypothetically converted its manure to methane to electricity, had modeled annual carbon credit revenue of between \$56,000 in 2009, to \$70,000 in 2011, to \$84,000 in 2014, to \$98,000 in 2017, by

Terrapass, a private company which sells carbon credits on-line to individuals who wish to balance their carbon impact. Interesting, they would not calculate carbon credits for a herd of 700 because of the high cost of getting the credits validated by a third party (Freed, 2008).

There is anticipation that Congress will approve a federal cap on greenhouse gas emissions, which could potentially expand the carbon credit market incredibly. Hedge funds and investment banks are starting to trade carbon credits like stocks and bonds already, betting their value could soar if greenhouse gas caps are imposed (Davidson, 2008).

### **Renewable Energy Credits (RECs) (also Known as Green Tags, Renewable Energy Certificates, or Tradable Renewable Certificates)**

A Renewable Energy Credit is a tradable environmental commodity that represents proof that 1 megawatt-hour (MWh) of electricity was generated from an eligible renewable energy resource. These credits can be sold and traded (in 2006 from \$5 to \$90 per MWh, median about \$20) (Anonymous, 2007), but not “double-dipped” as a carbon credit too ((Anonymous, 2008b).

While Carbon Credits promote low carbon technologies, Renewable Energy Credits can incentivize carbon-neutral renewable energy by providing a production subsidy to electricity generated from renewable sources : solar, wind, geothermal, low impact hydropower (small-run-of-the-river facilities, not dams), biomass, biodiesel, and fuel cells powered only by hydrogen produced by one of the previous methods) (Anonymous, 2008b).

In states which have a Renewable Energy Credits program (Florida does not), a green energy provider (a wind farm or dairy with methane-propelled electrical generator, for instance) is credited with one REC for every 1,000 kWh or 1 MWh of electricity it produces. A certifying agency gives each REC a unique identification number to ensure it does not become double-counted. The green energy is then fed into the electrical grid (by mandate) and the accompanying REC can then be sold on the open market (Anonymous, 2008b).

Florida and Georgia dairy producers, who convert methane into electricity, may have the option of using that electricity on the farm or selling it to the electrical grid as “green energy.” Florida, Georgia and federal future legislation may give dairy green-electricity producers more options. It is not outside the realm of possibility that both non-profit and for-profit organizations will help fund new renewable energy credit projects.

### **Bottom Line**

Dairy producers should seriously consider their options, potentially band together to form an aggregate group to sell collective carbon credits, and pay attention to

legislation (particularly state Renewable Portfolio Standards, national carbon capping and the next round of Kyoto talks which will determine what happens after 2012, when the current round comes to an end). Stay informed for your financial future well-being. Sale of Carbon Credits or Renewable Energy Credits could potentially add significantly to a dairy's bottom line.

## **References**

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