



## MICHIGAN FORESTS AND FARMS: TAPPING AND MARKETING OUR LAND RESOURCES FOR CARBON SEQUESTRATION

By Melissa B. Papke\*

### Introduction

Currently, the United States is the largest gross and per capita global emitter of greenhouse gases (GHG), emitting more than 20% of the world's GHG, while comprising less than 5% of its population.<sup>1</sup> An evaluation of concentrations within the U.S. reveals that the Midwest would be the seventh largest emitter worldwide if it were its own country.<sup>2</sup> And, Michigan alone ranks ninth in the nation, emitting almost one-half million pounds of carbon dioxide per year.<sup>3</sup>

These types of statistics have fueled prolonged debate regarding global warming and varying proposals as to the most effective way for the U.S. and individual states to meaningfully reduce their GHG emissions. As a result, a variety of efforts are underway internationally, nationally and at State or regional levels including research, economic incentives, energy efficiency standards, and

both voluntary and mandatory emissions reductions programs. This article will focus on the last category, voluntary and mandatory cap and trade programs, with particular emphasis on the role of carbon offsets in those systems and current opportunities for landowners to create offsets that will simultaneously provide environmental benefits and generate income.

Because understanding the nature of an offset, the markets for offsets, and the current or future value of offsets requires a working knowledge of cap and trade mechanics and the programs that exist or are emerging, a significant part of this article offers practical knowledge and background in those areas. This practical knowledge should enable practitioners to identify those clients of theirs that may be good candidates for generating offsets (or aggregating offsets on behalf of others), and to acquire a baseline understanding of the procedure for creating, registering, and selling offsets sufficient to conduct preliminary discussions. Identifying untapped value for our clients brings its own rewards, but clients may also require assistance in negotiating conservation easements, sustainable management plans, contracts with aggregators or private carbon investment firms, and other transactional documents. Accordingly, our understanding of this topic, as lawyers, should enable us to help clients both evaluate their ability to participate in the carbon market and implement a strategy to do so.

1. United Nations Development Programme, *Human Development Report 2007/2008* (New York: Palgrave Macmillan, 2007) p 40-43 (available online at [http://hdr.undp.org/en/media/HDR\\_20072008\\_EN\\_Complete.pdf](http://hdr.undp.org/en/media/HDR_20072008_EN_Complete.pdf)); Larsen, Damassa & Levison, *Charting the Midwest: An Inventory and Analysis of Greenhouse Gas Emissions in America's Heartland* (World Resources Institute, October 2007), p 7-8, relying upon WRI-Climate Analysis Indicator Tool (CAIT) (2006), based on 2000 world data, the latest year for which an international six-gas inventory is available (available online at <http://pdf.wri.org/charting-the-midwest.pdf>).
2. World Resources Institute, *WRI Fact Sheet-Midwest States Show Leadership in Addressing Climate Change* (November 2008) (available online at [http://pdf.wri.org/factsheets/factsheet\\_midwest\\_states.pdf](http://pdf.wri.org/factsheets/factsheet_midwest_states.pdf)) relying on WRI-CAIT-US (2007), based on 2003 data. For purposes of this article, the Midwest refers to Iowa, Illinois, Kansas, Michigan, Minnesota, and Wisconsin.
3. Larsen, Damassa & Levison, *Charting the Midwest*, *supra* note 1, p XI, 6-8.

### The Basics of Cap and Trade

In a cap-and-trade program, a government or agency designates certain categories of emissions that will be regulated and sets a target reduction to be achieved over a given period of time. To realize the target, emissions

\* Melissa B. Papke, a partner at the Grand Rapids office of Varnum, received her undergraduate degree from Dartmouth College and her J.D. from University of Michigan Law School. She is a Fellow of the American College of Mortgage Attorneys and currently serves as Co-Chair of the Environmental and Energy Law Committee of the Real Property Law Section of the State Bar of Michigan.

are “capped” for the stated period and entities that are subject to regulation must not collectively emit more than the cap. After the cap has been set and covered entities specified, tradable rights to emit, called allowances, are distributed or auctioned to the covered entities. In the case of the GHG cap and trades, generally, each allowance authorizes the release of one metric ton of carbon dioxide equivalent (CO<sub>2</sub>e).

Most mandatory cap and trade programs establish phased compliance periods and, at the end of each compliance period, regulated entities must surrender allowances equal to their volume of emissions for that period, or face significant penalties. Against this backdrop, there are invariably some who are better equipped than others to reduce their emissions at a relatively inexpensive cost. As a result, allowance trading occurs, whereby entities that have more than they need sell their surplus allowances to firms that face higher reduction costs, and therefore need more allowances.

### **The Beginnings of Carbon Cap and Trade – the Kyoto Protocol**

The foremost carbon cap and trade system emerged from the 1992 United Nations Framework Convention on Climate Change, an international treaty to counter climate change that was updated in 1997 to add the Kyoto Protocol (Kyoto). The primary objective of Kyoto was a mandatory decrease in GHG emissions, including reduction of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), perfluorocarbons (PFC), and hydrofluorocarbons (HFC), with 37 of its signatory countries bound to reduce their 1990 baseline emissions by an average of 5% between 2008 and 2012.<sup>4</sup> Kyoto became effective in 2005, with 141 ratifying countries<sup>5</sup> that accounted for more than 55% of the total 1990 emissions reported by industrialized countries worldwide, including the European Union, Russia, Japan, China, and India.<sup>6</sup>

With the introduction of the Kyoto Protocol, the world saw the birth of a “carbon market.” The market resulted from the compliance options available to signatory countries bound by Kyoto, which included: (1) allowance trading among signatory countries; and (2) purchase of offsets. Offsets are activities that reduce or sequester GHGs generated by a party who is not regulated under the emissions reduction program. Kyoto allowed for 2

4. See United Nations Framework Convention on Climate Change (UNFCCC) for a detailed summary of individual countries’ reduction obligations and status (<http://unfccc.int> under Kyoto Protocol).
5. As of this writing, 184 countries have ratified Kyoto.
6. See UNFCCC, *supra* note 4.

types of offsets, offsets created by emissions reduction projects in developing countries (known as the Clean Development Mechanism or CDM), and offsets produced by another ratifying country that was also bound to reduce its emissions (known as a Joint Initiative or JI). In all cases, the market for offsets and allowances was driven by the widely differing costs of controlling GHGs from country to country.

Although the effectiveness of the Kyoto Protocol has been criticized by countries such as the U.S.—the sole major developed nation that has not ratified Kyoto—due to, among other things, the lack of binding reductions requirements for developing nations and the fact that some members are not on target with their required reductions, Kyoto has served as a model for most of the voluntary and mandatory GHG cap and trade systems that have since emerged.

### **Emergence of a Voluntary Carbon Cap and Trade – the Chicago Climate Exchange**

While the Kyoto Protocol awaited execution by enough countries to make it effective, trading began in 2003 on the Chicago Climate Exchange (CCX), the world’s first voluntary, legally binding cap and trade system to reduce emissions of all six greenhouse gases. By joining CCX, members make a binding commitment to reduce their baseline emissions by 6% between 2003 and 2010.<sup>7</sup> Then, CCX issues allowances to the members in accordance with their baseline emissions and members must surrender allowances in accordance with the reduction schedule.

CCX members, which currently number some 350, have essentially the same trading opportunities as Kyoto ratifiers, albeit at significantly lower prices given the voluntary nature of the CCX market. They may trade excess allowances (based upon internal emissions reductions beyond their target) to other members who are lagging behind their target reduction. And, they may meet up to 4.5% of their emissions reduction targets by use of offsets, including offset projects that are generated by other CCX members (who have already hit their reduction targets) and offset projects generated by non-members.<sup>8</sup>

7. See generally [www.chicagoclimatex.com](http://www.chicagoclimatex.com). In Phase I, members committed to reduce emissions a minimum of 1% per year during 2003-2006, for a total reduction of 4% below baseline (their average emissions between 1998 and 2001). In Phase II, members commit to a reduction schedule that requires year 2010 emission reductions of 6% below baseline (usually their emissions during 2000).
8. Core CCX member rules can be viewed at [www.chicagoclimatex.com](http://www.chicagoclimatex.com).

Motives to join CCX may include internal company policies that support energy efficiency, accessing a market to sell an anticipated surplus of emissions reductions, practicing adjustment of a company's operations in anticipation of mandatory cap and trade systems, or enhancement of public image. To date, many prominent entities comprise the membership, including Ford Motor Company, Dow Chemical, DuPont, Steelcase, Kodak, DTE Energy, Sony, Motorola, Bank of America, Honeywell, Chicago, IL, New Mexico, Amtrak, and Michigan State University.<sup>9</sup> Recent data indicates that the total baseline emissions of members exceeds 500 million metric tons of CO<sub>2</sub>, more than any country in the world in terms of industrial emissions under a legally binding reduction commitment.

Short of the U.S. ratifying the Kyoto Protocol (or the successor to Kyoto) or implementing a national mandatory cap and trade, CCX represents the most readily accessible market for registration and sale of offsets generated by U.S. companies and landowners. For large-scale offset projects, however, private retailers that purchase and resell offsets may offer comparable access and better market pricing. The mandatory regional markets, discussed further below, may create additional opportunities for the sale of offsets generated by U.S. projects as well, but full-scale implementation of two of those three regional markets is still several years away.

### **What is a Carbon Offset and What Types of Marketable Offsets Can a Landowner Generate?**

A carbon offset represents the reduction of one metric ton (2,205 lbs) of carbon dioxide emissions. If you develop a project that reduces carbon dioxide emissions, every metric ton of CO<sub>2</sub> emissions reduced results in the creation of one carbon offset. There are hundreds of different types of carbon reduction projects, including renewable energy projects, destruction of industrial pollutants, destruction of landfill or farm animal-generated methane, energy efficiency and fuel switching projects, and agricultural and forestry projects.

For landowners and, specifically, farmers or foresters, depending upon the market where the offsets will be sold, offset projects may include sustainable forestry management, conservation tillage, permanent grass plantings, tree plantings (afforestation), and anaerobic manure digesters. The objective of agricultural and

forestry projects that generate offsets is to trap and keep as much CO<sub>2</sub> as possible in the soils and vegetation, by minimizing disturbance of the soils and maximizing the diverse growth and preservation of trees and vegetation, as soils can hold up to 183 years of CO<sub>2</sub> and forests can carry as much as 75 years of CO<sub>2</sub>.<sup>10</sup> For farm animal methane destruction projects, the primary objective is to minimize the release of methane—almost 20 times as potent as CO<sub>2</sub> as a GHG—by burning it, rather than allowing it to naturally decompose.

Whatever the source of an offset, exchanges, retailers and purchasers are focused on verifying that the offset represents a reliable, quantifiable, and actual reduction in CO<sub>2</sub> that would not have occurred in the absence of the proposed project. The starting point for this inquiry is generally establishing a baseline measurement of the emissions that would occur in the absence of the project. So, for instance, in a soil project, the baseline measurement would evaluate the per acre CO<sub>2</sub> release that would occur if normal tilling of the soil occurred. Once the baseline is established, the next step is calculating the projected CO<sub>2</sub> reduction that would result from the project (the absence of tilling, in the case of soil projects).

Because the manner of calculating release and sequestration with or without the project differs among projects and even within categories of projects, different protocols, or certification standards, have evolved to measure and verify emissions reductions. In addition to the variety of project-specific protocols, markets also vary in the standards that they favor. For example, the Chicago Climate Exchange uses one set of standards, and Kyoto uses another. In the voluntary market, a wide variety of other protocols exist to provide levels of verification and quality assurance.

The term “additionality” is also used in the offset market to refer to whether an offset project really creates “additional” CO<sub>2</sub> sequestration that would not have occurred in the absence of a market for offsets. Generally, additionality is questioned where the practice being undertaken would be economically efficient or desirable for the landowner even in the absence of the ability to sell an offset (e.g., if fuel switching would cost the user less over a relatively short term) or if the practice was already legally required (e.g., establishing a conservation easement for an old growth forest in a state that already prohibits the cutting of old growth stands). The concept of permanence is sometimes linked with additionality in terms of whether CO<sub>2</sub> reductions

com/about/pdf/ChicagoAccord\_050623.pdf.

9. See the CCX website for a comprehensive list of members at [www.chicagoclimatex.com/content.jsf?id=64](http://www.chicagoclimatex.com/content.jsf?id=64).

10. Clark, *Overview of CCX Soil Carbon Offsets*, (Chicago Climate Exchange, Inc. 2007), available online at <http://www.epa.gov/agstar/pdf/workshopfeb09/mccomb.pdf>.

from offsets are permanent or subject to reversal (e.g., a preserved forest subsequently burns down, the longer a tree ages after a certain point, the less efficiently it sequesters CO<sub>2</sub>, or the less wood that is unavailable as fuel (because it is being preserved), the more we may turn to fossil fuels).

Ultimately, all of these inquiries and standards, and much of the skepticism surrounding the offset market, centers upon whether offsets are as reliable in reducing emissions as actual reduction of emissions among the regulated market would be. There is some consensus that offsets are both a sound way to motivate the unregulated market to reduce its emissions and to offer more cost-effective means for the regulated market to achieve reduction. But significant differences of opinion exist as to what types of offset projects are credible enough, what certification and verification standards are sufficient, and to what extent offsets should be available in the compliance market to satisfy reduction requirements.

### What Are the Current Markets for Carbon Offsets Generated by Landowners?

The worldwide carbon market can be divided into 2 segments: the compliance market and the voluntary market. And, the voluntary market can be further divided into CCX and the over-the-counter (OTC) market.

#### The Compliance Market

In the compliance market, which significantly dwarfs the voluntary market, companies, governments, or other regulated entities buy carbon offsets to comply with caps on the total amount of CO<sub>2</sub> they are allowed to emit. In 2007, about \$13 billion of carbon offsets were purchased in the compliance market, representing more than 800 million metric tons of CO<sub>2</sub>e reductions.<sup>11</sup> Because there is no national emissions reduction policy in the U.S., and it has not ratified an international policy, the only current compliance markets in the U.S. are the emerging regional markets described in more detail below, and individual state markets where mandatory reduction requirements have been enacted (such as California's Global Warming Solutions Act of 2006).

11. Capoor and Ambrosi, *State and Trends of the Carbon Market 2007* (World Bank Institute 2007), p 1-2, available online at <http://siteresources.worldbank.org/NEWS/Resources/State&Trendsformatted06May10pm.pdf>.

#### The Voluntary Market

In the much smaller voluntary market, companies, governments, or even individuals purchase carbon offsets to mitigate their own GHG emissions from business operations, pollution, transportation, energy consumption, and other sources. In 2007, between \$258 and \$331 million of carbon offsets were purchased in the voluntary market, with more than 1/3 of the volume traded on CCX.<sup>12</sup> CCX does not publish data to indicate what percentage of its trading is comprised of offsets versus member allowances, but the majority of the OTC voluntary market trades represent the purchase and sale of offsets. Unfortunately, there is not significant linkage between the voluntary markets and the compliance markets (or even among the compliance markets) in terms of offset trading, largely because each has its own set of rules for the categories of offset projects that qualify under its program regime, its own certification and verification standards to ensure that offsets are reliable, and its own market pricing driven by widely divergent supply and demand dynamics.

For U.S. and Michigan landowners interested in generating and selling offsets, therefore, CCX and the OTC represent the primary markets, though the emerging regional markets may prove to generate additional demand in the coming years. And, depending upon the nature of the offset, CCX or the OTC may be the preferable market. For instance, in 2007, soil-sequestered carbon projects represented just 2% of offsets registered on the OTC, but a whopping 42% of CCX registered offsets.<sup>13</sup> On the other hand, that year, forest-based offsets accounted for about 3% of CCX registered offsets, but 20% of the OTC offset pool.<sup>14</sup> Accordingly, depending upon the relative market pricing, an offset producer may seek out one market over the other because it is more accessible or offers a higher trading price.

#### The Regional Accords

There are three U.S. regional accords to impose mandatory caps, one in the Northeast, one in the

12. Hamilton, Sjardin, Marcello, and Xu, *Forging a Frontier: State of the Voluntary Carbon Markets 2008* (Ecosystem Marketplace and New Carbon Finance 2008), p 25, available online at [http://www.ecosystemmarketplace.com/documents/cms\\_documents/2008\\_StateofVoluntaryCarbonMarket2.pdf](http://www.ecosystemmarketplace.com/documents/cms_documents/2008_StateofVoluntaryCarbonMarket2.pdf). Because CCX does not offer data for project-based CFIs (offsets) compared to allowance-based CFIs, it is unclear how much of the \$72 million traded on CCX were offsets, but the \$258 million OTC volume reflects chiefly offsets.

13. *Id.* at p 40.

14. *Id.*

Midwest, and one in the West. These also serve as potential additional markets for domestic landowners wishing to sell offsets. To date, however, the Northeast initiative is the only one that has entered its compliance period and determined the market price for allowances, with 2009 being the first compliance year in its 10-year program.

**RGGI-Northeast.**<sup>15</sup> During the same year that trading began on CCX, governors from nine Northeast and Mid-Atlantic States initiated discussions to form a regional cap and trade program, which culminated in the Regional Greenhouse Gas Initiative (RGGI). RGGI, ultimately encompassing ten States,<sup>16</sup> was the first mandatory cap and trade program in the U.S. and required a 10% regional reduction of GHG emissions between 2009 and 2018. Although there is potential to broaden the scope of RGGI, currently it solely regulates emissions from fossil fuel-fired electric power plants 25 megawatts or greater in size, which account for about 25% of all CO<sub>2</sub> emissions in the region.

Like CCX, RGGI permits compliance through use of emissions offsets, and emitters may only use offsets to satisfy a maximum of 3.3% (which could later be increased to 5-10%) of their compliance obligations. RGGI permits offset projects both within and without the RGGI states, but, at least for the moment, has a somewhat restrictive set of qualifying offset projects: methane capture from landfills and manure management, CO<sub>2</sub> sequestration from afforestation, reductions in SF<sub>6</sub> emissions, and reductions or avoidance of CO<sub>2</sub> emissions from end-use combustion of natural gas, oil, or propane achieved by end-user energy efficiency in the building sector.

The power plants that are regulated by RGGI obtain the majority of emissions allowances through quarterly auctions. Proceeds from the sale of allowances typically fund state programs that promote energy efficiency and projects for clean renewable energy, thereby reducing the overall compliance costs of the reduction program and its impact on electricity ratepayers, by reducing electricity demand.

**WCI-West.**<sup>17</sup> In 2007, the Western Climate Initiative (WCI) was launched by seven U.S. governors and four

Canadian premiers<sup>18</sup> to design and implement the U.S.'s second GHG regional cap and trade system. The WCI published design recommendations for its program in September 2008 that contemplated a phased program to commence January 2012 that would achieve a 15% regional reduction in GHGs over 2005 baseline emissions by 2020. A broader range of emissions would be covered under WCI's initiative than RGGI's, with regulation of electricity, industry, transportation, and residential and commercial fuel use for entities whose annual emissions exceed the threshold of 25,000 metric tons of CO<sub>2</sub>e. Guidelines for distribution of allowances to the regulated emitters are still being formulated and plan to permit a combination of grants and auctioning, with the objective of maximizing the number distributed by auction.

Like RGGI, WCI will also permit emitters to use offsets generated by projects within and without the region. In contrast to RGGI, WCI will allow a broader scope of permitted offset projects and a much higher percentage of offsets to be applied towards compliance: emitters may use offsets to satisfy up to 49% of their reduction requirements, and eligible categories of offsets include methane capture from landfills and manure and wastewater management, and sequestration of CO<sub>2</sub> achieved through no-till farming, afforestation/reforestation, forest management, forest preservation/conservation, and creation of long-life forest products. Measurement and monitoring of emissions is scheduled to commence during 2010, with reporting in 2011, and WCI is actively commenting on emerging federal reporting requirement standards to ensure that WCI allowances are fully recognized and valued in any federal program.

**The Midwestern Accord.**<sup>19</sup> In November 2007, the Governors of Iowa, Illinois, Kansas, Michigan, Minnesota, and Wisconsin, and the Premier of Manitoba entered into the Midwest Greenhouse Gas Reduction Accord (the Midwestern Accord), slated to develop the nation's third regional GHG emissions cap and trade program. The U.S. states who are members of the Midwestern Accord represent roughly 14% of total U.S. CO<sub>2</sub>e emissions, which is the highest percentage of the three U.S. regional cap and trade efforts.<sup>20</sup>

Last December, the much-anticipated draft recommendations for emissions reductions and the

15. See RGGI's website at [http://www.rggi.org/docs/program\\_summary\\_10\\_07.pdf](http://www.rggi.org/docs/program_summary_10_07.pdf), for this section's data.  
 16. Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont comprise the participating states in RGGI.  
 17. See WCI's website at <http://www.westernclimateinitiative.org/ewebeditpro/items/O104F21253.pdf>, for this section's data.

18. The participating members in WCI include Arizona, British Columbia, California, Manitoba, Montana, New Mexico, Ontario, Oregon, Quebec, Utah, and Washington.  
 19. Data in this section can be found at [http://www.midwesternaccord.org/Meeting%20material%20pages/GHG-meeting-8/Accord\\_recommendations\\_summary\\_document.pdf](http://www.midwesternaccord.org/Meeting%20material%20pages/GHG-meeting-8/Accord_recommendations_summary_document.pdf).  
 20. *WRI Fact Sheet*, *supra* note 2, relying upon WRI CAIT 2007 data.

design of the Midwest Accord's regional cap and trade system were released. The proposal seeks a 15-25% reduction below 2005 emissions levels of all six GHGs by 2020 and a 60-80% reduction by 2050. Power plants, industrial combustion sources (factories and other industrial facilities), industrial processing sources, and transportation fuels are proposed to be regulated. Residential, commercial and industrial fuel use might be phased in during the second three-year compliance period. There is not yet consensus as to whether allowances should be auctioned or allocated. But, there does seem to be agreement on inclusion of an offsets component in recognition of the potentially large economic development opportunity presented by the strong forestry and agriculture industries in the Midwest, and the desire to position the Midwest as a leader in offsets if and when a national program is launched.

### What Is the Procedure for Verifying a Marketable Carbon Offset and Selling It?

The Michigan Conservation and Climate Initiative (MCCI) is a joint project between the Delta Institute, the Michigan Association of Conservation Districts, and the State of Michigan. The project encourages GHG reductions from sound environmental practices and alerts farmers and landowners to the opportunity to earn GHG emissions credits when they use conservation tillage, plant grasses or trees, or manage forests sustainably. MCCI primarily offers guidance for selling offsets on CCX, and because CCX and the OTC provide the primary markets for landowner-generated offsets, this section will be limited to procedures for verification, registration, and sale of offsets on those markets.

**CCX.** All CCX eligible offset projects that produce less than 10,000 metric tons of CO<sub>2</sub>e of "Exchange Offsets" per year must be registered through a CCX-registered Aggregator. An Aggregator is a CCX-registered entity that serves as a representative on behalf of project owners of multiple CCX-qualifying offset projects. Aggregators currently working in Michigan include the Delta Institute, Iowa Farm Bureau, the National Farmers' Union, and Phase 3 Developments and Investments. Using an Aggregator enables owners of smaller lands, who might not otherwise be able to economically bear the transaction costs, to participate in the carbon market. The Delta Institute, a non-profit corporation, has served as the primary aggregator to-date on behalf of Michigan farmers and foresters looking to sell offsets on CCX.

Categories of CCX eligible offset projects for landowners include forestry, methane digesters, grasslands, and conservation tillage, all of which are third-party verified to ensure that they have resulted in real emissions reductions that would not have happened in the ordinary course of business. In addition, all soil and forest carbon sequestration projects are required to establish 20% reserves to guard against catastrophic losses of carbon stocks, which reserves are released to the offset owner at the end of the contract period. Highlights of the eligibility standards on a categorical basis follow below.

**Conservation/no-till farming**—For CCX purposes, conservation farming practices (no-till/strip-till farming) are defined as "managing the amount, orientation, and distribution of crop and other plant residue on the surface year-round while growing crops in narrow slots or tilled or residue-free strips in soil previously untilled by full width inversion implements."<sup>21</sup> A general guideline is that after the implement has been through the field, there must still be a substantial amount of surface residue present (at least 66%) and the soil disturbance must not be full width. If use of the implement would require that a leveling or smoothing activity follow, it would probably result in too much soil disturbance. Disturbing less than one-third of the row is a commonly accepted guideline. To be eligible the producer or landowner must make a contractual commitment to employ conservation farming through 2010 (or 2012, if trading continues beyond the current CCX commitment term). Eligible Michigan farms are credited at 0.4 or 0.6 metric tons of carbon dioxide (CO<sub>2</sub>) per acre per year, depending on land region.

**Sustainable forest management**—For CCX, sustainable forest management is defined as "the stewardship and use of forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national and global levels, and that does not cause damage to other ecosystems."<sup>22</sup> Sustainable forestry projects require third-party certification that the forest is sustainably managed, which must be approved by the CCX Forestry Committee and an owner's contractual commitment to maintain the land as forest for at least fifteen years, together with a good faith (non-binding) statement of

21. See <http://www.chicagoclimatex.com/content.jsf?id=781>, agricultural soil carbon FAQ link for this section's data.

22. See <http://www.chicagoclimatex.com/content.jsf?id=1684> and Managed Forests Project link for this section's data.

intent to maintain the forest for longer. Annual carbon sequestration values are based on stand inventories run through a growth-and-yield model.

**Conservation Lands**—Forestlands that are subjected to permanent conservation easements may also qualify as eligible offset projects based upon the increased CO<sub>2</sub> sequestered each year through 2010.

**Grass plantings** are also eligible practices.<sup>23</sup> A contractual commitment through 2010 (or 2012 if the CCX commitment term is extended) to maintain grass plantings must be made by the producer or landowner. Michigan grass plantings implemented after January 1, 1999, are credited at 1.0 metric tons of CO<sub>2</sub> per year.

**Tree planting** projects involving afforestation may also qualify.<sup>24</sup> Any purposeful conversion of non-forested or degraded land into a forest is eligible if initiated on or after January 1, 1990. Eligible plantings in Michigan can earn between 0.146 and 2.26 metric tons of CO<sub>2</sub> per acre per year, depending upon species and age. Landowners must sign a contract with CCX or their aggregator attesting that they will maintain the land as forest for at least fifteen years.

**Methane digesters** projects eligible under CCX are those that were in operation any time after 1999 and have installed biogas flow monitoring and/or electrical metering equipment. Methane is credited at approximately 18-21 metric tons of CO<sub>2</sub> per ton of methane, per year.<sup>25</sup>

The process for registration of all offsets on CCX follows roughly the same sequence of (1) verifying eligibility of a project according to the applicable CCX standard, (2) signing a contract with CCX or an aggregator committing to the applicable requirements during the contract period (together with photos, letters of intent, and other CCX-required documentation), (3) obtaining independent verification by a CCX-approved verifier who will use owner-provided information and sometimes site visits to assess a project's actual, annual GHG sequestration or destruction, (4) submitting the verification report for review by CCX staff as well as the CCX provider of regulatory services, FINRA, for

23. See <http://www.chicagoclimatex.com/content.jsf?id=781> for related information and supporting data.

24. See <http://www.chicagoclimatex.com/content.jsf?id=1682> and related links.

25. See <http://www.chicagoclimatex.com/content.jsf?id=103> and related links for this section's data.

completeness and accuracy, (5) upon CCX approval, enrolling the project with CCX through an offset aggregator or directly joining CCX as an offset provider (for larger enough projects), and (6) receiving Carbon Financial Instrument (CFI) contracts annually, in 100 ton increments, for project offsets that represent emissions reductions that have already occurred during the prior program year.

For farmers who wish to generate conservation farming or grassland planting offsets, there is not much further complication in the process and there are few initial costs, with most of the verification costs and aggregator/CCX fees being netted out of proceeds of the sale of credits. The first sale of credits will generally occur 12-14 months after enrollment as CFIs are issued retrospectively for actual, verifiable reductions that have already occurred. The Michigan Association of Conservation Districts is the CCX-approved third-party verifier that generally verifies soil carbon sequestration projects for Michigan landowners.

There are some additional steps and conditions that attend to registering forestry offsets with CCX. By way of background, the Michigan Forest Carbon Offset was introduced in 2006 through funding from the MI DNR, at which time the Delta Institute, with assistance from Grossman Forestry Company (Newberry) and Forest Resource Services (Gaylord), developed a pilot program that quantified the carbon sequestration benefits of sustainably managed forestlands in Michigan. Because that pilot program served as the basis for the CCX's Sustainably Managed Forest protocol, Michigan and Delta are both well-versed with the requirements necessary to satisfy that protocol.

In short, in addition to the steps listed above, all forestland owners must undertake, at their own cost (with financial assistance available from Michigan, in some instances) an inventory of their tree stock, which is a more complicated and expensive process than the inventory of acreage that farmers undertake to establish their baseline. The inventory must be performed by a "qualified forester," which, in Michigan, includes a Forest Stewardship Plan Writer. In addition, for offsets based on sustainable management, owners must obtain third-party certification that their forestlands are being sustainably managed (and present a sustainable management plan). For most parties, this entails joining an Individually Managed Tree Farm Group (IMG), which, in Michigan, is maintained by Forest Resource Services,

Grossman Forestry Co., or Green Timber Consulting Foresters (Pelkie).

Verification of all offset projects will occur upon initial enrollment, at the conclusion of the contract period and at any other intervals determined prudent by CCX. Generally, forestry projects may expect to have somewhat higher verification costs as initial verification is more involved, and annual verification of a portion of each property is required, in addition to verification of any reports losses or harvests, to ensure that the CFIs issued for the project continue to match the sequestration actually generated. Payments for CFIs are made annually for each year during the contract period.

**OTC.** The process for registering offsets on the OTC is not entirely dissimilar to the CCX process, but varies greatly in the areas of applicable protocols/certification standards, and verification methods. For instance, some retailers on the OTC do not apply any certification standards and others may apply standards ranging from the Voluntary Carbon Standard, to Green-e Climate, CCX's protocols, Climate Action Reserve protocols, or the CDM Gold Standard, to name a few. Somewhat surprisingly, some of the highest OTC trading prices were generated by non-certified and/or non-verified offsets, so the marketplace's view of reliability of offsets does not necessarily coincide with one particular certification standard.

### What Is the Current Value of a Carbon Offset?

The price of carbon offsets varies significantly from market to market due to the independent supply and demand forces shaping each one. Current and historical pricing information for a cross-section of the available markets is provided below to offer a glimpse of the range of income potential.

**CCX.** In past years, the market price for carbon offsets has ranged from \$1.00-\$7.00 per metric ton, with the highest price occurring during summer 2008, and appearing to coincide with the peak of petroleum prices.<sup>26</sup> Currently, the CCX price is just under \$2.00/metric ton of CO<sub>2</sub>. In terms of evaluating how much income potential a forest or farm project might generate at the \$2/metric ton price, conservation farming generates between 0.4–0.6 metric tons of CO<sub>2</sub> per acre annually and sustainable forestry management generates between 0.75–3.5 metric tons per acre of

26. Historical CFI pricing available online at <http://www.chicagoclimatex.com/market/data/summary.jsf>.

Michigan forest annually, depending upon the age and species of tree.<sup>27</sup> So, 1,000 acres of farmland generating offsets might earn between \$800 and \$1,200/year and 1,000 acres of forestland generating offsets might earn between \$1,500 and \$7,000, at current CCX market prices. Methane projects are credited at roughly 18 metric tons of CO<sub>2</sub> per ton of methane sequestered or combusted. Because projects that generate less than 10,000 metric tons per year must register through an aggregator, fees of 8%-10% may apply for sales to CCX through an aggregator and, in all cases, CCX charges \$0.20/metric ton for verification costs.

**RGGI.** Although there is no information yet available for offset sales, the Post-Settlement Reports from RGGI's first two pre-compliance auctions for 2009 allowances (each representing the right to emit 1 metric ton of CO<sub>2</sub>) offer a snapshot of allowance pricing to date, which should be indicative of offset pricing. The results indicated that 59 entities submitted bids in the September 2008 auction for 4 times the number of allowances available, and 69 entities submitted bids in the December auction for 3.5 times the number of allowances available, with approximately 80% of those who won allowances constituting compliance entities.<sup>28</sup> The average clearing price per allowance was between \$3.00 and \$3.50, which generated revenue for the 10 RGGI states of roughly \$145,000,000 for the sale of 44,071,285 allowances. Secondary market trading of allowances, although light compared to the volume auctioned, increased from a daily average of 155,000 allowances per day in September 2008 to 330,000 in January 2009, generating cautious optimistic for the competitiveness of the secondary market.

**Kyoto.** Once it has been accredited by the UNFCCC, a carbon offset project can be used as a carbon credit and linked with official emission trading schemes, such as the European Union Emission Trading Scheme or Kyoto Protocol, as Certified Emission Reductions (CER). As of April 2009, CERs were trading at just about €10 per metric ton, with the price varying significantly between March 2008 and April 2009, from lows around €7 to highs near €25.<sup>29</sup>

27. Vollmer-Sanders, *Climate Change Basics* (Michigan Farm Bureau 2008), p 11-15 (available online at <http://www.michfb.com/pdfs/issues/energy/Climate%20Change%20Basics.pdf>). For a carbon calculator specific to Michigan lands, see <http://michiganclimate.org/conservationcalculator.php>.

28. Potomac Economics, *Report on the Secondary Market for RGGI CO<sub>2</sub> Allowances*, (March 4, 2009) (available online at [http://www.rggi.org/docs/Secondary\\_Market\\_Report\\_News\\_Release\\_FINAL.pdf](http://www.rggi.org/docs/Secondary_Market_Report_News_Release_FINAL.pdf)).

29. See CER Futures historical data, available online at <http://www.ecx.eu/index.php/CER-Futures>.

**Other Offset Providers.** The 25 most prominent North American companies selling offsets to individuals and companies privately (not through an exchange) offer offsets from \$5 to \$30 per metric ton of CO<sub>2</sub>, with varying categories of projects and levels of verifiability and certification that may contribute, to some degree, to the price differentials.<sup>30</sup>

### Are Michigan Landowners Currently Participating in the Carbon Offset Market?

According to the 2007 Census of Agriculture, there are some 56,000 farms in Michigan, encompassing about 10 million acres, of which approximately 2,000 are large farms (of 1,000 acres or more) that comprise almost 40% of the overall farming acreage.<sup>31</sup> And, as of the end of 2008, Michigan had between 10 and 13 million acres of private forest lands.<sup>32</sup> So, focusing solely on creation of carbon offsets from agricultural practices and forestry management, there is a great deal of opportunity for Michigan landowners to participate.

Indeed, as of November 7, 2008, the Delta Institute, the most active aggregator of Michigan offsets for sale on CCX, had some 350 contracts signed for a total of 134,240 acres—31,953 of them tillage acreage, 12,171 grass acreage, and 90,116 forest acreage.<sup>33</sup> In terms of dollars for Michigan forestland participants, the Delta Institute generated \$435,980 in gross revenue from the sale on CCX of 2007-vintage carbon credits from Michigan sustainably managed forestlands. The sale represented the 172,000 metric tons of carbon sequestered during the 2007 growing season for the 48,665 acres of certified forestlands enrolled.<sup>34</sup> So, after administrative fees, the initial 34 Michigan landowners in the program earned \$389,097 or \$8 per acre annually for carbon sequestered through sustainable forestry management and good stewardship. Delta completed the second enrollment period for the managed forest

30. For current pricing and verification standards among private for profit and non-profit offset providers per metric ton of CO<sub>2</sub>e, see generally <http://www.carboncatalog.org/providers/north-america/companies/?currency=USD> and [http://www.ecobusinesslinks.com/carbon\\_offset\\_wind\\_credits\\_carbon\\_reduction.htm](http://www.ecobusinesslinks.com/carbon_offset_wind_credits_carbon_reduction.htm).

31. See 2007 Agriculture Census, Michigan Report available online at [http://www.agcensus.usda.gov/Publications/2007/Full\\_Report/Volume\\_1,\\_Chapter\\_1\\_State\\_Level/Michigan/st26\\_1\\_058\\_058.pdf](http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_1_State_Level/Michigan/st26_1_058_058.pdf).

32. See Michigan State & Private Forestry Fact Sheet (2008), available online at [http://www.na.fs.fed.us/ra/factsheets/mi\\_std.pdf](http://www.na.fs.fed.us/ra/factsheets/mi_std.pdf).

33. Delta Institute Press Release, November 2008 (available online at <http://deltacarbon.org/aggregation/documents/DeltaManagedForestReleaseNov08.pdf>).

34. *Id.*, see also sample contract at <http://www.deltacarbon.org/aggregation/documents/XSOContractP2E2.pdf>.

program, accepting additional enrollments from 37 Michigan landowners with 40,480 acres, and a third enrollment period was open through the spring of 2009.

On the methane digester front, three different Michigan farms have obtained 100% financing for digester projects through long-term contracts with a California company called TerraPass (a private aggregator and seller of carbon offsets), which validated and verified all three according to the California Climate Action Registry protocols.

The first, Scenic View Dairy I, located in Fennville, Michigan, commenced in 2006 and constituted the first digester plant in Michigan and the first U.S. digester plant to generate both electricity and pipeline grade natural gas. Instead of collecting manure from its 2,200 cow facility in open lagoons where it formerly decomposed and released large amounts of methane—nearly 20 times as harmful a GHG as CO<sub>2</sub>—the farm now feeds manure into three tanks, with the methane from the digesters being treated for one of two purposes: some gas is fed into electric generators, which produce power for the farm and for export to the grid; other gas is fed into the public natural gas pipeline and sold to a local distribution company for use by other customers. Scenic View Dairy I has a sister operation in Freeport that commenced similar operations in 2008 at its 3,000 cow facility, with oversized digester tanks that it hopes will eventually accept additional manure from nearby farms.

The third project, Geerlings Hillside Farms, also commenced in 2008, in Overisel, Michigan, at an 8,000 swine facility, where manure was redirected to digesters from under floor storage, where it was formerly stored and eventually trucked for field application nearby. Geerlings constituted the first centralized digester in Michigan, receiving manure from four nearby farms to render the digester operations economical. In addition, a nutrient recovery system was implemented to recover and sell as fertilizer the nutrient-rich solids from the digester effluent (to be applied in areas with normal phosphorus concentrations in soils) and to offer the liquid digestate as irrigating water to local fields during crop cultivation periods.

Still, fewer than 1% of the total potential acreage is enrolled in such conservation tillage, forestry management, and digester operations. Given the emerging Michigan policies that favor renewable energy standards and its participation in the Midwestern Accord, it is reasonable to expect that more landowners will be motivated to participate in both conservation practices and the offset market.

## What is the Future of Cap and Trade and Carbon Offsets Nationally?

On March 10, 2009, in response to the 2007 legislation<sup>35</sup> that directed the Environmental Protection Agency (EPA) to design a national, mandatory, GHG emissions registry, the EPA released its proposal for mandatory reporting. According to the proposed "Mandatory Greenhouse Gas Reporting Rule,"<sup>36</sup> all suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions would submit annual emissions reports to EPA.<sup>37</sup> Reporting for sectors such as the utilities, oil and gas producers, and chemical refineries would start in 2011, while automobile manufacturers will start up on their 2011 models.

35. FY2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), an excerpt of which reads, "Of the funds provided in the Environmental Programs and Management account, not less than \$3,500,000 shall be provided for activities to develop and publish a draft rule not later than 9 months after the date of enactment of this Act, and a final rule not later than 18 months after the date of enactment of this Act, to require mandatory reporting of greenhouse gas emissions above appropriate thresholds in all sectors of the economy of the United States."

36. The gases covered by the proposed rule are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF<sub>6</sub>), and other fluorinated gases including nitrogen trifluoride (NF<sub>3</sub>) and hydrofluorinated ethers (HFE).

37. Cathy Milbourn, *EPA Proposes First National Reporting on Greenhouse Gas Emissions* (EPA press release 3/10/09) available online at <http://yosemite.epa.gov/opa/admpress.nsf/6424ac1caa800aab85257359003f5337/4bd0e6c514ec1075852575750053e7c0!OpenDocument>

In application, the proposal would subject 85%-90% (some 13,000 facilities) of all U.S. GHG emissions to mandatory reporting. Because a reliable record of emissions data in the form of a national greenhouse gas registry is a prerequisite to any national cap and trade or other emissions reduction program, those who favor such policies welcome the proposal. Unlike current voluntary programs, the federal registry will track emissions on the basis of each individual facility (versus company-wide data) and compel participation of all covered entities.

With this initiative, the federal government appears to be taking the first steps towards implementation of a national carbon cap and trade system. While it is unclear at this stage how offsets would be defined under a national emissions reduction policy, it is likely that they will feature prominently in any discussions and remain conceptually relevant to compliance options. Indeed, two of the most prominent legislative proposals for national emissions trading programs would allow domestic offsets to be used to fulfill an entity's reduction obligations.<sup>38</sup> In any case, it will be interesting to see how this emerging domestic policy affects the U.S.'s global outlook and whether it prompts the U.S. to ratify a new international agreement at the 2012 UNFCCC conference in Copenhagen, when the Kyoto Protocol is scheduled to expire.

38. *America's Climate Security Act* (S. 2192, sponsored by Senator Lieberman and Senator Warner) proposes that domestic offsets may fulfill up to 15% of an entity's compliance obligations and the *Low Carbon Economy Act* (S. 1766, sponsored by Senator Bingaman and Senator Specter) would allow an unlimited percentage of domestic offsets to be used.