

# Private Market Solutions for Greenhouse Gas Emissions (GHG) Trading

*John Steinhoff and Martha Grasty, EnVise LLC*

## ABSTRACT

Although the Chicago Climate Exchange (CCX) is emerging as the marketplace to trade for greenhouse gas (GHG) emissions credits and many state registries have been created, many industrial customers are not currently willing to join these organizations.

However, many of these customers, through good business practices, are already creating GHG emissions reductions, which, through proper verification, can be quantified and traded through bilateral agreements. Many of these customers are seeking a private market to trade these emissions credits and a secondary market is developing. Word-of-mouth and relationships are driving the development of this market. When collaborations occur, both parties benefit, but often in different ways. Some of these benefits include energy use reductions or greater use of renewable sources, lower operating and environmental costs, and GHG reductions. Through this very low-tech process, like-minded businesses are striking bilateral arrangements to trade or purchase GHG emissions credits.

This paper will discuss the reasons for the creation of this secondary market, discuss the ancillary benefits of these collaborations, and offer examples of this market at work.

## Introduction

Although the Chicago Climate Exchange (CCX), North America's first and only emissions registry, reduction and trading system, is emerging as a viable market for members to trade greenhouse gas (GHG) emissions credits, many industrial customers are not currently willing to join this formal climate exchange group ([www.chicagoclimateex.com](http://www.chicagoclimateex.com)). It is too new and frankly, too much of a "black box" to many customers in the U.S. *An emissions credit is defined as a commodity that gives the holder the right to emit a certain level of GHGs. These credits are currently tradable between entities and on exchanges such as the CCX ([www.ghgprotocol.org](http://www.ghgprotocol.org)).*

On May 10, 2007, the New York Mercantile Exchange (NYMEX) announced that it would begin to offer contracts to trade carbon dioxide (MSNBC, 2007). This entry into the market may signal competition for the CCX, which has played an important role in the creation of many other exchanges around the world. The European Climate Exchange (ECX), a sister company of the CCX, was established in 2005. And in July 2006, the Montreal Climate Exchange (MCeX) was created from a partnership between the Montreal Exchange and the CCX. In Asia, carbon credit trading has been occurring between both developed and undeveloped nations through the United Nations' Clean Development Mechanism (CDM).

Many states, such as California, have taken a slightly different approach and have created voluntary registries. For example, the California Climate Registry, is a non-profit public/private voluntary GHG registry ([www.climateregistry.org](http://www.climateregistry.org)). Its goal is to help California's businesses and organizations establish GHG baselines against which they can measure any future emissions reduction requirements.

The concept of measuring and accounting for GHG emissions is in its infancy to the “average” business customer in most parts of the U.S., especially those outside California. Many customers are just learning the definitions of some of the key terms that comprise this discussion. These terms include emissions credit (see above for definition), greenhouse gas, carbon dioxide, cap and trade system—the list of concepts is long and new to many. Businesses are also being placed in middle of the politics/science debate, which is not typically a comfortable position for most businesses. However, many corporations, many of them with international business operations, are taking a stand on sustainability and climate issues, which has helped to elevate and legitimize recent dialog (Margolick and Russell, 2001).

Despite their reticence to participate officially through the CCX at this time, many industrial customers, through good business practices, are already creating GHG emissions reductions. These reductions, once they are properly verified, can be quantified and traded. However, customers are choosing other, more private approaches to achieve this goal.

One such approach is through bilateral agreements with other customers. In essence, these customers are seeking a separate, private market to trade these emissions credits and a secondary market is developing.

Word-of-mouth and relationships are driving the development of this market. When collaborations occur, both parties benefit, but often in different ways. Some of these benefits include energy use reductions or greater use of renewable sources, lower operating and environmental costs, and greenhouse gas reductions. Through this process, like-minded businesses are striking bilateral arrangements to trade or purchase GHG emissions credits.

## **The Evolution of “The Green Plan”**

Although the news and discussion related to climate change has increased dramatically in the past year, most commercial and industrial customers do not have “save the planet” at the top of their to-do list. What they do have on their lists are simple things like: 1) improve profitability, 2) increase market share, and 3) remain competitive. Some of the drivers behind these lists have led to the evolution of what can be called a “Green Plan.” Most companies now recognize that customers appreciate companies that try to incorporate “environmental friendliness” or “green” aspects into their operations (Barbaro, 2007). Sometimes this may involve a very effective public communications plan, and sometimes it also involves real actions that provide actual environmental benefits.

A “Green Plan” involves working with a customer and helping them evaluate their business from a “green” perspective. How can they improve their facility’s energy efficiency? Can they reduce GHG emissions? Can they change production processes and improve manufacturing efficiency? Can they use a renewable energy source? Can they use recycled products? Answers to these questions and more help the customer begin to examine the options that make sense to their specific operation.

EnVise would like to take credit for devising this strategy and creating the concept of a Green Plan after a great deal of planning and, of course, well-placed marketing fanfare. The fact of the matter is that, like most things in life, the development of the Green Plan concept has been largely based on one part “necessity is the mother of invention” and two parts serendipity.

EnVise works with many industrial companies each year to identify and implement energy reduction strategies. These long-term efforts have evolved into a secondary area of customer assistance: helping customers identify the components and associated benefits of their

Green Plan. When working with customers, three steps are critical: 1) educate customers about the issues related to the world's climate change which will directly impact their own business climate; 2) develop a Green Plan for the customer that leverages their green opportunities and allows them to use these opportunities to meet the short and long-term needs of their business, and 3) play matchmaker by bringing together the right combination of companies to make collaborative Green Plans a reality.

One of the interesting outcomes of helping customers develop Green Plans has been the unexpected appearance of a private, secondary market for the production, certification, and trading of GHG credits. *We cannot say with scientific or statistical certainty that this market exists everywhere in the U.S. We also have found little published research into this situation, most likely because customers—like the ones we work with—typically require executed confidentiality agreements for all work we do for them.* We expect that this situation will change and that as the subject of GHG emissions trading becomes better understood, more customers will be willing to talk publicly about their practices and experiences.

That said, we have spent a considerable amount of time in past few years educating dozens of customers about the GHG reductions associated with the energy efficiency reduction projects we identify and implement for them. The development of a GHG credit is a relatively new phenomenon which few customers truly understand. In some cases, a customer who is used to trading other commodities such as steel or jet fuel or natural gas futures “gets it” after a fairly brief introduction.

If a customer does not have this experience, then this discussion can be quite a challenge. EnVise staff has spent decades working in the energy industry. We liken explaining a GHG credit to explaining power factor. They are both invisible, they are both somewhat complex, but, most important, they both have an economic impact on a customer's business.

The remainder of this paper discusses practical experiences in this new secondary market.

## Background

In order to put the practical, real-world experiences with industrial customers presented in this paper into perspective, several unscientific observations must be offered:

- 1) Based on EnVise staff's work with dozens of industrial customers during the past two years, only twenty percent of customers marketed to, worked with, or talked to over a cup of coffee know what a GHG emission credit is.
- 2) Conversely, 100 percent of the utility staff people encountered in the last two years know exactly what an emission credit is and are very curious to know why the subject is being raised with them.
- 3) Less than ten percent of private industry, including large commercial and industrial customers, have any knowledge of the CCX and its mission and associated benefits.
- 4) More than fifty percent of customers believe that climate change is an issue that must be dealt with, most likely on a Federal level for consistency. Those that raise the “Federal” solution are customers with facilities in multiple states or countries and try to deal every day with the inconsistencies of doing business in these different jurisdictions.
- 5) Of those that understand the concept of an emissions cap and trade system, a majority believe that the states and/or the Federal government will implement a state/regional/national cap and trade program within the next three to five years.

- 6) Four years ago, only one customer was interested in initiatives that would make it a “greener company” both in terms of its actions and its perception of being green within the marketplace. Today, the vast majority of customers want to be greener and are looking for ways to reduce environmental impacts of their operations, purchase greener products, and find ways to market themselves as “green.”
- 7) Today, every EnVise customer that has set goals to become greener has seen benefits that far outweigh the cost. Being green makes good economic sense: no ifs, ands, or buts about it. These benefits include: 1) increased energy efficiency, which helps them manage rapidly rising energy bills more effectively, 2) improved operational productivity, 3) initial steps into the use of renewable energy sources; 4) a greater attention to GHG emissions and ways to manage or reduce them; and 5) the associated “public relations” benefits that come from steps one through four.

## **Part I of the Green Plan: “It’s the Environment Stupid”**

At this writing, the number of customers who have implemented an energy reduction project primarily because it reduced GHG emissions is quite small. More customers will begin placing a greater emphasis on GHG reductions as the market for emissions credits matures. The development and expansion of the CCX in North America is certainly contributing to building this market.

The on-again, off-again discussions at the national level of a mandatory cap and trade emissions trading system certainly impacts the market, depending on the status of the current discussion (“mandatory or not?”). NYMEX’s just-announced entry into the carbon-trading market is not surprising, given the expectation that the U.S. is likely to follow the European Union’s lead and institute some form of mandatory cap and trade system within the next three to five years. NYMEX is already the world’s largest energy futures exchange (MSNBC, 2007).

The state of California recently took matters into its own hands. It recently passed Assembly Bill 32, the “California Global Warming Solutions Act of 2006” which is the first state law to comprehensively limit GHG emissions at the state level. It was signed into law by Governor Schwarzenegger on September 27, 2006 ([www.climateregistry.org](http://www.climateregistry.org)).

What additional factors are driving the creation of a market for GHG emission credits? The pure and simple fact is that industrial customers are implementing more advanced environmental solutions that create emission credits as a derivative benefit. The environmental solutions take many forms, but in most cases they involve the extraction of methane from existing landfills or the movement away from landfill operations to new forms of waste processing, including anaerobic digestion.

In most cases, industrial customers did not even know that they had created a benefit in addition to the primary environmental problem that they were solving. This is where a company like EnVise gets involved. We help the customer understand the value, quantity, and quality of the GHG emission credits that they are creating. Most importantly, we help them understand the marketing and potential financial value of these emissions credits. At times, the customer misses the opportunity due to their lack of knowledge; they will sell their available emissions credits to a utility or emissions aggregator for pennies on the dollar. They may be worth only \$3.75 on May 10, 2007 ([www.chicagoclimateex.org](http://www.chicagoclimateex.org)), but it is highly likely they will increase in value in the future.

## **Part II of the Plan: Develop Options**

“Ok, so we have 50,000 tons of emission credits, so what? We make paper.”

This is a typical response from customers after calculating the amount of GHG credits that have or will be produced at their facility. The question is not born out of ignorance but rather a lack of knowledge or experience in knowing how to deal with this opportunity. At this point in the process, it is critical to talk with customers about their options. These include: 1) ignore the opportunity, 2) sell the credits to an emissions aggregator and let them make all the money, 3) become a member of the CCX, or 4) find a private company or companies with whom to partner who would like to purchase these emission credits and strike a private trade.

The CCX plays a critical role in the financial marketplace and this role may expand as the market for emissions credits grows and/or if a mandatory cap and trade system is established. However, at this point in time, many customers do not have the knowledge, time, corporate support or inclination to join the CCX.

The term “black box” was used in the Introduction section above, and it can be repeated here. The CCX is a complex financial exchange for trading the six primary greenhouse gases: carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, perfluorocarbons, and hydrofluorocarbons.

The staff members for industrial customers, at least many who work in facilities engineering, environmental, and plant management and operations positions, are not knowledgeable about how complex financial markets work, especially commodity and futures markets. Therefore, they are not inclined to become involved unless mandated by senior management to do so. Also, the direct feedback from several industrial customers who have visited the CCX Website is one of confusion—they did not understand what the CCX could do for them. The CCX is a complex financial market and its Website was created for the financial community, not for customers trying to learn about a new commodity market. As a comparison, the Website for NYMEX ([www.nymex.com](http://www.nymex.com)) has sections that offer a better introduction to the purpose, goals, operations, and accessibility of this Exchange.

On the other hand, the California Climate Registry’s Website was definitely created for customers. It clearly defines what customers need to know, what’s “in it for them,” and what steps they need to take to verify their GHG emissions. It offers an excellent resource for customers, even if they cannot participate in California’s climate registry system.

Given the four options listed above and the complexities of the CCX, customers typically follow one of two options: 1) do nothing, or 2) seek out businesses that they can work with to form a bilateral relationship that will provide all entities involved with mutual benefits, with little or no risk and modest investment. If customers are inclined to pursue option two, EnVise works with them to make it happen.

## **Verification and Documentation Are Key to Option Development**

The importance of proper verification of GHG emissions credits cannot be stressed enough. Potential partners in a bilateral trading relationship do not want “questionable” emission credits. They want to be assured that the emission credits they are buying have been properly quantified and verified.

There is currently no standard verification protocol used in the U.S. California has adopted the General Protocol and industry-specific protocols based on the Greenhouse Gas

Protocol Initiative, a decade-long partnership between the World Resources Institute and the World Business Council for Sustainable Development ([www.ghgprotocol.org](http://www.ghgprotocol.org)).

This lack of consistent protocol, obviously, represents a challenge. EnVise LLC decided to seek training in GHG verification protocols based on the Greenhouse Gas Protocol Initiative, and attended, completed, and passed the GHG Verification Training Course sponsored by Environment Canada in Toronto in 2006. These protocols are based on ISO Standards 14064-1 through 3 and 14065 as well as those in *The Corporate Greenhouse Verification Guideline* prepared by the Environmental Resources Trust and the *DOE 1605(b) Greenhouse Gas Registry*. This training and background provides a verification service to customers that include documenting and verifying all emission credits.

Unfortunately, several business entities have attempted to market non-verified emission credits recently. To date, we are not aware of any transactions resulting from these offers.

### **Part III of the Plan: Find a Counterparty With Which to Partner**

This is where the role of matchmaker gets played. The market for emission credits obviously lacks liquidity. Therefore, someone must play the role of bringing together potential emissions sellers with potential emissions buyers. Due to the fact that most customers work in highly competitive markets, this matchmaking is usually done on a confidential basis.

In our experience is that the best bilateral arrangements are those in which the emissions credit trading forms the basis for the relationship, but additional opportunities and benefits are combined to create a truly strategic business relationship. A perfect example of this type of symbiotic relationship is one in which the purchaser of the emission credits sends a waste stream to the emissions credit producer for processing. This is truly “win-win” in that the purchaser can make a stronger case to management to purchase the credits because they are also solving a waste disposal issue. The producer of emissions credits also wins because they obtain additional feedstock which can be used to generate additional GHG credits.

The most important aspect of a bilateral emissions trading arrangement is that it cannot be solely for financial purposes at this point in time. We have not seen one successful trading arrangement that was fueled only by the promise of financial gain. This situation will likely change in the future as emissions credits become a more valuable commodity. But right now, the customers who are engaging in this type of transaction are interested in being “green” for a variety of reasons. If financial benefits accrue, that is certainly a good thing, but they perceive other benefits as well.

A successful transaction most often results when two or more entities have a shared corporate culture, similar environmental goals, and internal processes that can provide the required approvals fairly quickly (e.g., 30 to 60 days).

### **Part IV of the Plan: Negotiate an Agreement that Works for Everyone**

First of all, a bilateral emissions trading agreement must be truly bilateral. The best agreements include some good “horse trading.” As the case study presented at the end of this paper illustrates, the purchaser of the emissions credits assisted the provider of the emissions credits with financial investment to improve their process. In exchange for this investment, the provider of the credits offered a discounted rate on the credits. In other words, these deals should be structured outside the box. If a customer wants to strictly buy or sell emissions credits,

then the customer should simply join and work through the CCX. A bilateral agreement requires greater flexibility and ingenuity to be successful.

The second major component of a successful bilateral agreement should emphasize flexibility. Most industrial customers in this country are going through significant changes in terms of what they make, how they make it, where they make it, and how long before they will stop making it. Trying to lock an industrial customer into a contract that is anything over two years in length will most likely result in failure.

Therefore, bilateral emission trading contracts should have “off ramps” that allow the parties to dissolve the agreement if business climates change, regulations change, or the original agreement just does not work for one or more of the parties to the agreement. The contracts that are developed should be simple and limited to no more than three pages, with clearly defined pricing, and the ability to revisit the terms of the agreement on a periodic (annual) basis.

### **A Real World Example: How the Green Plan Works**

The following “real world” example has just been completed. It offers an excellent example of how all the components and steps discussed above came together to create a very successful business relationship that meets the needs of three separate entities.

In order to protect the customers’ identities and the confidentiality of agreements, the names of the companies involved in this case study cannot be shared. However, the emissions provider is a paper company, the emissions purchaser is a distributor of retail goods, and a third party involved in the agreement is a poultry farmer located in a non-attainment zone.

#### **The Opportunity**

As stated earlier, EnVise works with a diverse group of customers who all have different business types and goals. The bilateral emissions trading opportunity started out with a distributor of retail goods that wanted to reduce its landfill requirements. The company was also looking at ways to link the reduction of land-filled waste with the production of GHG emission credits that would help them meet their corporate sustainability goals. Some quick math revealed that internal processing of the waste would not be a cost-effective solution.

Which brings us back to “necessity being the mother of invention.” As is typical, this customer had a problem that was seeking a solution. On the other hand, another customer had a solution but was looking for additional feedstock. This second customer is a large paper producer who recently modified its waste disposal process, eliminating the land filling of paper sludge and replacing it with an anaerobic processing system that converts the waste sludge into methane and landscape grade compost.

In discussions with this company, the topic of GHG emission credits arose. The key contact was aware of them and had estimated that the company’s new process was creating emissions credits in the range of 30,000 to 50,000 tons per year. The credits are created because the plant has displaced its use of natural gas with the use of the methane derived from the anaerobic process. Through these discussions, the customer was also interested in attaching some value to the emissions credits through their sale. These discussions included the possibility of selling the credits through the CCX. After subsequent internal discussions with senior management, a decision was made that the company did not want to join the CCX at this point in time.

So there are now two parties in this match: 1) a company with a waste disposal issue wants to link the disposal to the production of GHG emissions credits and 2) a company that has a process for dealing with waste streams and has produced an abundant supply of GHG emissions credits.

### **Matchmaking: Creating A Bilateral Opportunity**

Creating a bilateral market for GHG credits is no different than matching up a buyer and a seller. So, the concept of a joint, bilateral opportunity was introduced to both customers. The proposed opportunity consisted of the retail goods distributor removing their waste stream from the landfill stream and shipping it to the paper company for anaerobic processing. The anaerobic processing would produce additional GHG emission credits which the retail goods distributor would buy from the paper company. In exchange the paper producer would: 1) receive additional waste that could be converted to energy, and 2) prove the validity and value of reducing GHG emissions.

As is typical with most projects of this type, the initial discussions on this opportunity generated more questions than answers. This resulted in additional research and the creation of several options for the two companies to partner and achieve their mutual objectives. Options considered included the quantity and quality of the waste shipments by the retail goods distributor, the differential cost of shipping waste versus land filling and several storage and processing options for the paper producer on the receiving end.

Despite the inevitable issues and associated risks, the key to creating the opportunity was the personalities of the individuals involved and the corporate culture of both companies. Both the individuals and their respective companies were willing to think “outside the box” and remove some barriers to implementation. More importantly, both were focused on non-monetary issues with the assumption that there was a solution to this issue once all of the mechanics were worked out. Last but not least, the chemistry between the individuals and their respective corporations was very good.

### **Solving the Technical Issues**

An important role played by a firm like EnVise in opportunities such as this one is “technical problem solver.” In this case, we developed a pilot test phase whereby the retail goods distributor sent samples of the landfill product to the paper company for testing and analysis. The value of the pilot cannot be overstated. The pilot identified several potential barriers to processing including: 1) the consistency of the landfill product and 2) the fact that the landfill product was high in moisture content and prone to freezing.

The identification of these issues allowed “the team” which we had become by this time, to work the problem. Solutions developed included removing solids from the waste product and shipping it as slurry which would be easier for the paper producer to store and process.

### **Creative Pricing: Meeting the Goals of Both Parties**

After a summer’s worth of work, the only real issues that remained were pricing and an associated contract. The contract was relatively easy because the culture of both companies was



similar. The contact is simple in scope, very clear in expectations, and provides both companies with “off ramps” if business processes or the overall business climate changes.

In terms of pricing, this worked itself out through the solution of remaining technical issue, which was the fact that the waste would freeze during the winter and could not be processed. The retail goods distributor agreed to pay for the disposal of the landfill through the purchase of GHG emissions at a price competitive with the CCX. The numbers were refined so that the paper producer would be guaranteed a cash flow that would allow them to install heated storage tanks for the waste product.

The pricing was structured in such a way that the paper producer’s investment in the storage handling equipment and additional labor would meet the corporation’s internal financial requirements. The price of the verified emissions credit purchased by the retail goods distributor was slightly less than the cost of an emissions credit on the CCX.

### **Verification and Certification of the GHG Emissions**

As part of the agreement, both parties agreed that the emissions would be verified and certified based on ISO Standards 14064-1 through 3. Certification would occur on an annual basis. EnVise made it clear to all parties that each should consider seeking an independent GHG verifier so that each party would be comfortable with the GHG emission verification and certification findings. Neither customer chose that option, even though they acknowledged that there was an appearance of a conflict of interest (the same company had brought both parties together and then was verifying the emissions).

Both felt comfortable with the relationships they had developed with EnVise, which was gratifying. But the other reality is this: there are currently very few individuals or firms outside of California who can provide this type of GHG verification and certification service.

Both firms retained EnVise to conduct GHG verification and ensure that the emissions credits generated and purchased by the retail goods distributor will be acceptable to the paper producer and other entities including the CCX, EPA, DOE, state agencies, utilities and other parties that may be interested in the emissions credits.

### **Additional Benefits: One More Participant**

This project became even more interesting when we started weighing the cost of shipping the landfill waste to the paper mill instead of the landfill site. Although the cost of transportation did not ruin the economics of the opportunity, we were exploring ways to avoid having empty trucks coming back from the mill. This is when a new participant entered into the project.

For several years, a poultry producer who happened to be located close to the retail goods distributor had been trying to find an economical way to ship wood waste from the paper mill to its facility. The wood waste is particularly effective in absorbing ammonia from the air. Since ammonia is a large off-gas from poultry producers, and this particular plant is in a non-attainment zone, the poultry producer was under pressure to find a solution to its ammonia production problem.

The bilateral GHG emission credit agreement (which we now consider a trilateral agreement) solved the poultry producer’s problems because we quickly determined that we could reduce the cost of transporting the landfill by back-hauling wood waste for the poultry producer at a cost that met their needs.

## **The Final Green Plan Product: A Cost-Effective and Sustainable Process**

This case study clearly illustrates that a Green Plan, consisting of individual customers brought together by well defined needs and the development of mutual benefits, can and does work. This case study and additional projects currently underway proves that there is a developing market for bilateral agreements between companies to leverage the value of GHG emissions credits.

In the long term, we believe that this informal process of structured bilateral agreements will evolve into a more liquid market driven by the CCX or other exchanges. In the meantime (the next 3 to 5 years), we see an expanding need to identify these opportunities, make the matches between compatible customers, and solve the technical challenges.

As this market matures, it will help companies utilize green partnerships to enhance their business. It will also support sustainable opportunities that will become the norm rather than the exception. In the end, we strongly believe that the climates of individual businesses we work with and the world's climate as a whole will benefit from these humble beginnings.

### **References**

<http://www.msnbc.msn.com/id/18591849/>

[www.chicagoclimateex.com](http://www.chicagoclimateex.com)

[www.ghgprotocol.org](http://www.ghgprotocol.org), for definition of "Emissions Credit." Exact link is:  
<http://www.ghgprotocol.org/templates/GHG5/layout.asp?type=p&MenuId=OTEz>

Ramakrishnan, Kishore Kumar. April 2007. "Introducing Greenhouse Gas Trading in Asian Commodity Exchanges." Capital Markets Group, Infosys Technologies.  
<http://www.advancedtrading.com/streetcred/showArticle.jhtml?articleID=199000180>

[www.climateregistry.org](http://www.climateregistry.org)

Margolick, Michael and Russell, Douglas. November 2001. *Corporate Greenhouse Gas Reduction Targets*. Global Change Strategies International, Inc., Pew Center on Global Climate Change.

Barbaro, Michael, April 17, 2007, "Home Depot to Display Environmental Label," *New York Times*.

<http://www.msnbc.msn.com/id/18591849/>

[www.climateregistry.org](http://www.climateregistry.org)

[www.chicagoclimateex.com](http://www.chicagoclimateex.com)

[www.ghgprotocol.org](http://www.ghgprotocol.org)