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FEATURE

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Do you qualify? You start by answering yes to five simple questions.

By James Warner

While attending SWANA's joint Landfill Symposium and Planning & Management Conference in Nashville, TN, in June 2006, I stumbled upon a booth operated by the Chicago Climate Exchange (CCX). I had never heard of the CCX and was curious why it would be exhibiting at a SWANA event. As I would find out, it was the CCX's first-ever display at a waste management conference of any kind. I was quickly informed that the CCX is, as advertised, "the world's first and North America's only legally binding, rules-based, gas-emissions-allowance trading system, as well as the world's only global system for emissions trading on all six greenhouse gases (GHGs)." It provides a trading platform for a voluntary cap and trade program.

The goals of the CCX are

- to facilitate the transaction of GHG-allowance trading with price transparency and design;
- to build the skills and institutions needed to cost-effectively manage GHGs;
- to facilitate capacity-building in both public and private sectors to facilitate GHG mitigation;
- to strengthen the intellectual framework required for cost-effective and valid GHG reduction; and
- to help inform the public debate on managing the risk of global climate change.

While it all sounded very interesting, especially with all the noise surrounding the issue of global warming, I was trying to figure out what it might mean for the organization I manage ... the Lancaster County (PA) Solid Waste Management Authority (LCSWMA). Our organization owns and operates (with a few exceptions) a fully integrated solid waste management system that includes 1) a 1,200-ton-per-day mass-burn waste-to-energy (WTE) facility operated by Covanta Energy; 2) an active landfill permitted at 2,000 tons per day with a current intake

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averaging 1,100 tons per day; 3) a brand-new transfer station permitted at 2,200 tons per day with an average intake of 1,000 tons per day; 4) a new drive-through household hazardous waste (HHW) facility open each day; and 5) a landfill (closed in 1988) that is adjacent to our current landfill. The system manages approximately 580,000 tons in a typical year.

In addition to the above, our authority entered into a joint agreement in 2005 with PPL Energy Services LLP (the renewable-energy development arm of parent company PPL Corp.) to co-develop a landfill gas (LFG) project that would serve both the old landfill and the active landfill. The result of this joint effort was the construction and startup of a 3.2-MW LFG power plant using two Caterpillar 3520 internal combustion engines.

The LCSWMA invested \$1.5 million to install LFG well fields in both landfills, to install the LFG pipe-conveyance system, and to build a quarter-mile road to the site provided by the LCSWMA to PPL to construct the power plant. This facility came online officially on February 1, 2006.

LFG Project Qualification

Initial discussions with CCX representative Rob McAndrew led me to believe that a real opportunity might exist for our authority to actually sell carbon credits created from our recently established LFG project. The initial primary eligibility questions include the following, and if you can answer yes to all five, your LFG project might be eligible to be a GHG "offset project" with the CCX:

1. Was your LFG collection system installed after January 1, 1999?
2. Does your organization own the LFG collection system?
3. Does your organization have the legal rights to any offsets, allowances, or other environmental attributes related to the LFG emissions?
4. Was your LFG collection system installed voluntarily—i.e., in the absence of any regulatory requirement from the EPA or your state regulatory agency?
5. Are you destroying the LFG by flaring, internal engine combustion, etc.?

Many LFG projects fail to qualify based on their answer to question 4. But CCX eligibility rules state that "landfill methane collection and combustion systems in the US may be registered with CCX and may earn exchange methane offsets only for mitigation occurring during time periods for which the landfill was not required to collect and combust methane in accordance with US regulations requiring such actions under the New Source Performance Standards." In other words, the removal of LFG released to the environment must be voluntary and not driven by regulatory compliance.

Regulatory compliance is required when landfills meet all of the following criteria:

- Landfill maximum design capacity is greater than 2.5 million megagrams (approximately 2.75 million tons) or 2.5 million cubic meters (approximately 3.3 million cubic yards).
- Solid waste is in place for five or more years if the landfill is active or two or more years if the landfill is closed or at final grades.
- Annual non-methane organic compound (NMOC) emission rates are equal to or greater than 50 megagrams (approximately 55 tons).

The LCSWMA's landfill (old and current combined) exceeds two of the three criteria (1 and 2); however, given the characterization of wastes disposed at the sites, the calculated NMOC rate has never exceeded 50 megagrams. For example, NMOCs generated at the site in 2006 were calculated at 31.42 megagrams and are estimated to peak at 36.90 megagrams in 2021. It should be noted that all NMOC calculations must be completed in accordance with the procedures contained in 40 CFR, Subpart WWW of the Standards of Performance for Municipal Waste Landfills and, for CCX verification purposes, must be approved by the appropriate regulatory agency.

Full Membership Required

On July 19, 2006, within 30 days of our answering yes to the five questions listed at left, the CCX Offset Committee approved our LFG system as a qualified offset project. If our operations only included the landfill, we would have paid a \$1,000 fee to the CCX to register our landfill as an offset project at that point. However, the CCX looks at the profile of your entire organization and its operations. In our instance, we have carbon emissions from the diesel fuel we combust to operate our transfer fleet and from the approximately 360,000 tons of waste combusted at our WTE facility on an annual basis. If you have carbon emissions, you must join as a full-fledged member in order to also qualify your offset project. So our next effort was

to take the necessary steps to join the CCX as a member organization. As a CCX member, we would be required to make a voluntary but legally binding commitment to meet a GHG emission reduction target of 6% by 2010, or 1.2% per year. You have a choice in establishing your baseline of carbon output by using your year 2000 emissions or your average carbon output from 1998 through 2001.

The entire process of joining the CCX took about 60 days. On August 18, 2006, our board of directors approved a CCX membership resolution, as required by the CCX. We then submitted our official application for membership. On September 8, 2006, we received a Phase II Member Compliance Analysis along with a commitment letter that we would be required to sign. The compliance analysis contains an estimate of your carbon outputs from 2006 through 2010 measured against your required baseline reduction commitments. This gives you an immediate idea of whether or not you will be in a position to sell exchange allowances or need to buy them in order to meet your reduction schedule (1.2% per year from baseline in our case). On October 16, 2006, our membership received final approval and 356 carbon financial instruments (CFIs), representing 35,600 metric tons of carbon-dioxide equivalents, were put into our project offset trading account. Our authority was the first public sector environmental organization to join the CCX.

Compliance Position

As mentioned above, we needed to establish a baseline to determine our actual position or whether we would have exchange allowances to sell or whether we would need to buy them in order to meet our carbon output reduction targets of 1.2% per year from our baseline.

Emissions calculations must be done under globally recognized and established protocols from the World Resources Institute (WRI) and the Intergovernmental Panel on Climate Change (IPCC). For MSW combustion, a factor of 0.557 metric ton of carbon dioxide per metric ton of MSW combusted is used. For diesel combustion, a factor of 0.01039 metric ton of carbon dioxide per gallon is used. Using the factors and average emissions from 1998 through 2001, our baseline for total carbon dioxide emissions was 197,426 metric tons. Our actual output of carbon dioxide for 2006 was only 180,949 metric tons, an 8.3% reduction from the baseline, meaning we have already exceeded our 2010 mandatory reduction requirement of 6%. Our output reduction certainly was not intentional, but instead was the result of less waste going through our WTE facility due to higher Btu values and a small reduction in boiler availability. So for 2006, we have already booked 14,108 exchange allowances (carbon credits) that could be sold. Our strategy will be to bank these credits at least for the next few years, just in case our future projections are wrong and we would need them to meet our reduction requirements in years 2009 or 2010, although we think that is unlikely to be the case.

Verification

As part of our carbon offset project registration, the CCX requires participants to hire one of its prequalified independent verifiers. These firms will verify that, in fact, all your "yes" answers to the five questions listed previously are true. They will then also review all gas flow and methane content records used to calculate actual metric tons of methane destroyed. The CCX uses a factor of 18.25 metric tons of carbon dioxide for each metric ton of methane destroyed. All data must be verifiable, and gas flow meters must be calibrated on a regular basis.

Our LFG project started on February 1, 2006. Our verifying agent chose August 18 as the cut-off date for data. Between those two dates, it was verified that the LFG project destroyed 1,950.7 metric tons of methane. Using the multiplier of 18.25, this was then calculated to be 35,600 metric tons of carbon-dioxide equivalents. As mentioned, the trading instrument is a CFI that consists of 100 metric tons of carbon-dioxide equivalents.

Therefore, after all the verification was completed, 356 CFI contracts were put into our trading account for our offset project. The process to verify the membership compliance analysis, which reviews your actual carbon-dioxide output against your established baseline, is a totally separate activity and would not be completed until March 2007, due to the need to have complete 2006 actual data.

Trading

The commodity traded at the CCX is the CFI contract, each of which represents 100 metric tons of carbon-dioxide equivalents. CFI contracts comprise exchange allowances and exchange offsets. Exchange allowances are issued to emitting members in accordance with their emission baselines and their emission reduction schedules. Exchange offsets are generated by qualifying offset projects. In our case, we will have both.

The actual trading platform is very sophisticated yet uncomplicated. CFIs are traded in "vintages" that include the years 2003 through 2010. For example, the carbon-dioxide

equivalents we generated through LFG destruction in 2006 are 2006 vintage. Within the trading platform, there are "bids" (those wanting to buy) and "offers" (those wanting to sell) for a certain price for each vintage. Just like stocks, the difference between the bid/offer is known as the "spread." Most transactions take place within the spread. A seller can always guarantee its desire to sell if it is are willing to sell at the listed bid (this is the same as a market order in stocks). However, selling at the bid can have a negative impact on the price of a CFI if it occurs often enough. Since the LCSWMA has been selling in this market, prices have ranged from a low of \$3.25 to a high of \$4.35 per metric ton. So one CFI contract sold at \$3.25 would yield \$325 in revenue (minus a 5-cents-per-ton commission).

Liquidity in the market can be spotty, as there have been some days where only a few transactions have taken place. But for the most part, our experience has been that there are enough willing buyers for us to sell what we are generating. The key to the market will be the continued balance of supply (sellers such as us) and the demand side ...the buyers.

Who are the buyers? They are CCX members who are buying to achieve their compliance reduction requirements, hedge funds that are buying CFIs with the hope of selling them in the future at a higher price, and associate member companies that buy CFIs and resell them to the general public under programs to "neutralize your carbon footprint" ... such as for air travel.

We currently have a designated senior manager who does our trading and will try to sell approximately 1,500 metric tons (15 CFIs) per week. This amount is close to what we are generating on a weekly basis from the LFG project based on current gas flows. This is only a general guideline, and actual selling may be influenced by market conditions. As a public agency, our trading goal is to slowly sell at what the market will give (more like dollar cost selling). We are not speculating the market, such as saving all of our credits hoping for the price to go much higher before selling. When a trade is made, settlement is usually made within 24 hours with the funds wired by the CCX directly into our bank account the following business day.

Revenue

Going into 2007, we decided to be conservative in our budgeting, having little experience with the CCX market or process during budget time in September 2006. We first projected that 3,506 metric tons of methane would be destroyed at our LFG project. This translated to 64,000 metric tons of carbon-dioxide emission credits for our trading account, and we projected an average sale price of \$3 per metric ton. This yielded a revenue expectation for FY2007 of \$192,000.

As it stands, we now expect to make about \$300,000, mostly because of higher carbon credit prices, which have ranged between \$3 and \$4 per metric ton thus far during 2007.

Predicting long-term future revenue is a guess. While we can predict the amount of carbon credits we may generate in a year with some accuracy (due to both consistent LFG flows and methane percent), it is anybody's guess where the value of the credits will be. What is certain is that joining the CCX has been a small financial windfall for our organization. So far, we have netted \$203,012 from selling our credits. While this amount is small compared with the authority's total annual budget of \$53 million, it is gained with little effort. With an average price of \$4 per metric ton, our entire \$1.5 million investment in our LFG system will be paid for by 2009.

It needs mentioning that our authority never expected any return on its voluntary LFG collection installation, as it was done for the environmental enhancement of the landfill site in general.

Fees

Our fee requirements to join the CCX have been modest when compared with the revenue we have made. Fees have included the CCX membership initiation fee (\$5,000); the full membership annual fee (\$5,000); and the offset project verification costs (\$4,750) for a subtotal of \$14,750. Future costs will include membership through 2010 (\$20,000) and quarterly carbon-dioxide offset verifications (\$32,000) for a subtotal of \$52,000. The total estimated five-year cost, then, is \$66,750.

With a total outlay potential of only \$67,000, we have already made three times this amount, with four more years of revenue to be gained.

In closing, the CCX has certainly been a worthwhile venture for us. Our membership has not only created an additional revenue stream but it has also brought some nice positive environmental publicity for our authority. The future of GHG is taking shape right before us.

Wall Street has certainly taken notice, and many firms have announced they will be investing billions in GHG programs in the future. Where the CCX will be when everything settles in the next three to five years is uncertain, but we are certainly fortunate to be involved in some small part along the way.

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