

# Volunteering to fight global warming



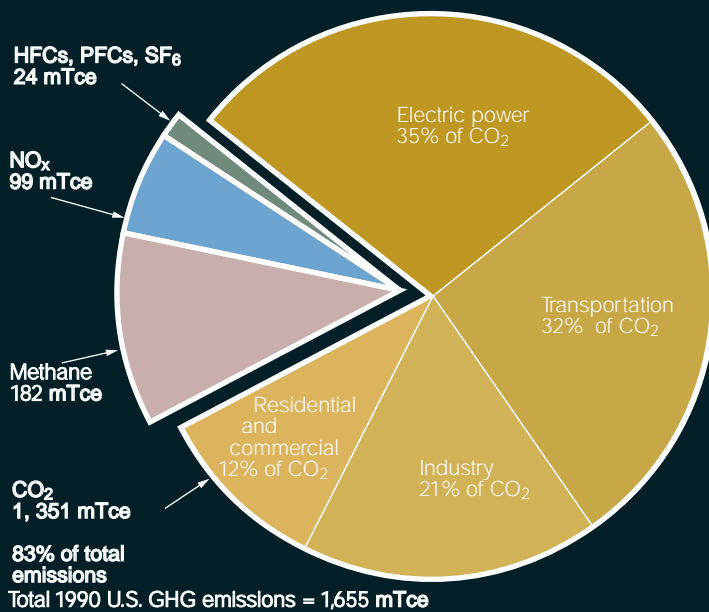
Most energy companies know that governments will—sooner or later—impose limits on their emissions of greenhouse gases. A small but growing number—including two oil majors and some big U.S. utilities—are already preparing for the inevitable. They are taking voluntary steps to reduce the amounts of CO<sub>2</sub> and pollutants their activities generate, and experimenting with market-based and internal programs for trading emissions credits for multiple greenhouse gases. Such proactive approaches do more than lend needed certainty to corporate environmental planning; they also promise to give their 'green' adopters a competitive edge, in the form of early practical experience with emissions measurement and trading and compliance risk management

**G**iven lingering doubts that global warming is a real problem, and growing pessimism that the Kyoto Protocol will be the vehicle for solving it, why would any energy company take steps to begin reducing its emissions of greenhouse gases (GHGs) now? At this early stage of the policy debate, doesn't it make more sense to wait and see what governments will demand of industry than to invest in costly reduction efforts that may prove misguided or unnecessary later?

BY  
ANNE KU

Not necessarily, say some companies through their actions. The global energy industry has already begun to cut its output of GHGs—voluntarily. In the U.S., many bottom-up, proactive efforts are under way, despite the Bush Administration's recent rejection of the Kyoto Protocol and the absence of mandatory targets for reduction of CO<sub>2</sub>—which constitutes 80% of GHG emissions—on the horizon. Elsewhere, the first

## 1. U.S. greenhouse gas emissions in 1990 (million tons of carbon equivalent, mTce)



Source: U.S. Department of Energy, Energy Information Administration, Emissions of Greenhouse Gases in the U.S., 1999

two trans-Atlantic exchanges of CO<sub>2</sub> emissions credits were recently announced, and several kinds of markets for trading them are being set up in European countries.

### New approaches from the Old Country

Environmentally conscious Western Europe is weaning itself off nuclear power, and seems eager to treat fossil-fueled electricity and combustion engines with equal disdain. A voluntary carbon trading scheme—which notably does not include power generators—begins in Great Britain next year. Denmark plans to use “green” certificates for trading GHG emissions credits. And the European Community wants to have CO<sub>2</sub> trading across the EU by 2005.

The U.K. Emissions Trading Scheme is voluntary to join but is binding for 10 years. The British government offers financial incentives to get businesses to participate. Participants must meet absolute emissions targets, with

the levels based on past emissions. The scheme excludes electricity generators as they are already covered by the Climate Change Levy (a tax on energy use) and the Renewable Obligation (a requirement to purchase a certain proportion of electricity from designated renewable sources). The first target compliance period is scheduled to begin in April 2002.

The world’s first national CO<sub>2</sub> emissions trading scheme was established in Denmark. This cap-and-trade program applies to large power producers, requiring them to meet specified emissions targets or be penalized at 40 Danish kroner per tonne of CO<sub>2</sub> (equivalent to \$4.55/tonne CO<sub>2</sub>).

The EU’s proposed scheme for CO<sub>2</sub>

credit trading, announced in May, is a response to U.S. criticism that Europe lacks markets for buying and selling GHG credits. The proposal anticipates the creation of private markets for trading CO<sub>2</sub> allowances—and CO<sub>2</sub> allowances only. It stipulates financial penalties that matter: Scofflaws will be charged a minimum of 200 euros for every metric ton of CO<sub>2</sub> equivalent over their government-assigned allowance that they allow to escape.

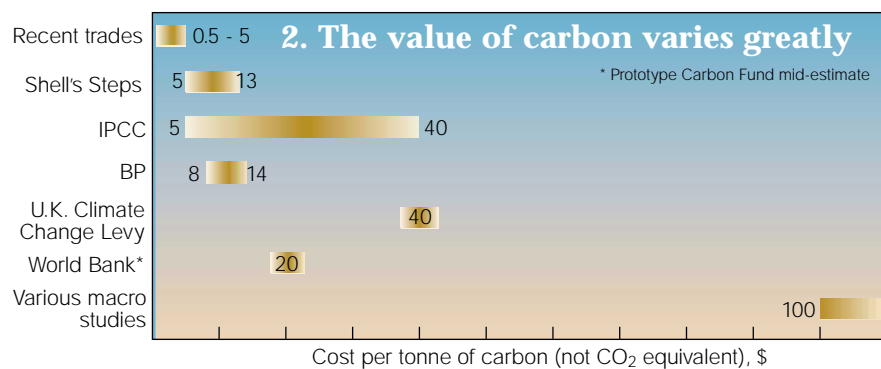
The EU says that it decided on the 200 euro figure because it is 10 times what the average price of allowances is expected to be, and because the penalty is sufficient to ensure that offenders actually reduce their emissions—rather than buying someone else’s credits. For more information on the EU’s policies and proposals, visit [www.europa.eu.int/comm/environment/climat/eccc.htm](http://www.europa.eu.int/comm/environment/climat/eccc.htm).

Such approaches seek to use markets to set the price of CO<sub>2</sub> emissions credits, much as the very successful mandatory SO<sub>2</sub> emissions allowances program in the U.S. created a “currency of clean air.” But a market isn’t necessarily needed to buy and sell credits; two companies with complementary CO<sub>2</sub> positions can do that on their own.

That’s exactly what two pairs of energy companies recently announced plans to do. The deals are significant not only because they are voluntary, but also because each involves a Canadian and a European utility. In the more recent one, announced this June, Calgary (Alta., Canada)-based TransAlta Corp. said it is buying 24,000 metric tons of CO<sub>2</sub> credits from electric utility HEW AG, Hamburg, Germany. HEW is reducing its emissions of CO<sub>2</sub> because it is now getting more electricity from windmills and less from fossil-fueled power plants. It

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## Corporate strategies



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says that the 24,000 tonnes are equivalent to the annual emissions from 3,000 cars.

In the press release announcing the deal, both sides are sanguine about what it portends. "This deal is part of TransAlta's ongoing commitment to reduce our net greenhouse gas emissions and lead the way in proving that market-based mechanisms—such as offsets and emissions reduction trading—really work," says Dr. Bob Page, TransAlta's vice president of Sustainable Development.

"The trading mechanism ensures that greenhouse gas reduction projects are carried out where they are most cost-effective," says Dr. Helmut-M. Groscurth, head of the project group on environmental certificates at HEW. "At the same time, emissions reduction trading is an interesting new field of business for HEW. It may very well complement HEW's newly developed energy trading activities."

The other deal, made last November and brokered by New York-based Natsource, was for an even larger amount of CO<sub>2</sub> reduction. According to the press release announcing it, Epcor Utilities Inc.—parent of Edmonton Power, Alta., Canada—"effectively purchased 50,000 tonnes of CO<sub>2</sub>

credits when [Finland's] Fortum Group made a fuel switch to biomass at its Joensuu power plant. The total annual decrease in [the CO<sub>2</sub> emissions from] the Joensuu plant is about 200,000 tonnes. The conversion of the plant's peat-fired boiler to be a fluidized-bed boiler made it possible to [raise the bio-fuel's share of the plant's fuel supply to] 50%. The trade concerned emissions reduction credits created in 2000 and transferred on [Jan. 31, 2001]."

"This transaction is a glimpse into the future of the global greenhouse gas market," notes Garth Edward, a broker at Natsource. "Epcor and Fortum have worked together to establish strong verification standards, exploring the legal basis of international transactions and raising awareness of how this market can deliver solid environmental benefits to the global community," he says.

### Oil majors set their own standards

The cash that Fortum pockets from sales of CO<sub>2</sub> credits isn't the main objective of its environmental cleanup efforts. The company's broader strategy is to prepare itself for the day when national CO<sub>2</sub> caps become mandatory and—in the process—help its

country reduce its collective emissions of the main GHG. With that goal in mind, Fortum plans to increase its use of both renewable and low-carbon raw materials and cut Finland's annual output of CO<sub>2</sub> by 300,000 to 500,000 tonnes by 2005.

Helping meet a national goal isn't a strategic option for multinational oil companies, however. Once individual countries set or commit to meet a national CO<sub>2</sub> target, companies with international operations will have to comply with dozens of local regulations. Rather than face such uncertainty and confusion, two of the oil majors—BP and Royal Dutch/Shell—are preparing to impose internal caps on their corporate emissions of CO<sub>2</sub>.

Such preparations take time. In September 1998, Sir John Browne announced that BP would reduce the company's GHG emissions by 10%—based on 1990 data—by 2010. To get started, BP set up an internal emissions trading system in which its business units would have to participate. The intention was to allow the units to find innovative and cost-effective ways to reduce their production of GHGs.

As part of the initiative, BP commissioned external, independent auditors to measure how much CO<sub>2</sub> each of its business units produces, and establish a process for verifying reductions. The first audit—in 1998—looked at 127 individual business units in three of the company's business streams: upstream, downstream, and chemicals. It showed that eight business units accounted for 40% of BP's total GHG emissions, and that 40 units accounted for 80% of emissions. A later audit, in 2000, examined the company's fourth business stream—gas and power.

Although these measurements are useful to BP in and of themselves, what the auditors have concluded about verifiability is even more significant. They say that given the absence of national or international GHG measurement and reporting standards, business units can pick from several methods. However, if different units

choose different methods, that would make comparisons of their CO<sub>2</sub> reduction efforts as useful as comparisons of apples and oranges. But over time, a “best practice” should emerge from improvements in the auditing process.

The other oil major planning to voluntarily reduce its emissions of GHGs is Royal Dutch/Shell. The company’s Web site states, “The Shell Group aims to reduce its greenhouse gas emissions from 1990 by more than 10% in 2002. The longer term is less predictable, but Shell aims to continue to exceed the Kyoto target by 2010. This commitment will be met by reducing greenhouse emissions from our own operations and we will also help our customers to reduce theirs, mainly by providing them fuels with a lower carbon content and by offering renewable energy choices.”

In January 2000, Shell launched an internal GHG emissions trading system called Shell Tradable Emission Permit System (Steps). It resembles the “cap and trade” system developed for SO<sub>2</sub> by the U.S. Environmental Protection Agency (EPA). Steps has three objectives: (1) to demonstrate the feasibility and merit of international emissions trading as a low-cost way to reduce emissions; (2) to gain valuable, practical experience in emissions trading, particularly if used in compliance regimes; and (3) to identify least-cost opportunities for emissions reduction by Shell when compliance becomes mandatory. One of the goals of this initiative is to discover the true costs of abating GHG emissions.

Unlike BP and Shell, Exxon Mobil has made no public commitment to reducing its GHG emissions. Its reticence is in line with its corporate position on climate change: “We do not believe that the current scientific understanding justifies mandatory restrictions on the use of fossil fuels, and we are certain that large economic harm would result from reducing fuel availability to consumers by the adoption of the Kyoto protocol or other mandatory measures.” When asked to clarify the company’s stance on CO<sub>2</sub>

## How the Los Angeles ACE/Reclaim program works

The Automated Credit Exchange (ACE) emissions market opened for trading on Earth Day 1995 (April 13). Designed to support the commerce of the Los Angeles Reclaim (Regional Clean Air Incentives Market) program, ACE was also the first Internet-based exchange in the world. By the late 1990s, it had become the dominant vehicle for commerce of the Reclaim program, a status it maintains to this day. Developed by two small California firms, Pasadena-based Sholtz & Associates and San Diego-based Net Exchange, ACE exemplifies how a new market can succeed when it serves the needs of those whose commerce it transacts.

In 1992, the Los Angeles-area South Coast Air Quality Management District (SCAQMD) decided on a market-based approach to help local companies comply with the Clean Air Act Amendments of 1990. Industrial emissions of NO<sub>x</sub> and SO<sub>x</sub> in the area were required to decrease by 80% by 2010. To make it possible to achieve such a large reduction, SCAQMD established the emissions credits as single-year issues—in other words, a 2003 credit could only be used to offset a pound of pollution emitted in 2003. The SCAQMD then distributed credits, for all years of the program, totaling all allowable emissions, to the industrial emitters that existed in 1992. Any new firms setting up business in the region would have to buy credits from those firms that had been given credits in 1992.

Conventional brokerage was the first market process attempted for these

credits, but it soon became clear that the credits’ short term rendered brokerage unworkable. One reason is that although the credits are good for only one year, emissions reduction programs require long-term financial decisions. Another is that the credits must be bought or sold in multi-year packages to serve the needs of the industrial emitters.

Finding a single counterparty for a package trade is difficult if not impossible, and the low liquidity of the market deters a broker from acquiring an inventory through which package deals can be transacted.

The ACE market was then designed to transact multi-year packages of credit assembled from the multi-year expressions of interest among many firms. It uses the principles of combinatorial trading, a form of market process that takes into account the reality that most commerce is multilateral and multi-item. A market that uses this process requires no intermediary to acquire any transition inventory. Further, long-term deals are not static; for example, a multi-year package of emissions credits acquired in 2001 can be rebalanced sometime later by re-entering the market with a multi-year order that seeks to adjust a firm’s holdings in consideration of new information.

For more information about the ACE/Reclaim market, visit [www.acemarket.com](http://www.acemarket.com). For more information about the broader application of combinatorial trading processes, visit [www.nex.com](http://www.nex.com).

—Charles Polk is president of Net Exchange, San Diego

credit markets and deals, a company representative responded that “Exxon Mobil generally disagrees with premature implementation strategies of the Kyoto protocol, like emissions trading to ration energy use.”

The representative added that because 87% of GHG emissions produced by combustion of oil and gas come from the daily use of petroleum products by consumers, it makes more sense for Exxon Mobil to focus its environ-

### Greenhouse gases

Gas	Description	GWP*
Carbon dioxide (CO <sub>2</sub> )	Comes from the decay of materials, respiration of plant and animal life, volcanic and thermal venting, and natural and human-induced combustion of materials and fuels. It is removed from the atmosphere through photosynthesis and ocean absorption	1
Methane (CH <sub>4</sub> )	A more effective heat-trapping gas, methane is produced by the anaerobic decay of matter. Primary sources include wetlands, rice paddies, animal digestive processes, fossil-fuel extraction, and decaying garbage	21
Nitrous oxide (N <sub>2</sub> O)	Soils and oceans are the primary natural source of N <sub>2</sub> O. Humans contribute to its production through soil cultivation, the use of nitrogen fertilizers, nylon production, and the burning of organic material and fossil fuels	310
Halocarbons (HFCs, PFCs)	Man-made chemical compounds containing members of the halogen family (bromine, chlorine, and fluorine) and carbon. They are some of the most effective heat trapping greenhouse gases of all. Most are already regulated under the Montreal Protocol for protecting the ozone layer. But they also would be regulated by the Kyoto Protocol because they contribute to global warming	140 to 11,700
Sulfur hexafluoride (SF <sub>6</sub> )	SF <sub>6</sub> is emitted by circuit breakers, gas-insulated substations, and switchgear. Electric power equipment generates a significant percentage of the 6,500 to 7,500 metric tons of SF <sub>6</sub> produced worldwide each year	23,900

\* GWP = Global Warming Potential, the effect on climate change relative to a similar amount of CO<sub>2</sub>. Source: CO<sub>2</sub>E.com

mental efforts on technology R&D in the transportation and other sectors. Examples include a joint effort with Toyota to develop advanced automobile engines, and another—with Toyota and General Motors—on fuel cells. Both projects aim to lower the GHG emissions of cars in the future.

### American CO<sub>2</sub> reduction initiatives

Europe and the developing world are still upset that the new Bush Administration rejected the Kyoto Protocol this past winter. They consider the President's explanation—"I won't do anything to hurt the U.S. economy"—disingenuous because they know that America puts more carbon into the atmosphere per capita than any other country in the world. Where should blame for this be directed? As Fig. 1 shows, the electric power industry produces more than one-third of overall U.S. emissions of CO<sub>2</sub>. Nearly 82% of those emissions come from

coal-fired power plants.

Is there a viable and economically benign solution to this problem? In a recent multi-client assessment of a carbon policy that would require generators to reduce their CO<sub>2</sub> emissions to 1990 levels, the energy strategy practice of ICF Consulting, Fairfax, Va., concluded that such a policy would have significant economic impact. For example, it might require that operators of coal-fired plants shift from base-load to intermediate service, and/or switch to burning natural gas. However, the assessment also concluded that it is indeed possible—through international trading or other market mechanisms spelled out by the Kyoto Protocol—to design a program to meet CO<sub>2</sub> reduction targets.

Although electric utilities are used to complying with air pollution regulations, meeting GHG emissions reduction targets is another matter. Neither the U.S. nor most other countries characterize CO<sub>2</sub> as a pollutant.

No downstream technology similar to SO<sub>2</sub> scrubbers or particulate collectors yet exists to remove carbon. Although improving combustion efficiency or switching to "cleaner" fuel helps, carbon reduction generally implies burning less fuel of high carbon content. The main reason that Great Britain's electricity sector emits less carbon than it used to is that it has switched from coal to natural gas.

U.S. power companies came to grips with this reality—and the public-relations problem it might cause—long ago. In 1994, utilities representing more than 70% of U.S. generating capacity enrolled in a voluntary carbon emissions reporting and reduction program under the so-called Climate Challenge. The program worked; in 1999, the industry reduced, avoided, or sequestered 124 million tons of CO<sub>2</sub>-equivalent GHGs. That program ended with the Clinton Administration, which started it. Many believe that future voluntary programs to reduce or offset GHG emissions could be just as successful.

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### CO<sub>2</sub>: Only one piece of the puzzle

Piecemeal legislation to reduce emissions prevents utilities from optimizing their planning strategies and investments. And it's difficult to optimize a

strategy for managing all pollutants if you don't know what's on the long-term horizon. Optimizing for all pollutants is better than tackling one at a time. Take mercury, for example. If you're not sure you'll have to reduce your emissions of SO<sub>2</sub>, then you'll invest in technology that just targets mercury. However, if you know that you'll have to cut your output of SO<sub>2</sub> as well, you'll buy equipment that handles both chemicals.

But a multi-pollutant approach needs to incorporate energy policy to avoid creating an energy crisis, as the ICF study suggests. Stringent requirements on carbon may force shutting down or retiring coal-fired plants prematurely. In an industry with long investment lead-times, companies want emissions targets to be firmed up as soon as possible for planning purposes.

In the U.S., two groups of energy companies have formed to emphasize the need to have such a multi-pollutant plan in place sooner rather than later. One is the Clean Energy Group, which wants to cap emissions of carbon, SO<sub>2</sub>, NO<sub>x</sub>, and mercury. Its members include Conectiv Inc., Consolidated Edison Company of N.Y. Inc., Exelon Corp., Keyspan Energy Corp., Northeast Utilities, Ontario Power Generation, Inc., PG&E National Energy Group, Public Service Electric Co., and Sempra Energy.

The other is the Clean Power Group, which not only favors multi-pollutant regulation, but also increased use of new technology for environmental improvement. Its five members are Calpine Corp., El Paso Energy Corp., Enron Corp., NiSource Inc., and Trigen Energy Corp. The group proposes that targets for reducing overall emissions replace current New Source Review (NSR) requirements that were established to force power generators to comply with the Clean Air Act Amendments of 1990. The NSR requirements were intended to ensure that every investment in a new power plant or improvement to an existing one

contributes to making the electricity sector cleaner than before. But Joel Bluestein, director of the Clean Power Group, says that the requirements haven't done much to improve the environmental performance of existing plants; he says they actually discourage plant operators from reducing their emissions and boosting their combustion efficiency.

### Green pioneer

Another energy company that favors comprehensive rather than piecemeal emissions targets—including one for CO<sub>2</sub>—is New Orleans-based Entergy Corp. However, the company has boldly chosen a different approach to becoming cleaner than its competitors and a different platform for lobbying for what it wants.

Entergy made front-page news this May when it became the first U.S. utility to pledge that it will voluntarily take actions to stabilize its domestic GHG emissions at year 2000 lev-

els by 2005. It also became the first U.S. utility to join the Partnership for Climate Action (PCA), a collaboration of international business and environmental leaders dedicated to climate protection.

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To meet its GHG reduction target, Entergy has allocated \$25 million for investment in projects for reducing emissions from its fossil-fuel-fired facilities. "Entergy's first priority is to reduce greenhouse gas pollution within our own operations. We expect to achieve at least 80% of the reduction in this way," explains CEO Wayne Leonard.

Working internally, Entergy will try to improve the efficiency of its power

### Proving that markets work

plants. But it will work externally as well. The company intends to engage itself in such projects as capturing methane gas leaking from coal mines, renewable energy projects that produce electricity without GHG emissions, carbon sequestration, and improving end-user efficiency.

Despite the success of the EPA-designed SO<sub>2</sub> allowances market in the U.S., some still wonder whether and how a similar market for CO<sub>2</sub> reduction credits would work in practice. Empirical evidence on that subject will become available, but not for a few years. Twenty-five companies and non-profit groups from the electric power, agriculture, and manufacturing industries have agreed to help design a new, interregional carbon trading market to be called the Chicago Climate Exchange. Participants include Ford Motor Co., DuPont Co., Suncor Ener-

It's difficult to optimize a strategy for managing all pollutants if you don't know what's on the long-term horizon. Optimizing for all pollutants is better than tackling one at a time. But a multi-pollutant approach needs to incorporate energy policy to avoid creating an energy crisis

gy, Alliant Energy Corp., Calpine, Cinergy Corp., NiSource, PG&E National Energy Group, Wisconsin Energy Corp., Pinnacle West Capital Corp., and Swiss Re.

Proposed by Chicago-based Environmental Financial Products LLC—a designer and developer of trading systems and tools for commodity, financial, and environmental markets—the exchange hopes to prove that voluntary trading of GHG credits could mitigate global warming and climate change. The standard of proof it has chosen is whether trading reduces the participants' GHG emissions, including CO<sub>2</sub>, by 5% below 1999 levels by 2005. Among the goals of the pro-

### Visit these Web sites for more information

<a href="http://www.climateark.org">www.climateark.org</a>	Portal containing news archive, links, directories
<a href="http://www.co2e.com">www.co2e.com</a>	Fairly comprehensive FAQ section on emissions trading and climate change
<a href="http://www.unfccc.int">www.unfccc.int</a>	What's new; Kyoto Protocol; events
<a href="http://www.pollution.com">www.pollution.com</a>	Portal with latest news on the environment and emissions
<a href="http://www.epa.gov/epahome/topics.html">www.epa.gov/epahome/topics.html</a>	U.S. Environmental Protection Agency's site
<a href="http://www.emissionstrategies.com">www.emissionstrategies.com</a>	ICF Consulting's dedicated site to information and tools for assessing SO <sub>x</sub> , NO <sub>x</sub> , and CO <sub>2</sub> emissions, free registration
<a href="http://www.environmental-finance.com">www.environmental-finance.com</a>	<i>Environmental Finance</i> , a monthly magazine
<a href="http://www.ieta.org">www.ieta.org</a>	A nonprofit organization dedicated to the establishment of effective systems for trading in GHG emissions by businesses
<a href="http://www.grida.no/climate/vital">www.grida.no/climate/vital</a>	Charts and figures of evidence and impact of global climate change
<a href="http://www.emissions.org">www.emissions.org</a>	Emissions Marketing Association
<a href="http://www.chicagoclimateX.com">www.chicagoclimateX.com</a>	Chicago Climate Exchange
<a href="http://www.globalclimate.org">www.globalclimate.org</a>	Global Climate Coalition; trade associations representing businesses, companies and corporations opposed to Kyoto Protocol and advocating instead for technology innovations and improvements to make fundamental changes
<a href="http://www.mjbradley.com/CEG.htm">www.mjbradley.com/CEG.htm</a>	The Clean Energy Group
<a href="http://www.natsource.com">www.natsource.com</a>	Natsource
<a href="http://www.epcor.ca">www.epcor.ca</a>	Epcor Utilities Inc.
<a href="http://www.fortum.com">www.fortum.com</a>	Fortum Group
<a href="http://www.transalta.com">www.transalta.com</a>	TransAlta Corp.
<a href="http://www.hew.de">www.hew.de</a>	HEW AG

posed exchange are to:

- Demonstrate that GHG trading can achieve real reductions in emissions across different business sectors.

- Get a better handle on the cost of reducing GHG emissions.

- Develop standard frameworks for monitoring emissions, determining offsets, and conducting trades.

The market is slated to initially comprise seven midwestern states (Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin) and expand geographically over time. Here's how it is supposed to work: Participating companies will be issued

tradable emission allowances. They can then either directly cut their emissions, buy allowances from companies that have achieved surplus reductions, or buy credits from agricultural or other offset projects—which could be overseas. Potential offset projects include renewable energy systems, such as wind and solar power, and those that capture and use agricultural and landfill methane. Offsets can also be generated by carbon sequestration projects—such as forest expansion and conservation soil management, both of which effectively remove CO<sub>2</sub> from the atmosphere.

What's missing from discussions of GHG abatement and CO<sub>2</sub> trading is a subject near and dear to energy companies now being forced to compete for profits—cost

### CO<sub>2</sub> trading goes on-line

Because the subject of GHG emissions reduction and trading is so new, energy companies need to be educated about it. One new, free-to-join Web site whose main purpose is practical education is CO<sub>2</sub>E.com, which is being touted by its founders—the broker Cantor Fitzgerald and the accounting firm PricewaterhouseCoopers—as a “global hub for carbon commerce.”

CO<sub>2</sub>E.com is designed to be both a marketplace and a resource for information about carbon trading. It includes:

- A Web-based, broker-assisted marketplace for the trading of emissions reductions.

- A daily news service.

- Briefings and insights.

- A specialized search engine.

- On-line business and trading tools.

- A global registry of recognized climate change international consultants and experts.

Carlton Bartels, the site's president and CEO, explains that “what's intriguing about [climate change] is that corporations realize it is an issue, that [it's inevitable that GHG reduction will become mandatory], and that they cannot avoid getting involved. But their individual solutions to the problem must be flexible and friendly to them. And what that suggests is market-based trading, because it gives you the widest selection of opportunities. Procrastinating will only increase your risk exposure.”

To support his argument, Bartels emphasizes that all emissions-credit markets in the U.S. have been successful—with the possible exception of California's ACE/Reclaim program (see box), which has been affected by the power crisis there.

### The cost of cleanliness

What's missing from the above discussions of GHG abatement and CO<sub>2</sub> trading is a subject near and dear to energy companies now being forced to compete for profits—cost. Companies need to know their cost of reducing emissions, explains Abyd

Karmali, vice president of the Carbon Asset Management Practice at ICF Consulting. They can either pay to reduce their emissions themselves, or buy credits from another company that has done so at its facilities. Whether or not the Kyoto Protocol gets ratified, Karmali says, companies must approach emissions reductions as they do the other assets and liabilities on their balance sheet. To be successful, he adds, an effective carbon risk management strategy must be an integral part of the company's overall business plan.

Karmali advises companies wishing to get a head start on carbon risk management to:

- Assess their GHG emissions risks and benchmark their carbon intensity against peers in their sector.

- Calculate their marginal cost of abatement, and analyze their external emissions reductions to take advantage of arbitrage opportunities.

- Perform a "value at risk" assess-

ment to better understand how the issue of climate change bears on other elements of corporate strategy.

- Recognize that taking action to mitigate climate change is increasingly being viewed—particularly in Europe—as a key indicator of a company's social responsibility.

### No time to lose

The latest reports from the Intergovernmental Panel on Climate Change (IPCC) and the U.S. National Academy of Science contain overwhelming evidence that global warming is indeed occurring, and affirm that human activity contributes to it. But a growing number of energy companies haven't needed overwhelming proof to take action.

Realizing that national carbon-reduction targets will eventually be imposed, and that governments will demand that their industries help meet them, these early adopters are preparing for the inevitable. By mea-

suring their CO<sub>2</sub> emissions and finding out what it will cost to reduce them, they are positioning themselves to compete on another business front. What Entergy and the energy companies that join entities like the Clean Energy Group and the Clean Power Group are demonstrating is that they realize that the cost of compliance will only grow the longer you do nothing.

Finally, executives looking to make the business case for reducing their company's GHG emissions might do well to reflect on how much good press Entergy's May announcement generated. Energy companies routinely spend millions of dollars for a catchy new name. Who's to say that making incremental investments of similar size now in programs that will surely become necessary later, and—more significantly—improve the company's environmental reputation, doesn't make excellent business sense? ■

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