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CORRECTION TO THIS ARTICLE
An April 9 article on Page One incorrectly said that FedEx is among the growing number of companies that have backed a variation of a cap-and-trade system for limiting greenhouse gas emissions. It is not.

Europe's Problems Color U.S. Plans to Curb Carbon Gases

By Steven Mufson
Washington Post Staff Writer
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Wout Kusters, director of a manufacturing plant in the Dutch lowlands, knows something the U.S. Congress needs to know. So does Gervais Pruvost, a laborer in a small cement plant in northern France. So does just about every German homeowner.

When you're trying to slow down global warming, beware of unintended consequences.

As U.S. lawmakers work on the details of their greenhouse-gas legislation, they are looking carefully at Europe's experience. Five Senate proposals all use the same basic approach, known as "cap and trade," that Europe has used for the past two years. But what the snappy name "cap and trade" means is that the market will put a price on something that's always been free: the right of a factory to emit carbon gases. That could affect the cost of everything from windowpanes to airline tickets to electricity.

Europe has already hit a few bumps with its program. There's the Dutch silicon carbide maker that calls itself the greenest such plant in the world, but now can't afford to run full-time; the French cement workers who fear they're going to lose jobs to Morocco, which doesn't have to meet the European guidelines; and the German homeowners who pay 25 percent more for electricity than they did before -- even as their utility companies earn record profits.

In some ways, Europe's program has been a success. It covers 45 percent of the continent's emissions, 10,000 companies and 27 European Union countries. It has built registries that list carbon dioxide emissions for every major plant.

In other ways, the approach has been a bureaucratic morass with a host of unexpected and costly side effects and a much smaller effect on carbon emissions than planned. And many companies complain that it is unfair.

Consider the plight of Kollo Holding's factory in the Netherlands, which makes silicon carbide, a material used as an industrial abrasive and lining for high-temperature furnaces and kilns. Its managers like to think of their plant as an ecological standout: They use waste gases to generate energy and have installed the latest pollution-control equipment.

But Europe's program has driven electricity prices so high that the facility routinely shuts down for part of the day to save money on power. Although demand for its products is strong, the plant has laid off 40 of its 130 employees and trimmed production. Two customers have turned to cheaper imports from China, which is not covered by Europe's costly regulations.

"It's crazy," said Kusters, the plant director, as he stood among steaming black mounds of petroleum coke and sand in northern Holland. "We not only have the most energy-efficient plant in the world but also the most environmentally friendly."

A few hundred miles away, in northern France, Pruvost took to the streets with 400 other cement

workers from the region last December to protest a license for a rival company that plans to take advantage of Europe's system for controlling greenhouse gases by circumventing it. The rival wants to import material from Morocco, where factories don't have to pay to emit carbon gas.

Pruvost, 54, has worked for 30 years at a cement plant in the tiny town of Dannes in the gentle bluffs near the English Channel, as his father did before him. Looking for another job, Pruvost mused as he stood above a noisy giant mixing machine, would be "unimaginable." Though the potential rival factory has a permit, it has not started building the grinding facility it will need for the cheap imports.

Of all the effects of the new rules, the rise in the price of power has aroused the most outrage. Much of the anger of consumers and industries has been aimed at the continent's utility companies. Like other firms, the utilities were given slightly fewer allowances than they needed. But instead of charging customers for the cost of buying allowances to cover the shortfall, utilities in much of Europe charged customers for 100 percent of the tradable allowances they were given -- even though the government handed them out free. Electricity rates soared.

The chief executive of one utility, Vattenfall, which owns a coal plant that is one of the continent's biggest carbon emitters, defended the decision. Lars G. Josefsson, who is also an adviser to German Chancellor Angela Merkel, said higher electricity prices are "the intent of the whole exercise. . . . If there were no effects, why should you have a cap-and-trade system?"

But consumers ask why four big utilities that dominate the German market got to keep the money.

U.S. Pioneered System

The cap-and-trade system, modeled on a U.S. program that reduced sulfur dioxide emissions, sets a gradually shrinking target for Europe's carbon dioxide emissions and divides it by country.

Each country then rations shares to power plants and factories. The allocations are designed to fall short of past use, forcing companies to cut emissions, get credit for reducing greenhouse gases in developing countries or buy spare allowances from other firms to make up the shortfall. That creates a market, and a market price, for allowances.

However, because of lobbying by well-connected companies, the E.U.'s limits on emissions ended up being higher than the actual emissions. As a result, fewer companies than expected had to buy emissions this year, and the price of carbon allowances, which had topped $30 per ton of carbon about a year ago, crashed to about $1 a ton. That eased some of the pressure on electricity rates, but prices for next year, after tighter E.U. limits take effect, are still about $20 a ton.

The E.U. is drawing up new rules for a second phase of its program, due to run from 2008 to 2012, but those, too, have sparked controversy.

Fights have erupted as countries seek to guard their interests. Eastern European nations have lobbied for more generous allocations because of their communist legacies and lower living standards. Germany, the continent's largest wind-energy producer, wants an E.U. mandate that each country get 20 percent of its energy from renewable resources by 2020; Poland, which uses no renewable resources, is resisting.

Germany boasts that it has cut emissions to 18.4 percent below 1990 levels, the benchmark used in the Kyoto Protocol and in Europe. But nearly half the reduction was because of sagging industrial output in the former East Germany after reunification. For the 2008-2012 period, E.U. officials sliced 5 percent off Germany's emissions proposal.

Individual companies have also haggled over whether their historical records were representative emission benchmarks.

"A paper mill in Italy would get different credits from a paper mill in Germany, even if they are completely the same," said Marco Mensink, energy and environment director of the Confederation of European Paper Industries.

Perversely, Europe's cap-and-trade system has done little to reduce output at such places as the Janschwalde coal plant, Europe's third-biggest carbon dioxide emitter. Each year, it spews more than 25 million tons of carbon dioxide. The dirty gray plant still has turbines and generators that date from Soviet times. It has nine cooling towers, and just half of its output can power all of Berlin.

But the cap-and-trade system does provide an extra reward for efficiency. And the owner of the plant, the Swedish energy firm Vattenfall, installed new blades in the old Russian turbine, boosting the plant's efficiency to 36 percent, from 33 percent. Vattenfall has also retrofitted a 1,600-megawatt plant nearby at Schwarze Pumpe, which has a much higher efficiency rate.

At the other end of the transmission line, companies like Kollo live with the new rules as best they can. Each day, the silicon carbide plant's managers decide what they can afford to pay for electricity, and the utility tells them how many hours are available at that price. One day last month, the firm was told it could buy only 21 hours at the price it bid, so Kollo turned off the plant for three hours. That lengthens the 10-day manufacturing cycle and, contrary to environmental goals, reduces energy efficiency.

Starting in 2008, the E.U. will probably hand out allowances based on industries' best practices. The new standards, designed to eliminate disputed historical benchmarks, should favor efficient plants rather than grandfathering emission levels from inefficient ones.

Joost Demmink, Kollo's process manager, fears that the allocations will cover only half of what Kollo needs. If that happens, Kollo could spend about $1.3 million to cover the shortfall -- more than its profit in 2006.

Similar fears grip the French cement factory in Dannes, which is owned by Holcim. Vincent Bichet, the regional director general, said the company has cut energy costs -- and carbon emissions -- by using slag from steel plants or waste dumps and by reducing the amount of an energy-intensive material called clinker in its product.

But the new competitor may still undercut Holcim, Bichet said, because it doesn't have to pay carbon-emissions costs. The E.U. cap-and-trade system has led to a "distortion of competition" he said. "I've been yelling about this. What do you want me to do? Put a plant in Mauritania or Morocco and close this one?"

There's one more irony: The Moroccan clinker may have produced more carbon dioxide than clinker made in Dannes. "This is going the wrong way from an environmental point of view," Bichet said.

Lessons From Experience

Last week, a delegation of California state officials finished an eight-day tour of European capitals to figure out how they can learn from Europe's mistakes. And a week earlier, the Senate Energy and Natural Resources Committee held a roundtable discussion with half a dozen European executives, officials and consultants to figure out how to adapt Europe's system while avoiding some problems in the translation.

An increasing number of U.S. industry leaders -- including top executives of auto companies, FedEx, General Electric and major utilities -- have joined environmentalists in backing variation of a cap-and-trade system, and the Senate bills have bipartisan support.

One key issue is how to deal with imports from countries that don't price carbon. A U.S. system that raised costs for U.S. firms would make imported goods, especially from India and China, even more

competitive, adding to the trade deficit and possibly driving U.S. companies out of business. But, for now, demanding that China act on greenhouse gases is a non-starter, and waiting for Beijing could be an excuse for inaction, proponents of U.S. legislation say.

Other questions include whether emission permits should be given away or auctioned off. Should the system cover airlines and automobiles as well as factories? Should quotas be imposed when fuels are burned or when they are extracted from the ground?

"People in Washington have begun to focus on the cost of climate change," said Paul Bledsoe, strategy director at the National Commission on Energy Policy. "But it's important to recognize that legislation to mitigate climate change is going to have significant economic costs, as well."

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