

## Buy High, Sell Low

*Congress tries to get cash out of a faulty oil reservoir*

When the bombs began falling on Iraq early on the morning of January 16, 1991, the country controlled 10 percent of the world's oil production. Oil prices responded by edging downward. After all, there was plenty of excess capacity in nearby Saudi Arabia.



**PIPELINE** at Weeks Island in Louisiana will be used to transfer 70 million barrels of crude oil.

Oh, yes, there was one more thing. The U.S. government announced that it would sell, for the first time ever, oil from its strategic petroleum reserve (SPR). Some 34 million barrels of crude were offered, but there was so little worry by this time that only about a third of it was actually purchased. Five years after that brief and not quite shining moment, the SPR is enmeshed in bureaucratic and political controversy.

Conceived at the height of the oil embargo in 1973, the SPR is a collection of underground reservoirs that store a total of 590 million barrels. The main purpose of the reserve is to keep oil prices from skyrocketing in the event of another crisis. The U.S. consumes about 14 million barrels of crude oil a day, of which about half must be imported.

The current controversy stems from the discovery, in 1992, that water is leaking into one of the SPR's reservoirs, at Weeks Island in Louisiana. Concerned that the water might eventually push oil out into the surrounding marsh, the U.S. Department of Energy began in October to drain the 70 million barrels at Weeks Island and to transfer them by pipeline to two other sites.

To pay for the move, which is expected to cost about \$105 million, the DOE said it would sell seven million barrels of the Weeks Island crude at the going rate—about \$15 a barrel. Apparently some members of Congress then began

to see the SPR in a whole new light. The Senate Budget Committee proposed selling all of the oil, to raise money for the U.S. Treasury. In September the Senate Energy Committee recommended selling 38 million barrels to cover a shortfall that opened up in the DOE budget.

"They all somehow got the notion it's a cash cow, and they can sell it off any time they need money," fumes Congressman W. J. (Billy) Tauzin of Louisiana. Tauzin notes that the oil to be sold at \$15 a barrel was purchased by the DOE for much more. It cost roughly \$29 a barrel, according to a DOE spokesperson. With the effects of inflation and the expenses of facilities and labor figured in, the total amount spent by the DOE on the oil per barrel shoots up to \$56.

Nevertheless, some observers argue that the price of maintaining the oil each year—about \$200 million, the DOE reckons—is a loss that should be cut now. "We're using a very expensive weapon to accommodate a relatively minor problem," says William L. Fisher, a geologist and petroleum expert at the University of Texas at Austin.

## Some Like It Hot

*Thriving tunicates may help clear the air of excess CO<sub>2</sub>*

How quickly will the world warm? The question is as difficult as it is important. To come up with an accurate answer, scientists have to figure out how the myriad intertwined cycles that regulate the earth's life and climate are reacting to increasing amounts of carbon dioxide and other greenhouse gases that humans are releasing into the atmosphere. One major source of uncertainty is a "missing sink": undiscovered dead ends in the carbon cycle that researchers estimate pull roughly two billion tons of carbon (plus or minus about two billion tons) out of circulation every year.

Scientists searching for the sink have focused mainly on forests and other plant life on land that inhale carbon dioxide. But recent reports from marine biologists at Rhodes University in South Africa suggest that gelatinous, tubelike animals called salps may also be responsible for a portion of the missing carbon. If the complex and dynamic

Of course, the mother of all oil crises could be but a few years away. Robert A. Speir, a senior policy analyst at the DOE, notes that a 1990 U.S. government interagency study found that a major, worldwide oil disruption lasting six months could set the U.S. back \$100 billion in escalated oil prices.

Around Weeks Island, meanwhile, environmentalists fear a much different kind of disaster. After the oil is drained from the reservoir there, which is actually a former salt mine, the empty cavern is to be filled with brine. In theory, the brine's high salinity will keep it from dissolving, weakening and cracking the salt-lined walls of the shafts. But if fissures do develop, for example, after the oil has been removed but before the brine is pumped in, they could release the relatively high salinity brine and oil residues into a nearby marshy ecosystem that now supports crab, shrimp and other fisheries. "They [DOE officials] don't seem to be willing to step forward and accept liability for the long-term monitoring of the site," complains Wilma Subra, a chemist and environmental consultant in New Iberia, La.

Richard D. Furiga, DOE deputy assistant secretary in charge of the strategic petroleum reserve, says the department expects to have the brine-filled mine "certified as being stable and environmentally sound. We are complying, and will comply, with state laws governing things like this." —Glenn Zorpette

These zooplankton are important for what they eat—and excrete. Salps rise to the surface to graze all day on phytoplankton, tiny plant particles that draw carbon dioxide from the air for their photosynthesis. At night, the salps return to the depths as much as a kilometer below. There they dump the refuse of a day's work: fecal pellets that, Perissinotto describes enthusiastically, "are very rich in carbon and are very compact and fast-sinking. In fact, the pellets can sink at a speed of up to 2.7 kilometers per day!"

"What this means," explains Christopher D. McQuaid, director of the Southern Ocean Group at Rhodes, "is that where there are salps, the efficiency of the transfer of carbon from the atmosphere to the deep sediments—what we call the biological pump—is improved dramatically." Once buried on the seafloor, the carbon is out of the system for millennia. Because salps seem to proliferate as water temperatures rise, the biologists think they may provide a



RENZO PERRISINOTTO/Rhodes University

**SALPS like global warming—but may help slow its effects.**

kind of feedback mechanism. "So basically," McQuaid says, "it might work like this: more CO<sub>2</sub>, more warming, more salps; more efficient carbon transfer, less CO<sub>2</sub>, less warming."

Reality may well be more complicated than that simple hypothesis. "Salps are ideal grazers for removing carbon from the atmosphere," says Laurence P. Madin of the Woods Hole Oceanographic Institution. "The question is whether

there are enough of them. My experience sampling much of the Atlantic is that there are large areas where salps are present but not very abundant."

Moreover, the Rhodes researchers have observed that too much of a good thing can be lethal to salps. When phytoplankton in the water gets unusually dense—a condition that might be more frequent as CO<sub>2</sub> levels rise—the mucus net that a salp uses to strain plants from the water can clog the animal's digestive tract. "We've seen the salps starve to death literally *because* they are in the midst of plenty," McQuaid says.

The biologists note that it will take much more research to determine with any accuracy how this ecosystem will respond to—or affect—rising CO<sub>2</sub> and water temperatures. Of course, there may be hundreds of other cycles, biological and chemical, that will have greater impact. Perhaps the most pertinent question about global warming is: Can we expect an answer in time to do anything about it? —*W. Wray Gibbs*



## THE ANALYTICAL ECONOMIST

### The Confusing Price Index

After more than a decade of single-minded focus on battling inflation, the industrial world's central bankers—particularly in the U.S.—have throttled back average annual price increases from 10 percent a year to less than three. The cost in jobs and economic growth has been painful, and now policymakers are arguing whether achieving zero inflation is really a good idea. Complicating their debates is the oh-so-minor technicality that widely used statistical tools such as the consumer price index (CPI) probably aren't accurate enough to determine whether prices have stopped rising.

The CPI measures how much more (or less) it costs to buy a particular "market basket" of goods today, as compared with previous times. Surveyors for the U.S. Bureau of Labor Statistics (BLS) sample prices every month. If everyone in the country bought the same products (from toilet paper to insurance) in the same proportions, that would be fine. They don't. As a result, the CPI is subtly skewed, explains Stephen G. Cecchetti of Ohio State University.

Although the BLS has managed to compensate for some of these distortions, the adjustments it makes introduce errors. Cecchetti and his collaborator

Michael F. Bryan of the Cleveland Federal Reserve Bank found, for example, that inflation "rises" between January and April because adjustments intended to smooth out well-known jumps—such as new car prices in the fall and clothing in the spring—don't always succeed.

The two have developed techniques for correcting this flaw, but a multitude of other, less tractable problems remain. Substitution bias, for instance, arises when people change their purchase habits in response to shifting prices: if beef goes up, buy chicken; if fresh vegetables are too expensive, buy frozen. Economists such as Michael J. Boskin of Stanford University say the CPI overstates inflation because it ignores tactics consumers can use to soften the impact of local price hikes.

Boskin chaired a congressional commission that studied the CPI; he and his colleagues pointed out that the fixed "market basket" approach has trouble accounting for new or improved products. Personal computers, for instance, are so much more powerful today that it might be impossible to buy a machine that performs as slowly as one built 10 years ago. The introduction of high-tech products, such as microwave ovens or

VCRs, also muddies inflation measurements: How does one compare overall welfare now to that of an era when such gadgets did not exist?

On the other hand, some other qualitative changes may cause the CPI to understate the amount of money needed to maintain living standards. As Boskin notes, if crime forces people to spend more on burglar alarms, they may consider themselves less well off even if the price of security equipment is falling.

Such arguments may appear increasingly arcane, but the amount of money at stake is substantial. Social Security, taxes and a host of other government payments and levies are all indexed to account for inflation. Every percentage point by which the CPI increases will add \$140 billion a year to the deficit by 2005, forecasters say. Cecchetti is one of those who would not be averse to lopping a point off the index before using it to adjust government taxes.

A more principled approach to the issue would involve rethinking the CPI so that it more accurately reflects the quantity that policymakers want to measure. Although many economists (including Cecchetti) have developed alternative inflation measures that seem to do a more unbiased job, Congress is slashing the BLS's budget. The bureau will be hard-pressed to maintain its statistics, much less introduce new ones, laments James Stock of Harvard University. Indeed, if cutbacks continue, estimates of any future inaccuracies in the CPI will be difficult to come by, he says. —*Paul Wallich*