

# Portents of U.S. Oil Vulnerability

The recent three-year glut of oil in world markets — and the decrease in oil prices that it has fostered — have all but erased the 1970s Arab-oil embargo from memory. However, a new energy paper from the Washington, D.C.-based Worldwatch Institute warns against complacency. In it, the institute's Christopher Flavin cites data suggesting that the industrialized world may be no more than 10 or 15 years away from a dependency on Mideast oil producers — and their control of world oil prices — that rivals or surpasses any experienced in the mid-1970s.

The three factors most responsible for the oil glut that has released the Organization of Petroleum-Exporting Countries' (OPEC's) economic stranglehold over the developed world are an investment in energy conservation of unforeseen magnitude, a flooding of world oil markets with non-OPEC oil — most notably from Mexico and the North Sea — and the biggest global recession since World War II.

But these factors are not likely to persist, according to the report. Almost all the low-cost conservation measures that could be employed have been, Flavin says. Any additional conservation will come largely from investments that have already been made. Projections of an economic recovery also portend an increasing demand for oil.

Perhaps most important, as the table above shows, within 10 to 15 years the reserves of those major oil producers that have increased their output most to destabilize OPEC's market control — like the United Kingdom and Mexico — will be nearly exhausted. So too will U.S. reserves. And when that happens, Flavin says, OPEC's Mideast members could become more powerful than ever.

Ironically, he adds, today's relatively low oil prices tend to discourage investment in technologies that might reduce oil dependence 10 years from now.

"[Flavin's] thesis is a generally sound one," says Barbara Kates-Garnick, research director at Cambridge (Mass.) Energy Research Associates. William Quandt, a senior fellow at the Brookings Institution in Washington, D.C., adds that Flavin's reasoning "is pretty close to the conventional wisdom in oil-watching circles."

Less conventional is one of his recommendations for reducing the vulnerability of major industrial nations: that special tax breaks and subsidies that encourage certain types of energy use and in effect discourage energy conservation be gradually removed so that all domestic energy sources can "compete on the same level playing field." Flavin also recommends financial incentives for manufacturing and

	Annual Production	Reserves	Reserves/Production
	(billion barrels)		(ratio)
Kuwait	0.36	90.0	250
Iraq	0.43	44.5	104
Saudi Arabia	1.71	169.0	99
United Arab Emirates	0.44	31.9	73
Iran	0.80	48.5	61
Libya	0.40	21.1	52
Mexico	1.10	48.6	45
Venezuela	0.68	25.8	38
Nigeria	0.51	16.7	33
United Kingdom	0.94	13.6	14
Soviet Union	4.53	63.0	14
United States	3.79	34.5	9
World Total	21.10	707.2	34

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purchasing products that use energy efficiently. Finally, he calls for import taxes on oil and gasoline — like the seemingly ill-

fated proposal recently drafted and advanced by the Republican leadership in the U.S. Senate.  
—J. Raloff

## Old nova sparks a new theory

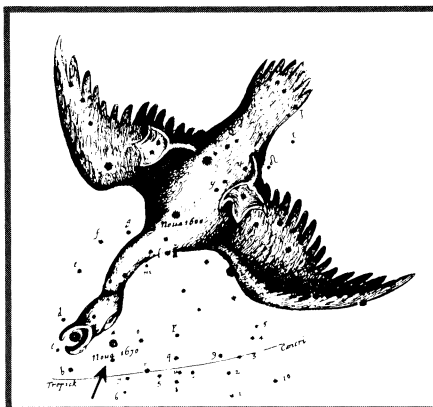
The astronomical term "nova" comes from the Latin phrase *stella nova*, new star, which old-time astronomers applied to the sudden appearance of a bright star where they had seen none before. After the invention of telescopes, astronomers found out that these phenomena are explosions that happen to stars that were always there but were sometimes invisible to the naked eye. Unlike supernovas, which essentially blow the whole star away, ordinary novas may recur. However, because recurrence is a matter of millennia, astronomers studying the evolution of novas must look into the astronomical records of the past. Three astronomers have now "recovered" — that is, found — the star responsible for a conspicuous nova of the year 1670. The observation leads them to suggest that a nova's life cycle is much longer than astronomers

have thought.

The three astronomers, Michael M. Shara of the Space Telescope Science Institute in Baltimore, Anthony F.J. Moffat of the University of Montreal and Ronald F. Webbink of the Joint Institute for Laboratory Astrophysics in Boulder, Colo., point out in the July 1 *ASTROPHYSICAL JOURNAL* that the first to note the 1670 nova was apparently the Carthusian monk Pere Dom Anthelme of Dijon, France. Shortly afterward a famous astronomer of the period, Johannes Hevelius of Danzig (now Gdansk, Poland), found it. The nova is listed in contemporary records as *nova sub capite cygni*, the nova under the head of the swan. But it is now called CK Vulpeculae, for the constellation *vulpecula cum anser*, the little fox with the goose. It is the oldest nova yet recovered, Shara says.

From the 17th-century records Shara, Moffat and Webbink determined the position of the nova as right ascension 19 hours 45 minutes 32.41 seconds and declination +27° 11' 22.6". There they found a very faint star surrounded with bright matter that looks like ejecta. From the geometry of the ejecta, they determined that some of them had been thrown out in the plane of the star's equator and some off the pole. The first surprise was that the central star is much fainter (magnitude 10.4) than expected from the generally accepted theory, which is based on more recent novas — "100 times fainter than any other nova," says Shara.

The three observers then used the old records to determine a light curve, a graph



Hevelius found nova below swan's head.