Oil shale is still a pig in a poke

Randy Udall OPINION ESSAY March 13, 2006 *Web Exclusive*

More than half the world's oil shale is found in Utah and Colorado, and for a century, men have tried to unlock this energy source. The rocks have proved stubborn, promising much, delivering little.

"I find it disturbing that we import oil from Canadian tar sands, even though our oil shale resource remains undeveloped," complains Utah Republican Sen. Orrin Hatch.

Oil shale is a poor fuel. Compared to the coal that launched the Industrial Revolution and the petroleum that sustains modern life, oil shale is the dregs. Coal seams a few feet thick are worth mining because coal contains lots of energy. If coal is good, petroleum is even better. And oil shale? Pound per pound, it contains just one-tenth the energy of crude oil and one-sixth that of coal.

Searching for appropriate analogues, we enter the realm of

Weight Watchers. Oil shale yields about 30 gallons of petroleum per ton. An equal weight of granola contains three times more energy. The vast deposits of shale in Colorado have the energy density of a baked potato. If someone told you there were a trillion tons of tatertots buried 1,000 feet-deep, would you rush to dig them up?

There are two ways to produce shale oil. Historically, the rock has been mined, crushed and roasted in an enormous kiln. This is costly and polluting. The slag, swollen in volume and contaminated with arsenic, must be safely stockpiled. The entire process is so laborious that global production has never exceeded 25,000 barrels a day. Yet recently, Royal/Dutch Shell has experimented with a new way to produce oil shale, a way that is, at first glance, promising.

Humor columnist Dave Barry once infamously demonstrated that if you put a "strawberry Pop-Tart in a toaster for five minutes and 50 seconds, it will turn into a snack-pastry blowtorch, shooting flames up to 30 inches high." Putting a chunk of oil shale into your toaster would not offer similar excitement, but Shell's experiments near Rangely, in rural western Colorado, resemble something Barry might attempt if he had the money to build the world's largest underground oven.

Shell's plan is audacious: The company proposes to heat a 1,000-foot-thick section of shale to 700 degrees over a 100-acre production plot. Inside that area, the company would drill up to 1,000 wells. Next, long electric heaters would be inserted in preparation for a multi-year "bake." If all went well, the company would eventually harvest $6 billion worth of oil at today's prices.

Although Shell's method avoids the need to mine shale, it requires a mind-boggling amount of electricity. To produce 100,000 barrels per day, Shell would need to construct the largest power plant in Colorado history. The $3 billion power plant would consume five million tons of coal each year and produce 10 million tons of greenhouse gases, some of which would still be in the atmosphere a century from now. To double production, you'd need two power plants. One million barrels a day would require 10 new power plants, five new coal mines.

As Shell continues its experiments, Congress is spurring an oil shale land rush. So far, 10 companies have expressed interest in leasing federal lands. The RAND Corp., however, warns that if initial development overstresses the environment, "we may never see more than a few hundred thousand barrels per day of production." Nonetheless, one scenario recently proposed by the U.S. Department of Energy is less a vision than a nightmare of open-pit mines

2,000 feet deep, with all of Colorado's surplus water dedicated to the oil shale industry.

Americans love panaceas. We want thinner thighs in 30 days, a pill to cure baldness, an ultrasonic carburetor that will double our mileage. Since domestic oil production peaked 30 years ago, the need for energy efficiency, conservation and renewable energy has long been obvious. But like an addict on a binge, we continue to pursue a policy of strength through exhaustion.

Producing 100,000 barrels per day of shale oil does not violate the laws of physics, though it would cost a great deal for a small return. Increasing the efficiency of America's automobiles by two miles per gallon would save 10 times as much fuel and also save consumers $100 billion at the pump.

Oil shale contains far less energy than than hog manure, peat moss or even household garbage. A meager amount of energy tightly bound up in an enormous volume of rock, oil shale seems destined to remain an elusive bonanza, the petroleum equivalent of fool's gold.

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