

Is Oil Running Out?

Kerr's geological description of oil depletion omits *demand*, which depends on efficient use and alternative supplies.

Natural gas is widespread, abundant, and climatically benign if wellhead-reformed with carbon dioxide (CO₂) reinjection¹, producing three profit streams— shipped H₂, enhanced CH₄ recovery, and sequestered CO₂. Combined-cycle CH₄-fired power stations dominate new generation, but are starting to be displaced by onsite co- and trigeneration, which deliver electricity about 2- to 10-fold more cheaply after crediting useful heat². Renewables are increasingly competitive, the fastest-growing energy source in Europe, and plausible sources of half the world's total energy by 2050³.

Progress is even greater in superefficient conversion and end-use. Ultralight hybrid-electric cars⁴— uncompromised and competitive— have multibillion-dollar private commitments, are coming quickly to market⁵, and will ultimately save as much oil as the Organization of Petroleum Exporting Countries now sells. The most efficient will use H₂ fuel cells whose immediate commercialization, now feasible⁵, can displace most if not all oil, coal, and nuclear power at a profit.

If oil became scarce, its rising price would speed these alternatives; yet most can beat even today's low and failing energy price. Many will be bought for other reasons— end-use efficiency's superior service quality, renewables' and fuel cells' distributed benefits⁶. Most important, a decade ago, available end-use efficiency could have saved four-fifths of

U.S. oil use at average costs of around \$2.50 per barrel⁷. The scores of market failures that left most of these savings unbought are now becoming well understood— along with ways to turn each obstacle into a business opportunity⁸.

Together, these technical and barrier-busting innovations could make oil uncompetitive even at low prices before it becomes unavailable even at high prices. Like uranium earlier, and coal increasingly, oil could become no longer worth extracting— good mainly for holding up the ground. Of course, this cornucopia is the manual model: you have to turn the crank. But many smart firms are already doing so⁹.

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References and Notes

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- ² For example, from Trigen, Inc. (White Plains, NY, 914-286-6600), with system efficiencies upward of 90%.
- ³ P. Kassler, "Energy for development" (Shell Selected Paper, Shell International Petroleum Co., London, 1994).
- ⁴ A. B. Lovins, "Hypercars: The next industrial revolution" (RMI Publ. T96-9, Rocky Mountain Institute, Snowmass, CO, 1996; www.rmi.org/hypercars/osaka/index.html; see also www.hypercar.com).

- ⁵ ____ "Putting central power plants out of business" (RMI Publ. E98-2, Rocky Mountain Institute, Snowmass, CO, 1998; redtail.stanford.edu/seminar/presentations/lovins/std001.htm).
- ⁶ ____ and A. Lehmann, *Small Is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size* (Rocky Mountain Institute, Snowmass, CO, in press).
- ⁷ A. B. Lovins and L. H. Lovins, "Make fuel efficiency our Gulf strategy" (RMI Publ. S90-26, Rocky Mountain Institute, Snowmass, CO, 1990); details in ____, *The World Petroleum Market in the 1990s*, R. Reed and F. Fesharaki, Eds. (Westview, Boulder, CO, 1999; RMI Publ. S91-15, Rocky Mountain Institute, Snowmass, CO, 1989).

- ⁸ A. B. Lovins and L. H. Lovins, "Climate: making sense *and* making money" (RMI Publ. E97-13, Rocky Mountain Institute, Snowmass, CO, 1997; www.rmi.org/catalog/climate.htm).
- ⁹ P. Hawken, A. B. Lovins, L. H. Lovins, *Natural Capitalism* (Little Brown, New York, in press).