

Book review

P.R. Odell, *Why carbon fuels will dominate the 21st century's global energy economy*, Multi-Science Publishing Co., UK, 2004 (£39, 192 pp.).

As any aging veteran of the energy wars will attest, Peter Odell has never shied away from controversy and his latest contribution shows that age has not slowed him down in the least. From the opening sentence that the scarce commodity today is not carbon fuels but realism about energy supply and use, to the closing chapter about the possible inorganic origin of hydrocarbon energy resources, Peter Odell's new book will delight challengers of conventional pieties and discomfort those who see energy as the source of the world's problems. Quite aside from these effects, the book deserves serious consideration not only because it is well written, brief, and closely reasoned, but even more so, because time has proven the author largely correct in his earlier analyses and arguments.

Odell's core thesis is, as stated plainly in the title, that carbon fuels (vice fossil fuels since the origin may not be biogenic) will dominate the 21st century. This is a very distant horizon to contemplate, but it is necessary because so much of the energy debate today is motivated by the climatic consequences of the use of carbon fuels. His argument is not that the world will never run out of carbon fuels, but that the likely demand, available supplies, and the cost of renewable alternatives are such that carbon fuels will dominate during this century. For what it is worth, the author allows that the carbon fuel share of total energy use will likely be diminishing in the last third of the 21st century. The most easily remembered formulation of his thesis is that natural gas will ascend as the dominant carbon fuel in the course of the 21st century, as oil reigned during the 20th and coal in the 19th.

Although this book focuses on the future, the perspective that it offers is the stronger for its commendable attention to the past. The analyses and predictions that characterized the 1970s, when energy availability first became a major public concern, are recalled, dissected and analyzed in some detail. This makes for fun reading, but it is also sobering. The earlier and almost silly assumptions about energy supply are now so widely seen as erroneous that no further discussion is warranted. However, Odell's reminder that

the near panic surrounding energy in those years also depended on invalid assumptions about demand is less well remembered and perhaps even more relevant for thinking realistically about the 21st century. Odell notes that a key ingredient in the "gap" analysis that dominated the 1970s was the extrapolation of the very real, but historically unique, high rate of growth in global energy demand since the end of World War II. He argues convincingly that this rate of growth has not, will not, and cannot recur. This leads to his observation that the use of carbon fuels in the 21st century will be demand-limited, not supply constrained. For economists, this is a distinction without much meaning, but it is a useful one in the public debate where demographic trends, energy-saving technological progress, and the shifting of final demand away from energy intensive uses receive much less attention than they should.

Odell's view that natural gas will reign as the dominant carbon fuel in the 21st century is likely to be a little more controversial, but it is utterly plausible and absolutely necessary for shaking loose from the shackles of thinking inherited from the 1970s. That era gave us two memorable phrases about energy: that nuclear power would be "too cheap to meter" and that natural gas is "too valuable to burn under a boiler." Both are now seen as being almost hilariously misleading, but the second has yet to register with efforts at long-range energy forecasting, where a century-long horizon is required to evaluate the anthropogenic contribution to climate change. Typically, these modelers accept the revision concerning nuclear power, since no further expansion is foreseen, but not that for natural gas, which remains a scarce fuel in a world that reverts to coal and synthetic fuels in the latter half of the 21st century. Instead of rising to three or four times the world's current level, carbon emissions double at most in Odell's gas-dominated, low-energy-demand world. If it does nothing else, this book will have performed a great service if it establishes the plausibility of natural gas as the reigning carbon fuel in the 21st century and persuades analysts to consider the implications of this prospect.

There are many more fascinating insights and stimulating arguments in this book which is organized conventionally into chapters on aggregate demand, coal, oil, gas, costs, and one final irresistible provocation, the

discussion of a theory of Russian origin, generally regarded on a par with Lamarckian evolution, that carbon fuels are renewable. While I don't agree with all the arguments Peter Odell makes (for instance, his analysis of North American natural gas and the role of environmental considerations), and I think he gives short shrift to some topics (electricity, the war on terror), these are matters for enjoyable discussion, not serious flaws. Anyone seriously interested in energy will

do himself a great disservice by not taking the time to read this well written, concise, and compelling book.

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