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ENERGY AT THE CROSSROADS: GLOBAL PERSPECTIVES AND UNCERTAINTIES 2003. Vaclav Smil, MIT Press, 2003. 427 Pages. ISBN 0-262-19492-9

This is a book written by a man with a vast store of knowledge and experience, fluently written and well illustrated. Facts and interpretations are thoughtfully embedded in the context of environmental and energy debates. The author has perhaps rather too little faith in humanity and technology. Although a pleasure to read and a store of much wisdom, the book is biased towards perceptions prevailing in North America. \*(Smil's more recent book on China may address this imbalance.)\*

The author reviews the past to speculate about the future, analysing and then condemning a world increasingly hungry for energy. He asserts that there cannot be another expansion of total primary energy supply (TPES) as witnessed in post-1900, yet also insists that nobody can foretell the future. There is no future for the fossil-fuelled civilisation of today, according to Smil who even wishes for 'indubitable evidence for imminent and near catastrophic global warming' (p. 372), so that the crisis may stimulate our capacity to change quickly and fundamentally. On details, advice is sparse and tends towards green platitudes; our connections to the universe need to be redefined, he argues. As I read him, change should be directed less towards 'decarbonisation' than the reduction of energy consumption. Not fossil fuels as such, but the ever increasing energy through-puts stand condemned as irrational and requiring change 'before it is too late to salvage the irreplaceable underpinnings of biospheric services that humanity is destroying by the growing use of energy and materials'.

\*On nuclear power, Smil remains loyal to green ideology. Fission might increase its share of total primary energy, though it 'most likely will not' (p. 319). While 'global warming' should have weakened the perception of nuclear power being evil, this, he claims, has not happened. By 2005 the evidence was surely otherwise. The future of fossil fuels is discussed in a balanced fashion; not 'limits to growth', but human regulation will decide their fate. 'Neither abundant resources nor competitive prices determine a fuel's future' (p. 203). It is wrong, however,

to claim that globally coal production is stagnating or declining. The supply of oil, even according to the most optimistic forecast, is likely to decline from 2050, but even here major uncertainties remain. Renewables alone, Smil is certain, cannot replace fossil fuels.\*

Chapter three may be of great interest to readers of this journal. The author turns vehemently 'Against Forecasting' in a penetrating and, to me, familiar saga exposing the energy modelling and forecasting. Arrogance and abject failure have prevailed and were practised by self-serving parties or academic dreamers. In 1976, Amory Lovins predicted that 'soft' energy technologies would supply one-third of US energy in 2000 though actually it was 7%. The following will sound 'climate sceptics': 'They (the modellers) think they can do better by making their creations progressively more complex, by including drivers and feedbacks. They do not realise that (this) ... also necessitates the introduction of more questionable estimates (... soon pure guesses ...) and often also of longer chains of concatenated assumptions ... (that) defeat the very quest for more realism, and generate surrogates for actual systems' (p. 172). Smil warns of naïve and outright ridiculous predictions for the future, recommending normative scenarios instead. These outline what should, rather than what is likely to happen. However, they may be politically more difficult to obtain. Bureaucracies engaged in strategic energy planning exercises may be attracted, especially if research can be prevailed upon to provide the justifying crisis.

Why does Smil apply this analysis of forecasting only to economic and not to 'scientific' predictions of climatic change? He clearly recognises that energy forecasts are the foundation of the emissions scenarios used by the Intergovernmental Panel on Climate Change (IPCC), a subject he deals with, very critically. This scepticism is not extended to the radiative forcing – anthropogenic warming hypothesis, however, where the prevailing consensus is uncritically accepted. Nevertheless, even climate forecasting remains 'imperfect work in progress', future atmospheric temperatures cannot be predicted and all emission forecasts remain 'highly uncertain, regional impacts unreliable' (p. 342). Having admitted this, Smil nevertheless concludes that these inherent uncertainties

have made it easy to turn the debate about climate change into pointless, and endless, arguments about the extent and the rate of future warming and, for economists, about the cost of reducing future Greenhouse Gas (GHG) emissions (pp. 344–345). Why pointless, unproductive and counter-productive arguments?

Smil argues without reference to critics like Lomborg and some political scientists<sup>1</sup> that ‘all responsible steps’ should be taken to reduce GHG emissions. Everywhere? Who is responsible? He escapes via the no-regret formula, but whose no-regrets? The political analysis of the interactions between energy (now mainly in private hands) and emission control (by public regulation and with subsidies) is therefore largely missing. Emissions will be cut when doing so is profitable to investors. Taxpayers are not interested, nor is the competition between economies, which increasingly for many, depend on imported energy. Smil considers the meagre emission cuts envisaged by Kyoto as ‘indefensible’ because ‘major reductions of GHG emissions can be achieved with minimal socio-economic costs’ (p. 342). This does not explain the failing negotiations of the Protocol. The author shows little interest in the institutions of energy engaged in competition for markets, regulations and subsidies. The book leaves

‘believers’ in global warming reassured about the threat facing the planet from fossil fuels, though unsure about what energy policy options ought to be pursued.

Smil reveals himself as green and radical. His speculations about the future and belief in fossil fuel made ‘global warming’ are, at least in part, undermined by his attack on energy forecasting and emission scenario building. This reader was confused.

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#### NOTE

1. Boehmer-Christiansen and Kellow, *International Environmental Policy: Interests and the Failure of the Kyoto Process*.