

Quotes From "Renewable Energy Cannot Sustain a Consumer Economy"¹

Anyone who has illusions about the likelihood of renewable energy becoming our sole energy source needs to read Ted Trainer's book. Some of the more notable quotes from his book are presented below.

Energy Consumption

"If the present world population were to consume energy at the rich-world per capita rate, world supply would have to be five times its present volume. World population is likely to reach 9.4 billion by 2070. If all these people were to consume fossil fuels at present rich-world per capita consumption rates, all probably recoverable conventional oil, gas, shale oil, uranium and coal (2000 billion tonnes assumed as potentially recoverable), would be totally exhausted in about 20 years)."

"To keep the (CO₂) concentration below 450 ppm (LS: the old, far too high level specified by the IPCC), CO₂ emissions must be cut to about 1 gigaton per year by 2100, and to about 0.3 Gt/y by 2200. This target is much too high. If world population reaches 9+ billion, a global carbon budget of 1 Gt would provide us all with about 150 kg of fossil fuel per year, which is around 2-3% of our present rich-world per capita use of fossil fuels. Alternatively, only about 170 million people, 2.5% of the world's present population, could live on the present rich-world per capita fossil fuel use of over 6 tonnes of fossil fuel per year."

"Consumer-capitalist society has overshoot viable levels of production and consumption by a huge amount. In effect we have to give up fossil fuels altogether. That is, we have to live almost entirely on renewables. This book argues that these very high levels of production and consumption and therefore of energy use that we have in today's consumer-capitalist society cannot be sustained by renewable sources of energy."

Limits of Renewable Energy

"However, the foregoing numbers only define the magnitude of the present problem. This is nothing like the magnitude of the problem set when our commitment to growth is also taken into account.....The question of whether we can run our society on renewable energy is therefore not about whether it can meet present demand, and this book concludes that it cannot do that....it is about whether it can meet the vastly increased demand that will be set by the pursuit of limitless increase in production and consumption."

".it is generally believed that sources such as the sun and the wind can replace fossil fuels, providing the quantities of energy that consumer society will need, in the forms and at the times that they are needed. Surprisingly, almost no literature has explored whether this is possible. Unfortunately, in the task of assessing the validity of this dominant assumption we have not been helped by the people who know most about the field, the renewable energy experts."

" They have a strong interest in boosting the potential of their pet technology and in not drawing

¹ Ted Trainer. Published 2007 by Springer.

attention to its weaknesses, difficulties and limits. Exaggerated, misleading, questionable and demonstrably false claims are often encountered in the promotional literature. Minor technical advances which might or might not become significant in the long run are announced as miraculous solutions. Doubts regarding the potential of renewable technologies are rarely if ever heard from within these fields."

"In developing the following review, considerable difficulty has been encountered from people hostile to having attention drawn to the weaknesses in their technologies and proposals (including threats of legal action if data they have provided in personal communications is used). Sources eager to provide information tend to dry up when they realize that limits are being explored. In addition some of the crucial information will not be made public by the private firms developing the new systems. For example it is almost impossible to get information on actual windmill output in relation to mean wind speeds at generating sites."

"Unfortunately these difficulties have meant that at times it has not been possible to get access to information that would settle an issue and that must exist somewhere, and that at times one has to attempt an indirect estimation using whatever scraps of information one has been able to find."

"Renewable energy can meet various needs very well, or perfectly in many regions, such as heating and cooling space via simple "solar passive" designs...However, renewables face formidable problems with respect to two forms of energy which consumer society demands in enormous quantities, vi. electricity and liquid fuels."

"The situation is clearest with respect to liquid fuel (i.e. oil plus gas). There is no possibility of getting the quantity we take for granted, no matter what plausible assumptions are made regarding technical advances. There are only two possible sources of renewable liquid fuels, biomass and hydrogen. Even wild optimism about potential land and energy yields cannot provide the world's future 9.4 billion people with more than perhaps 10% of the per capita liquid fuel consumption we now average in rich countries."

"It is quite misleading to focus on the contribution a renewable source can make when it is merely augmenting supply largely derived from coal or nuclear sources. In that situation the significant problems set by the variability of renewables can be avoided.....However, the problem this book is concerned with is the development of systems in which almost all energy used comes from renewables, and that means we would have to provide for large fluctuations in energy production, and thus for the storage of large quantities of energy. At this point in time there is no satisfactory solution in sight for this problem, on the scale that would be required."

"At present it seems that the variability of wind means that it probably cannot provide more than 25% of demand in the best wind regions, and perhaps no more than 10 to 15% in most good wind regions."

Hydrogen Fuel

"The belief that the world will soon run on a "hydrogen economy" is very common. The first challenge to this faith-based assumption is the question of a source for the huge quantities of hydrogen that will be required. We are not likely to get enough energy from solar or wind sources to meet electricity demand, let alone have any left over to convert into hydrogen. But

even if we had a lot of hydrogen, there are coercive arguments as to why we still could not have a hydrogen economy."

" These involve the difficulties posed by the physical nature of the very small and light hydrogen atom. Large volumes of hydrogen have to be pumped or stored before much energy arrives at the destination, and this consumes a lot of energy....in one estimate pumping hydrogen from the Sahara to northern Europe would use up the equivalent of 65% of the energy pumped...there would be other losses ...in moving the hydrogen into fuel tanks and especially driving motors and generating electricity. Finally fuel cells are likely to deliver at most 50- to 60% of the energy that reaches them as hydrogen after all those pumping losses."

Techno-fixes

"Most people assume that although some of our resources and ecological problems are very serious, they can be solved by strategies like greater recycling efforts and the development of better technology. This "tech-fix" position is quite mistaken because the overshoot is already far too big for this to be possible. Reductions possibly of the order of 90% are required in rich-world per capita resource use. All our problems will rapidly become worse if we continue to be obsessed with constantly increasing production and consumption, living standards and the GDP. Yet these are the fierce and supreme commitments of just about all governments, economists and people.."

Perils of Consumerism

"A global consumer-capitalist society cannot be made sustainable or just. We cannot solve the big global problems such a society generates unless we face up to transition to a very different kind of society....there must be change from it to very different social, economic, geographical, political and cultural systems."

"Almost all environmental activists seem to be oblivious to the contradiction built into their thinking. They are in effect saying: 'Please help us save the planet by switching to the use of renewable energy sources...which can sustain consumer society and will pose no threat to our obsession with affluent lifestyles and economic growth'."

"A sustainable and just society cannot be a consumer society, it cannot be driven by market forces, it must have relatively little international trade and no economic growth at all. It must be made up mostly of small local economies, and its driving values cannot be competition and acquisitiveness. Whether or not we are likely to achieve such a transition is not crucial here (and I am quite pessimistic about achieving it). The point is that when our "limits to growth" situation is understood, a sustainable and just society cannot be conceived in any other terms."

"If it is the case that a sustainable and just world cannot be achieved without transition from consumer society to a Simpler Way of some kind, then this transition is being thwarted by those who reinforce the faith that technical advances will eliminate any need to even think about such a transition."

And In Conclusion...

One important point, made by Trainer above but which needs emphasis, is that many of the speculative scenarios about renewable energy are overly optimistic because they assume

(without always explicitly saying so) that, in the United States and other First World countries, renewables will be ADDED ON to coal and nuclear energy, which will in this scenario continue to be the main source of base load electricity. I think Trainer is correct in assuming that these people do not foresee (much less propose) ending the use of coal and nuclear. Nor does our government nor does the coal industry nor do the nuclear utilities.

Trainer does not address the equity and social justice issue in detail, but deals mostly with the advanced consumer societies of the world. That these patterns of consumption and growth can be continued in a renewable energy economy is one of the worst assumptions of our time. That the services of the earth's ecosystems will remain fully functional and available to fuel such a consumer society indefinitely is the other side of those bad assumptions. These are the paradigms of denial, under which capitalism and economic growth operate. And they flourish because humans don't want to hear the bad news.