

Energy Tribune Talks With Jesse Ausubel

Jesse Ausubel is the director of the Program for the Human Environment at Rockefeller University in New York City. Ausubel, who did his undergraduate work at Harvard and graduate work at Columbia, has a long history of working on environmental issues. In 1979, he was one of the main organizers of the first U.N. World Climate Conference in Geneva. In 1983, he was the lead author of *Changing Climate*, the first comprehensive review of the greenhouse effect. Over the past two decades or so he has been involved in a number of research projects ranging from the health of forests to an ongoing international effort aimed at assessing the diversity and abundance of life in the oceans. In July, he published a paper called “Renewable and nuclear heresies” in which he heretically declared that “renewable sources of energy are not green and that the nuclear industry should make a product beside electricity.” (The paper is available here: <http://phe.rockefeller.edu/docs/HeresiesFinal.pdf>) Ausubel corresponded with Robert Bryce via email in early August 2007.

Q: Your paper “Renewable and nuclear heresies” has been attacked by the left and lauded by the right. The left says you are ignoring the threats of global warming while the right points out that you don’t like renewables. What is your position on the viability of carbon dioxide emission reduction efforts like Kyoto?

I do not think energy policy matters much over the long run. Certainly diplomats do not reduce greenhouse gas emissions. In general, politicians are pulling on disconnected levers. My skepticism about public policy angers left and right about equally. The evolution of the energy system is driven by the increasing spatial density (watts per square meter) of energy consumption at the level of the end user. The increasing spatial density drives the system towards gas and electricity and the energy sources that enjoy economies of scale in producing them.

Q: In reading through your recent publications, you don’t talk about climate change much. Why not?

I was deeply involved in the late 1970s and early 1980s in the modern formulation of the climate change issue. Continuing and accelerating decarbonization is one of the two great environmental challenges along with sparing land and sea for nature. But I think climate change has been an intellectually solved problem since 1990 or so. I have little to add, and I find few new ideas, especially in relation to the huge expenditure on research during the past couple of decades. The main new information is just the accrual of the climate record year by year.

Q: What was your take on Al Gore’s movie, *An Inconvenient Truth*?

I did not see the movie but did look at the book. A better title would be “An Inconvenient Likelihood.” Gore is so busy sharing what he knows that he rather neglects to share what is unknown and especially what may be unknowable. The treatment of

ways to reduce emissions is also weak. However, I admire Gore's persistence. Repetition makes things stick, like the refrain of a song.

Q: Are you in favor of methods like a carbon tax or a cap-and-trade system to limit carbon dioxide emissions? If not, what, if anything, should be done to reduce carbon dioxide emissions?

The outcome of the taxes and trading will likely bear little relation to what experts forecast. I will wager the main beneficiaries will be government administrators, lawyers, accountants, and financial intermediaries, not people bothered by weather and climate. Keeping energy cheap for end-users matters. For those adapting to climate change, cheap energy matters enormously. Cheap energy can translate into cheap water, for example, through pumping or desalination. Cheap energy also means people can range further in search of jobs and income. On the supply side, very large (5 GW) efficient high-temperature, high-pressure power plants fueled with methane with carbon capture and sequestration and nuclear power plants can keep emissions from frightening levels.

Q: You are writing a lot about the decarbonization of the global fuel mix and the trend toward increased natural gas consumption. That trend is clearly positive on many levels. Why in your opinion, have the environmentalists ignored the benefits of methane? Are they too wedded to their belief that the only way forward is through wind and solar?

Natural gas grew largely as a ward of the oil industry, as enterprises drilled for oil and found "associated" gas. In the USA and several other key countries gas has never managed to establish an independent identity. Many people harbor misconceptions about scarcity of gas, and a distaste for the "big oil" companies that control petroleum. Advocates of nuclear, coal, and renewables all like to believe in early exhaustion of gas. So, increasing reliance on natural gas tends to be overlooked, even as gas use rises.

Q: I like your discussions about the trend toward ever-greater energy densities in the fuel mix. Is this a trend which, like decarbonization, needs no encouragement from government?

Urbanization drives the trend toward higher density of consumption. Shanghai, Kuala Lumpur, Bangalore, and hundreds of other cities are going vertical. Governments have not had much success in keeping people out of cities. In turn, compact sources for energy can more easily meet huge concentrated demand. Thirteen railcars of switchgrass equal one of coal, and a kilogram of methane has about five times the energy of coal. A kilogram of uranium contains about 10,000-100,000 times the energy of a kilo of methane. Militaries understand that if you want high energy, atoms overpower gunpowder and stones.

Q: What, if anything, should the government be doing to stimulate progress on the trends that you describe: decarbonization, ever increasing energy density, ever smaller electric generation plants, etc.?

Decarbonization would proceed more easily if careful offshore exploitation of natural gas were permitted in more regions, and also if natural gas pipelines were briskly and wisely sited. With regard to basic research, top leaders could usefully convey a long-range technical vision of a much more efficient system operating largely on methane and nuclear power and support fields such as high-temperature materials essential to operational success. Demonstration projects, for example, for superconducting electricity cables wrapped around pipes carrying hydrogen also need government support and permissions.

Q: In my earlier interview with Vaclav Smil, I asked him about his feelings about Amory Lovins. As you probably know, Smil is not a fan. Why does Lovins get so much laudatory press? What's your opinion of Lovins and his theme of "efficiency will save us"?

Amory has earned a good living as a motivational speaker. He gives sermons people pay to hear, even while they continue to sin. I admire Amory's faith. He is sincere and hard-working. His ideas fail to diffuse in practice because people are not rational in ways he hopes. People make choices based on basic instincts about time budgets and social status, for example. And efficiency is not a goal in general for individuals and households. People do not acquire the efficient amount of shoes or soda or shrubbery.

Q: You are pro-nuclear. Do you favor building more reactors of the current design (pressurized water) or do you like the new technologies (pebble bed, etc.)?

Both. For the next 30-40 years, the main model will be the one people know how to build and service. The present designs work fine. But I look forward to scalable high-temperature gas-cooled reactors that can also produce hydrogen becoming a common purchase.

Q: Given your long history of working on environmental issues, why are environmental groups like Greenpeace, Sierra Club et al., so married to renewables while refusing to acknowledge the low-carbon potential of nuclear power? Are there any arguments (yours included) which might bring them around?

Arguments rarely bring anyone around. Everyone, including greens, subscribes to a packet of ideas. The packet for many greens includes dislike of large enterprises and fear of catastrophic events, which makes them anxious about nuclear energy even though "objectively" nuclear energy safely spares nature. But maintaining fervor is hard, and a law of conservation of concern allows only a few fears and enthusiasms to be in the foreground. Fervor against nuclear energy will wane, as fervor about dangers of steam engines waned. Steam engines did reorganize society, by the way, for better and worse; their explosions were almost completely controlled but the mobility they unleashed changed everything. Abundant nuclear electricity and hydrogen would transform Earth including human society in many ways we do not perceive. In 70 years we may have stopped worrying about greenhouse gases but may worry a lot about the ecological effects of nighttime illumination. Werewolf microbes might take power!