

Renewable energy wrecks environment, scientist claims

July 24 2007

Renewable does not mean green. That is the claim of Jesse Ausubel of the Rockefeller University in New York. Writing in *Inderscience's International Journal of Nuclear Governance, Economy and Ecology*, Ausubel explains that building enough wind farms, damming enough rivers, and growing enough biomass to meet global energy demands will wreck the environment.

Ausubel has analyzed the amount of energy that each so-called renewable source can produce in terms of Watts of power output per square meter of land disturbed. He also compares the destruction of nature by renewables with the demand for space of nuclear power. "Nuclear energy is green," he claims, "Considered in Watts per square meter, nuclear has astronomical advantages over its competitors."

On this basis, he argues that technologies succeed when economies of scale form part of their evolution. No economies of scale benefit renewables. More renewable kilowatts require more land in a constant or even worsening ratio, because land good for wind, hydropower, biomass, or solar power may get used first.

A consideration of each so-called renewable in turn, paints a grim picture of the environmental impact of renewables. Hypothetically flooding the entire province of Ontario, Canada, about 900,000 square km, with its entire 680,000 billion liters of rainfall, and storing it behind a 60 meter dam would only generate 80% of the total power output of Canada's 25 nuclear power stations, he explains. Put another way, each

square kilometer of dammed land would provide the electricity for just 12 Canadians.

Biomass energy is also horribly inefficient and destructive of nature. To power a large proportion of the USA, vast areas would need to be shaved or harvested annually. To obtain the same electricity from biomass as from a single nuclear power plant would require 2500 square kilometers of prime Iowa land. "Increased use of biomass fuel in any form is criminal," remarks Ausubel. "Humans must spare land for nature. Every automobile would require a pasture of 1-2 hectares."

Turning to wind Ausubel points out that while wind farms are between three to ten times more compact than a biomass farm, a 770 square kilometer area is needed to produce as much energy as one 1000 Megawatt electric (MWe) nuclear plant. To meet 2005 US electricity demand and assuming round-the-clock wind at the right speed, an area the size of Texas, approximately 780,000 square kilometers, would need to be covered with structures to extract, store, and transport the energy.

One hundred windy square meters, a good size for a Manhattan apartment, could power an electric lamp or two, but not the laundry equipment, microwave oven, plasma TV, and computer. New York City would require every square meter of Connecticut to become a wind farm to fully power all its electrical equipment and gadgets.

Solar power also comes in for criticism. A photovoltaic solar cell plant would require painting black about than 150 square kilometers plus land for storage and retrieval to equal a 1000 MWe nuclear plant. Moreover, every form of renewable energy involves vast infrastructure, such as concrete, steel, and access roads. "As a Green, one of my credos is 'no new structures' but renewables all involve ten times or more stuff per kilowatt as natural gas or nuclear," Ausubel says.

While the full footprint of uranium mining might add a few hundred square kilometers and there are considerations of waste storage, safety and security, the dense heart of the atom offers far the smallest footprint in nature of any energy source. Benefiting from economies of scale, nuclear energy could multiply its power output and even shrink the energy system, in the same way that computers have become both more powerful and smaller.

"Renewables may be renewable but they are not green," asserts Ausubel", If we want to minimize new structures and the rape of nature, nuclear energy is the best option."

Source: Inderscience Publishers

Citation: Renewable energy wrecks environment, scientist claims (2007, July 24) retrieved 25 April 2024 from <https://phys.org/news/2007-07-renewable-energy-environment-scientist.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.