

Helsingin Sanomat article about Jesse Ausubel, June 15, 2004, Section "Economy"

## FIGHTING GREENHOUSE EFFECT WITH NATURAL GAS AND NUCLEAR POWER

Jesse Ausubel: Renewable energy sources waste nature and natural resources

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*Figure legend: The greatest concern of Jesse Ausubel is global reduction in the number of species. Therefore, energy production should leave an ecological footprint as small as possible.*

"Renewable energy sources are not green. Wind, solar energy, and hydropower have serious limitations when applied on a large scale. It is illusion and fantasy that they would solve world energy problems", says Jesse Ausubel.

According to the Director of the Human Environment Program at The Rockefeller University in New York, renewable energy sources unreasonably waste the environment and raw materials.

"Constructing wind mills uses 20-30 times more steel than a gas-fired power plant of the same effect. They also require huge areas of land."

Hydropower for that matter destroys life in streams, and growing biomass uses space from wild nature.

"Nobody who is concerned about reduction in the number of species can support cultivation of biomass for energy production at a large scale. I believe we can instead this century lands used by forestry and agriculture to revert to wild nature", says Ausubel.

Ausubel attended on Monday the seminar in honor of The Millenium Technology Prize in Espoo. He discussed the relationship between the environment and energy production with other top experts.

The hottest topic was how to prevent the warming of the atmosphere.

The solution that Ausubel presents is surprising. Electricity would be produced centrally in power plants fired by natural gas that are as large as possible and more efficient than existing power plants. Traffic fuel would be hydrogen-powered fuel cells obtained from nuclear power plants.

"My idea is that very efficient large power plants, for example, 5,000 megawatts, would be built connected to gas pipelines. Gas would be burned at such high temperature and pressure that the carbon dioxide produced would be in liquid form. It would be easy to collect and pump back into Earth", is Ausubel's vision.

The efficiency of high pressure power plants would be considerably better than present power plants. Moreover, the plants would use new technologies that could also allow them to be very small in physical size.

Sequestration of carbon dioxide is being developed in many energy companies and the problem is the high cost of the technique.

However, Ausubel estimates that sequestration would be efficient in really large plants. The existing projects aim at sequestration of carbon dioxide released from using coal. Ausubel would completely abandon the use of coal.

“Also other harmful substances than carbon dioxide are released from coal. In my opinion we should use feedstocks that are as clean as possible”, he says.

A large part of the emissions of carbon dioxide is released in traffic. There is no economic way of collecting carbon from the exhaust gases of numerous vehicles.

“Cars would need to burn hydrogen in fuel cells, and hydrogen would most efficiently be produced using nuclear power”, says Ausubel.

To opponents of nuclear power he says that all forms of energy production has risks.

“The position taken depends on how serious a problem society considers climate change. High efficiency and sequestration of carbon help, but the contribution of nuclear power is needed to make a real difference,” he says.

Ausubel reminds us that there are 430 nuclear power stations running at all times in the World, and Asian countries are constructing more. New plants are now being planned also in the US.

Many environmental thinkers would, especially in developing countries, promote small-scale and decentralized production of energy based on solar energy, wind, or biomass.

Ausubel believes that decentralized production can play a role in rural areas where the power grid may not exist.

“But they have no major function in India, eastern China, South East Asia, and the large cities of Latin America. Urban areas where population and energy use grow fast need large-scale solutions”, he says.

The United States, especially California, grows at such a pace that new ideas are needed in energy production.

Wealthy and slow-growing Europe can afford being active with wind energy and even biomass.

“Renewable energy forms are like small boutiques. They bring color and diversity in town, but large purchases are made elsewhere. There is space in Europe also for small shops”, Ausubel says.

#### EXTRA      Nuclear power receives support from strange direction

Nuclear power is beginning to receive support from an improbable direction. Jesse Ausubel has been supporter of nuclear power for a long time and yet considers himself very green. But this strange message is received also from the heart of the traditional environmental movement.

At the end of May one of the founding gurus of the environmental movement, James Lovelock, published an essay in support of nuclear power. In Lovelock’s opinion there is no time anymore to

wait for the development of new forms of energy production. Solar energy, wind power, and biomass cannot serve to fulfil the energy needs of developing or developed countries. What remains is nuclear power, which is the only large-scale energy source free of emissions of carbon dioxide and sulfur.

Lovelock is known for his Gaia Hypothesis. According to the theory, Earth is a living whole that almost like a conscious organism controls the equilibrium. One who disturbs this balance will perish.

Lovelock's views on nuclear energy have been received with confusion also in the Finnish environmental movement. Greenpeace hurried to condemn them as fairy tails of a man who is getting old.

"In his old days the fantasy of Lovelock (born 1919) is taking an unfortunate, very strange and gloomy track", wrote Kaisa Kosonen of Greenpeace in a message to an email list on energy issues last Thursday.