Nuclear Fusion

What is Nuclear Fusion?

Excerpt from ***Powering Our Future: An Energy Sourcebook for Sustainable Living.*** The text was modified to fit the website.

Scientists are diligently working in laboratories around the world to determine the possibility of commercially generating power from the nucleus of atoms without the long-term radioactive waste inherent to the nuclear fission industry. Today, nuclear fusion remains unproven as a commercially viable energy source. However, researchers have successfully produced enormous amounts of energy through two distinct approaches to nuclear fusion: thermonuclear fusion and cold fusion. Currently under investigation, these technologies are unlikely to transition from innovative ideas into robust commercialized energy systems before the end of the hydrocarbon era. If history is any guide, once a new energy system is discovered, it will take more than a decade to develop, commercialize, and incorporate the technology into mainstream society. As a barrier to its technical development, funding for unproven energy sources can be difficult to obtain. Nevertheless, a few researchers around the world are persisting in the quest to find methods and resources to satisfy the world's energy needs. If proven successful, nuclear fusion turned into a commercially viable energy source could revolutionize how we generate and utilize energy. While we cannot afford to rely on the successful development of nuclear fusion to fuel our future energy needs, it does provide us with vision, hope, and the possibility of clean, renewable energy for centuries to come.

Nuclear fusion is the process of joining the nuclei of two atoms together. All nuclei have positive charges, which naturally and powerfully repel each other. If this strong repulsion is overcome, the nuclei collide together with tremendous energy, forming a tight nuclear bond. The mass of the original two atoms is slightly greater than the mass of the product, which consists of a larger atom plus a light particle. This is due to the fact that a small amount of mass is converted into energy. This is in accordance with the Laws of Thermodynamics and Einstein s equation E=mc2. This famous equation describes the relationship between energy and mass. In essence, it states that energy is equal to mass times the speed of light squared. It is easy to see that a small amount of mass can be converted into an enormous amount of energy. While nuclear fusion reactions are producible, time will tell whether it will ever be commercially viable as an energy source.

Sources

http://www.lenr-canr.org/Introduction.html, accessed November 15, 2004. This Web page entitled Introduction to LENR-CANR provides five introductory essays on LENR and CANR. The information was taken from the essay entitled "Cold Fusion: What is it and what does it mean to science and society?" Edmund Storms, physicist at Los Alamos National Laboratory, was the author of this essay as well as others on this Web page.

Heinberg, Richard, The Party's Over: Oil, War, and the Fate of Industrialized Societies, Gabriola Island, BC: New Society Publishers, 2003, p. 157-160.