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French Newspaper Features Cold Fusion As Nuclear's 'Green' Hope

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By Erick Haehnsen – www.LATRIBUNE.FR

After being criticized for a quarter century, low-temperature nuclear fusion is gaining credibility. Furthermore it promises abundant energy cheap and decentralized, it does not produce hazardous radioactive radiation. Industry, universities, research and startup centers are mobilizing.

In the Occupied TV series Jo Nesbø (broadcast on Arte in France), Russia invaded Norway after the decision of the Prime Minister to end the exploitation of fossil fuels in favor of alternative energy, fueled by thorium, a resource clean, inexhaustible, has huge power and whose name is inspired by Thor, the god of the Vikings. Authorized representative ted by the EU, Russia needed to boost the exploitation of oil and gas in Norway and occupied the country that commits its resistance! In short, the first post COP21 series...

This admirable fiction watch, certainly in a special way, how some states and industrial lobbies are desperate to get its hands on the true blood of the economy: energy. Wars, corruption, misinformation, judgment of fundamental research programs, elimination of competitors ... all means are good. And that's racing! Global energy consumption has doubled between 1973 and 2013, from 6,100 Mtoe (million tonnes of oil equivalent) to 13,541 mtoe, according to a 2015 study by the International Energy Agency (IEA). And, as everyone should know, 81.4% of the energy is of fossil origin, while the objective of the COP21 of "below 2 ° C" warming assumes to leave at least 70% carbon resources into the ground. As for nuclear power, if maligned, this energy is not renewable and potentially dangerous, it weighs only 4.2% of the world total. While renewables are not barely 1.2% of our needs. Of course, with these energies countries,

especially emerging, developing their economies. But at the cost of global warming, peak of urban air pollution and nuclear disasters. Faced with this, physicists, industrial and startups "wet their shirt" to redefine the energy equation fundamental warming. Their idea? Provide energy both abundant, readily available, clean, decentralized and at almost no marginal cost. The challenge is to invent a new discipline of physical science called "low energy nuclear reaction" - Low Energy Nuclear Reaction (LENR). In these next few years, it could generate economic disruption, major social and geopolitical, as it aims to take a dominant share of the energy market, estimated at 7000 billion per year. Explanations.

SCIENTIFIC CONTROVERSY THAT GOES ...

However, this revolution has started badly. It all starts on March 23, 1989. A British researcher, Martin Fleischmann, and an American researcher, Stanley Pons, demonstrate that with electrolysis of heavy water (deuterium) and palladium electrodes, one can obtain a release of heat abnormally large compared to an ordinary chemical reaction. This would be a very specific nuclear fusion reaction as it takes place at ambient temperature (50 ° C to 1500 ° C). Hence the term "cold fusion," as opposed to the merger to several million degrees as seen in the Sun and stars. very unhappy expression! "After the publication of Fleischmann and Pons, the Massachusetts Institute of Technology (MIT) and the California Institute of Technology (Caltech) have tried, unsuccessfully, to replicate the experience. They also prepared and published in the journal Nature article on the famous "cold fusion". All in less than five weeks. The never seen "quips Nicolas Chauvin, co-founder of the Swiss startup LENR Cars SA, a large industry expert based in Ecublens (Switzerland). For his part, former physics lecturer at the University of Aix-Marseille, now an independent researcher retired, Jean-Paul Biberian confirms: "The CNRS forced me to stop my research on cold fusion although they do not cost much, "... especially compared to hot fusion reactor project ITER (16 billion euros) and the landfill of radioactive waste in Bure (25 billion euros). Since then, the methodological problems that prevented to reproduce the experience of Fleischmann and Pons were solved in universities. First in Italy and then in Russia, Ukraine, India, Japan, China, Sweden, UK, Greece and the United States - but not in France. Scalded cat fears cold water, the cold fusion community now prefers to speak of "condensed matter physics", or simply LENR. In twenty-five years, more than a thousand scientific articles have been published in refereed journals. LENR and some processes have even been the subject of technical validations by universities or independent institutions.

MOBILISATION INDUSTRIAL MARKET

Curiously, we still do not explain the reaction of cold fusion. However, we get better and better to control and reproduce. All with abundant raw materials and cheap as nickel, lithium and hydrogen. And without pollution or hazardous radioactive emissions. And that changes everything! According to E-Cat World, a reference site in the LENR community, nearly a hundred organizations in the world is interested in this field. industrial It even counts as Airbus (who filed a patent), Boeing, Mitsubishi Heavy Industry, Renault-Nissan, Shell, Toyota ... The institutions include the Indian Bhabha Atomic Research Centre (Barc) Elforsk (Sweden), the national agency for new technologies, energy and the Italian sustainable economy (Enea), NASA, the US Navy, the Stanford Research Institute (SRI), the Chinese Nuclear Society, the Swedish Defence...

In other words, cold fusion is back in the news. Mainly with the emergence of dozens of US startups like Leonardo Corporation (which raised \$ 62 million), Brilliant Light Power, Brillouin Energy Corporation, Brust Energy, Jet Energy. Japan include Clean Planet, UK, Clean Nuclear Power LLC; Sweden Hydro Fusion; Italy Is Tech, and NicHenergy Prometeon SRL; Switzerland LENR LENR Cars and Cities; Germany, Lightstone and Technologies, Russia, New Inflow ... These young shoots that are in the starting blocks for the first sale LENR reactor. "For twenty-five years, only a few universities have invested in LENR at 5 or 10 million euros a year globally, resumes Nicolas Chauvin who has three LENR reactors for the world of transport. The accelerator coup took place the last three years. In 2014, investments increased from 20 to 30 million euros. Last year 100 million. This year they are expected to reach between 300 and 500 million. "

"The days when people made fun of cold fusion is now over," said Michel Vandenberghe, CEO of the Swiss startup LENR Cities, creating ecosystems to foster the adoption of industrial LENR in the world (see maintenance, above). And discuss the collaboration agreement between Clean Planet Inc. and Research Center for Electron Photon Science of Tohoku University (Japan) - in collaboration with the company Head - which receives public funding of Nedo, the 'Japanese counterpart ADEME. Besides the desire to strengthen basic research in LENR, the Nedo aims to develop by 2018 the energy production process and decontaminate nuclear waste by transmutation of matter. "Mitsubishi has already filed patents on it. When preparing a metal with nano-metallurgy technologies, for example nickel, the material behaves like a sponge to hydrogen. It is matter "condensed", explains Didier Pelluet, DGA SA LENR Cities. By exciting with

electricity, laser or even sound, it produces nuclear transmutation reactions: for example, copper "pushes" and in nickel! No gamma-ray emission [highly radioactive, note]. "

It is on this principle of transmutation that can turn uranium, plutonium or cesium, highly radioactive, lithium, or even lead perfectly harmless. "These phenomena are known but should the energy of a nuclear power plant to achieve it! It was there that the LENR intervene because it could be done at very low temperatures and cheaply," says Didier Pelluet LENR of Cities, which helps set up the Newk project, an ecosystem of 11 companies around the Sellafield company to structure a European industrial sector of the recycling of nuclear waste in Thornton Scientific Park near Chester, UK.

PRODUCTS NEAR READY FOR MARKETING

For now, most projects do not exceed the laboratory stage prototype. However two of them seem close to launch their products on the market. Starting with the company Leonardo Corporation. His LENR reactor, dubbed E-Cat, which uses hydrogen as well as nanostructured powders of nickel and lithium, was designed by the entrepreneur-researcher Andrea Rossi and Sergio Focardi the researcher of the University of Bologna (Italy). In October 2014, E-Cat was the first reactor LENR to be an independent technical validation carried out in particular by researchers at the University of Bologna, the University of Uppsala (Sweden) and the Royal Institute of technology in Stockholm. For thirty-two days, this tiny device 33 cm long and 12 cm reached a temperature of 1260 ° C and 1400 ° C, generated 1.5 MW, or between 3.2 and 3, 6 times more energy than it consumed in. Currently, Andrea Rossi developing a range of E-Cat prototypes, from domestic generator 10 kW to 1 MW the station for industry, already being tested on a site.

Another pioneer, the California Brillouin Energy Corporation has demonstrated, on November 2, its two reactors WET and HHT before members of Congress. "It was an opportunity to show that we are close to commercialization of our products," comments Robert Godes, president and technical director of the company. "Energy efficiency is a factor of 4 [400%, note] and potentially more," says Michael McKrube, director until 2009 of the research center on energy SRI International, which in January 2015 had access to laboratory startup and conducted tests in its own facilities. "This transparency creates a climate of confidence to consider industrialize Brillouin Energy technology," says Michael Halem, CEO of LENR Invest, a Swiss-American fund that also invests in startups LENR Cars, LLC and Lenuco NicHenergy. Still, for now, is that Brillouin

listed AlwaysOn Global 100 "100 companies from Silicon Valley to watch closely." Other hope, the Russian company New Inflow claims to have developed a new scientific theory and mathematical models capable of simulating the LENR. A move that allows him to earn returns of 600% to 800%. ■

About Brillouin Energy

Brillouin Energy is a clean-technology company based in Berkeley, California, which is developing, in collaboration with Stanford Research International (SRI), an ultra-clean, low-cost, renewable energy technology that is capable of producing commercially useful amounts of thermal energy from LENR.

Brillouin Energy's technology includes a proprietary method of electrical stimulation of nickel metal conductors using its unique Q-Pulse™ control system. The process stimulates the system to generate LENR reactions, which generates excess heat. The excess heat produced is a product of hydrogen and a nickel metal lattice. Other than the heat output, there are no (zero) toxic or CO2 emissions of any kind.