



Graduate Seminar (EEL 6936)
Department of Electrical Engineering
http://ee.eng.usf.edu/Grad_Seminar

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University of Florida, Gainesville, FL, USA
Electrical & Computer Engineering

Friday, September 11, 2015, 3:45-4:30 p.m.
Engineering Building II (ENB) Room 109

Electrical Baseloads Coal, Gas, Nuclear and Oil: Which One Do You Choose?

Abstract

There are about a dozen ways to generate electrical power, but four of them stand out as baseload generators that we cannot do without. Coal, gas, nuclear, and oil generate dependable 24/7 electrical energy to large markets that cannot be done with the alternative sources such as wind, solar, hydroelectric, biomass, geothermal, or tidal. This talk will address the serious deficiencies of the current four baseload sources, and recommend recently resurrected alternative nuclear designs, two of which have hardware proven positive features that wipe out the flaws in coal, gas, current nuclear, and oil. The Thorium Reactor, the Integral Fast Reactor (IFR), and Fusion form the alternative nuclear reactor trio. Thorium and IFRs share several positive properties including burning 99% of their fuel with 1% waste, burning their own waste as well as the waste of conventional light water nuclear reactors, and using molten fuel under atmospheric pressure (i.e., no steam explosions). The IFR uses uranium, and that gives an edge to thorium. Thorium is virtually not radioactive, requires no enrichment, and is about 4x more plentiful in the Earth's crust than uranium. The two major hurdles for both designs are: they are disruptive technologies, and public negative reaction to the words "nuclear" and "radiation." This talk assimilates knowledge based on the extensive science and engineering work over the past 70 years.

Biography



Dr. Chuck Hawkins is currently an Adjunct Professor in the ECE Department at the University of Florida following a career at the University of New Mexico. His research and graduate teaching was in IC test engineering, reliability, and failure analysis. He has also worked with the CMOS IC Development Group at Sandia National Lab in New Mexico for 20 years and did on-site research at Intel, AMD, Philips Research Labs, Signetics, and Qualcomm. Dr. Hawkins has taught short courses in Europe, Canada, South America, Australia, Mexico, and China. He recently finished an undergraduate textbook titled, "CMOS Digital Integrated Circuits: A First Course." He also teaches a senior course at UF Gainesville on this topic. A previous book on today's topics was, "CMOS Electronics; How it Works, How it Fails." He was also the Editor of the magazine *Electron Device Failure Analysis*. Dr. Hawkins received his Ph.D. degree from the University of Michigan, an MSEE from Northeastern University, and BEE from the University of Florida.